



North American Energy Standards Board

801 Travis, Suite 1675, Houston, Texas 77002
Phone: (713) 356-0060, Fax: (713) 356-0067, E-mail: naesb@naesb.org
Home Page: www.naesb.org

NORTH AMERICAN ENERGY STANDARDS BOARD RETAIL GAS & ELECTRIC QUADRANTS EXECUTIVE COMMITTEE MEETING MEETING MATERIALS

Wednesday, February 2, 2011 -- 10:00 am to 4:00 pm MT

PERA Club, 1 E. Continental Drive, Tempe, AZ -- Mesquite Hall



North American Energy Standards Board

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NORTH AMERICAN ENERGY STANDARDS BOARD RETAIL QUADRANTS EXECUTIVE COMMITTEE MEETING

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Web Cast and Conference Call, for in person attendance -- PERA Club/Mesquite Hall (first floor of Clubhouse), Tempe, AZ

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	• Comments November 15, 2010	
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	• Late Comments Submitted by Hamilton Consulting on behalf of Southern California Edison: http://www.naesb.org/pdf4/req_120810_sce.doc	967



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	• DSM-EE Subcommittee	
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10.	Board of Directors, Board Committee and Regulatory Updates (no votes or action to be taken):	
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11.	Other Business	1042
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12.	Adjourn	

Attire – Business Casual



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NAESB ANTITRUST GUIDELINES STATEMENT

ANTITRUST GUIDELINES

- The following guidelines will be reviewed by counsel at the meeting. The meeting will be monitored, transcribed, and minutes will be taken. The guidelines are as follows:

Antitrust guidelines direct meeting participants to avoid discussion of topics or behavior that would result in anticompetitive behavior including: restraint of trade and conspiracies to monopolize, unfair or deceptive business acts or practices, price discriminations, division of markets, allocation of production, imposition of boycotts, and exclusive dealing arrangements.

Any views, opinions or positions presented or discussed by meeting participants are the views of the individual meeting participants and their organizations. Any such views, opinions or positions are not the views, positions or opinions of NAESB, the NAESB Board of Directors, or any NAESB Committee or Subcommittee, unless specifically noted otherwise.

As it is not the purpose of the meeting to discuss any antitrust topics, if anyone believes we are straying into improper areas, please let us know and we will redirect the conversation.



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NORTH AMERICAN ENERGY STANDARDS BOARD 2011 EXECUTIVE COMMITTEE TERMS – Wholesale Gas Quadrant

PRODUCERS SEGMENT		TERM END:
Rhonda Denton	Regulatory Affairs, BP Energy Company	12-31-2012
Catherine Abercrombie	Regulatory Affairs, ConocoPhillips Gas and Power Marketing	12-31-2012
Chuck Cook	Manager - Regulatory Affairs, Chevron	12-31-2011
Richard D. Smith	Regulatory & Compliance Manager, Noble Energy, Inc.	12-31-2011
Mike Shepard	General Counsel, Mewbourne Oil Company	12-31-2011
PIPELINE SEGMENT		
Bill Griffith	Consultant, El Paso Natural Gas Company	12-31-2011
Kathryn Burch	Project Manager - Standards and Regulatory, Spectra Energy Transmission	12-31-2011
Dale Davis	Industry Standards Consultant, Williams Gas Pipeline	12-31-2013
Randy Young	Vice President - Regulatory Compliance and Corporate Services, Boardwalk Pipeline Partners, LP	12-31-2012
Kim Van Pelt	Regulatory Compliance Manager, Panhandle Eastern Pipe Line	12-31-2012
LOCAL DISTRIBUTION COMPANY (LDC) SEGMENT		
Rodger Schwecke	Director – Energy Markets and Capacity Products, Sempra Energy - Southern California Gas	12-31-2011
Phil Precht	Management Consultant – Pricing & Regulatory Services Department, Baltimore Gas and Electric Company	12-31-2011
Archie Hickerson	Director - Regulatory Affairs and Planning, AGL Resources	12-31-2013
Mike Novak	Assistant General Manager- Federal Regulatory Affairs, National Fuel Gas Distribution Corporation	12-31-2012
Craig Colombo	Energy Trader III, Dominion Resources	12-31-2012
END USERS SEGMENT		
Norm Spooner	Supply Chain Manager – Fuel & Term Trading Department, Arizona Public Service Company	12-31-2012
Valerie Crockett	Senior Program Manager - Energy Markets & Policy, Tennessee Valley Authority	12-31-2012
Lori-Lynn C. Pennock	Senior Fuel Supply Analyst, Salt River Project	12-31-2011
Simona Patru	Manager Contract Administration – Energy Marketing & Trading, Florida Power & Light	12-31-2011
Tina Burnett	Natural Gas Resources Administrator, The Boeing Company	12-31-2011
SERVICES SEGMENT		
Craig Fleming	Director of Credit, Sequent Energy Management	12-31-2012
Lisa Simpkins	Vice President, Energy Policy – Natural Gas, Constellation Energy Commodities Group	12-31-2012
Leigh Spangler	CEO, Latitude Technologies, Inc.	12-31-2011
Jim Buccigross	Vice President, 8760 Inc.	12-31-2011
Jeff Jarvis	Senior Counsel, EnCana Marketing (USA), Inc.	12-31-2011



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NORTH AMERICAN ENERGY STANDARDS BOARD 2011 EXECUTIVE COMMITTEE TERMS – Retail Electric Quadrant

SERVICE PROVIDERS/SUPPLIERS SEGMENT		TERM END:
Bill Barkas	Manager of Retail State Government Relations, Dominion Retail, Inc.	12-31-2011
Jim Minneman	Controller, PPL Solutions, LLC	12-31-2011
Wendell Miyaji	Vice President – Energy Sciences, Comverge, Inc.	12-31-2012
Susan Munson	ERCOT Retail Market Liaison, Electric Reliability Council of Texas (ERCOT)	12-31-2012
UTILITIES SEGMENT		
Phil Precht	Management Consultant - Pricing and Regulatory Services Department, Baltimore Gas & Electric Company	12-31-2011
Patrick Eynon	Supervisor – Retail Access, Ameren Services	12-31-2011
Judy Ray	Industrial Segment Manager – Contract Administrator, Alabama Power Company	12-31-2012
Michael J. Jesensky	Director – Demand –Side Analysis, Dominion Resources Services, Inc. (representing Dominion Virginia Power)	12-31-2012
END USERS/PUBLIC AGENCIES SEGMENT		
James Bradford Ramsay	General Counsel – Supervisor/Director – NARUC Policy Department, National Association of Regulatory Utility Commissioners (NARUC)	12-31-2011
V A C A N C Y		12-31-2011
Annunciata E. Marino	Utility Energy Policy and Technology Analyst, Pennsylvania Public Utility Commission	12-31-2012
V A C A N C Y		12-31-2012



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NORTH AMERICAN ENERGY STANDARDS BOARD 2011 EXECUTIVE COMMITTEE TERMS – Wholesale Electric Quadrant

TRANSMISSION SEGMENT		TERM END:	SUBSEGMENT:
Patrick McGovern	Manager - System Services, Georgia Transmission Corporation	12-31-2011	Muni/Coop
V A C A N C Y		12-31-2012	Fed/State/Prov.
Corey Sellers	Transmission Service Manager, Southern Company	12-31-2012	IOU
Edward Davis	Policy Consultant, Entergy Services, Inc.	12-31-2011	IOU
Robert Bean	Transmission Services Trading Section Leader, Arizona Public Service Company	12-31-2012	at large
Bob Harshbarger	OASIS Trading Manager, Puget Sound Energy	12-31-2011	at large
Michelle Mizumori	Director of Market – Operations Interface, Western Electricity Coordinating Council (WECC)	12-31-2011	At-Large
GENERATION SEGMENT			
William J. Gallagher	Special Contracts Chief, Vermont Public Power Supply Authority	12-31-2011	Muni/Coop
Kathy York	Senior Program Manager – Energy Markets, Policy, and Compliance Reporting, Tennessee Valley Authority	12-31-2012	Fed/State/Prov.
V A C A N C Y		12-31-2012	IOU
John Ciza	Project Manager Energy Policy and Regulatory Affairs, Southern Company Services	12-31-2011	IOU
Alan Johnson	Director Regulatory Compliance – Commercial Operations & Commodities, NRG Energy, Inc.	12-31-2012	Merchant
V A C A N C Y		12-31-2011	at large
Shah Hossain	Senior Regulatory Specialist, Westar Energy, Inc.	12-31-2011	at large
MARKETERS/BROKERS SEGMENT			
Chris Norton	Director of Market Regulatory Affairs, American Municipal Power, Inc.	12-31-2012	Muni/Coop
Belinda Thornton	General Manager - Energy Origination, Tennessee Valley Authority	12-31-2011	Fed/State/Prov.
V A C A N C Y		12-31-2012	Not IOU Affiliated
Richard Lehman	Supply and Trading, Salt River Project	12-31-2011	at large
John Apperson	Director – Commercial and Trading, PacifiCorp Energy	12-31-2012	IOU
Roy True	Manager of Regulatory and Market Affairs, ACES Power Marketing	12-31-2011	at large
Barry Green	Barry Green Consulting (representing Electric Power Supply Association (EPSA))	12-31-2011	at large



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DISTRIBUTION/LOAD SERVING ENTITIES (LSE) SEGMENT		TERM END:	SUBSEGMENT:
Ray Phillips	Manager of Compliance and Special Projects, Alabama Municipal Electric Authority	12-31-2012	Muni/Coop
Robert (Bob) S. Beadle	Manager – Transmission Resources, North Carolina Electric Membership Corporation	12-31-2011	at large
Alan Pritchard	Senior Engineer, Duke Energy Corporation	12-31-2012	IOU
Rufus D. Gladney	Executive Manager of Energy Services West, Consumers Energy Company	12-31-2011	IOU
Robert Martinko	Consultant FERC Compliance, FirstEnergy Service Company	12-31-2012	at large
Syd Berwager	Industry Restructuring Project Manager, Bonneville Power Administration/Power Business Line	12-31-2011	Other
Andy Rodriquez	Director of Standards Development, North American Electric Reliability Corporation (NERC)	12-31-2011	At-Large
END USERS SEGMENT			
V A C A N C Y		12-31-2011	at large
Aaron Breidenbaugh	Senior Manager - Regulatory Affairs and Public Policy - New York, EnerNOC, Inc.	12-31-2012	at large
Lou Ann Westerfield	Policy Strategist, Idaho Public Utilities Commission, rep. National Association of Regulatory Utility Commissioners	12-31-2012	Regulator
V A C A N C Y		12-31-2011	at large
Jesse D. Hurley	Chief Executive Officer, Shift Research, LLC	12-31-2012	at large
V A C A N C Y		12-31-2011	at large
Paul Sorenson	Vice President - Central Markets Strategy, Open Access Technology International, Inc.	12-31-2011	At-Large
INDEPENDENT GRID OPERATORS/PLANNERS			
Thomas Bowe	Executive Director – Reliability Integration, PJM Interconnection, LLC	12-31-2012	
Jim Castle	Manager - Grid Operations, New York Independent System Operator, Inc.	12-31-2012	
Matt Goldberg	Director Reliability & Operations Compliance ISO New England, Inc.	12-31-2012	
Nancy Traweek	Director – Market Services, California ISO	12-31-2012	
Joel Mickey	Director of Grid Operations, Electric Reliability Council of Texas	12-31-2011	
Ed Skiba	Consulting Advisor, Standards Compliance & Strategy, Midwest ISO	12-31-2011	
Charles Yeung	Executive Director Interregional Affairs, Southwest Power Pool	12-31-2011	



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TECHNOLOGY AND SERVICES

Jim Buccigross	Vice President Energy Industry Practice, 8760 Inc.	12-31-2012
Andy Tritch	Senior Business Analyst, SunGard	12-31-2012
V A C A N C Y		12-31-2012
V A C A N C Y		12-31-2012
V A C A N C Y		12-31-2011
V A C A N C Y		12-31-2011
V A C A N C Y		12-31-2011



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NORTH AMERICAN ENERGY STANDARDS BOARD 2011 EXECUTIVE COMMITTEE TERMS – Retail Gas Quadrant

SERVICE PROVIDERS/SUPPLIERS SEGMENT		TERM END:
Dwight M. Whitley, Jr.	Corporate Counsel, Sierra Southwest Cooperative Services, Inc.	12-31-2011
V A C A N C Y		12-31-2011
Richard Zollars	Director - Data and Billing, Dominion Retail, Inc.	12-31-2012
V A C A N C Y		12-31-2012
DISTRIBUTORS SEGMENT		
Dan Jones	Supervisor - Certified Supplier Business Center, Duke Energy	12-31-2011
Julie Compton Pellizzi	Project Leader, AGL Resources, Inc.	12-31-2011
Michael Novak	Assistant General Manager – Federal Regulatory Affairs, National Fuel Gas Distribution Corporation	12-31-2012
V A C A N C Y		12-31-2012
END USERS/PUBLIC AGENCIES SEGMENT		
V A C A N C Y		12-31-2012
V A C A N C Y		12-31-2012
V A C A N C Y		12-31-2011
V A C A N C Y		12-31-2011



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NORTH AMERICAN ENERGY STANDARDS BOARD 2011 EXECUTIVE COMMITTEE ALTERNATES – Wholesale Gas Quadrant

PRODUCER SEGMENT

PIPELINE SEGMENT

Bill Grygar	Vice President, Panhandle Eastern Pipe Line
Scott Hansen	Questar Pipeline Company
Ronald G. Tomlinson	Manager – Business Technology, Dominion Gas Transmission, Inc.
Paul Love	Director, Electronic Customer Services, Natural Gas Pipe Line Company of America
Mark Gracey	Consultant, Tennessee Gas Pipeline Company
Christopher Burden	Consultant e-Commerce & Service Delivery, Williams Gas Pipeline
Tom Gwilliam	Iroquois Gas Transmission System

LOCAL DISTRIBUTION COMPANY (LDC) SEGMENT

Rick Ishikawa	Interconnect Account Manager in Capacity Products Group, Southern California Gas Company
Jim Blasiak	Specialist Federal Regulatory Affairs, Washington Gas Light Company
George Simmons	FERC Specialist, NiSource Inc.
Shannon Pierce	Senior Counsel – Interstate Transactions and Gas Operations, AGL Resources
Scott Butler	Project Manager, Energy Markets Policy Group, Consolidated Edison Company of New York, Inc.

END USER SEGMENT

Paul A. Jones	Senior Marketing Representative, Salt River Project
Art Morris	Gas Originator, Florida Power & Light Company
Kenneth Nordlander	Fuel Procurement, Arizona Public Service Company

SERVICES SEGMENT

Keith Sappenfield	Director, US Regulatory Affairs, Midstream and Marketing, EnCana Oil and Gas (USA), Inc.
Sylvia Munson	Director – Product Management and Regulatory Compliance, SunGard Energy and Commodities



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NORTH AMERICAN ENERGY STANDARDS BOARD 2011 EXECUTIVE COMMITTEE ALTERNATES – Retail Electric Quadrant

SERVICE PROVIDERS/SUPPLIERS SEGMENT

Brandon S. Siegel	Manager – Market Management, E:SO
H. Neal Allen	Profitability & Economic Analysis Manager, Southern Company Services

UTILITIES SEGMENT

Keith P. Hock	Director ARES Business Center, Ameren Services Company
Debbie McKeever	Market Advocate, Oncor
William J. Welzant	Principal Supplier Services Analyst, Supplier Account Management, Baltimore Gas and Electric

END USERS/PUBLIC AGENCIES SEGMENT



North American Energy Standards Board

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NORTH AMERICAN ENERGY STANDARDS BOARD 2011 EXECUTIVE COMMITTEE ALTERNATES – Wholesale Electric Quadrant

TRANSMISSION SEGMENT		SUB-SEGMENT
Abbey J. Nulph	Senior Public Utilities Specialist, Bonneville Power Administration	Fed/State/Prov.
Chuck Feagans	Tennessee Valley Authority	Fed/State/Prov.
Sarah E. Edmonds	Director of Transmission Regulation, Strategy and Policy, PacifiCorp	IOU
Jane Daly	Rate & Regulatory Advisor, Arizona Public Service Company	IOU
Lori Molotch	Transmission Services Trader Senior, Arizona Public Service Company	IOU
Narinder Saini	Policy Consultant, Entergy Services, Inc.	IOU
J.T. Wood	Southern Company Services	IOU
Joshua Jenkins	Sr. Engineer – Transmission Policy and Services, Southern Company Services	IOU
Hasnah Mat-Amin	Market Interface Manager, Western Electricity Coordinating Council	At Large
Ross Kovacs	Transmission Strategic Coordinator, Georgia Transmission Corporation	Muni/Coop
GENERATION SEGMENT		SUB-SEGMENT
Lou Oberski	Director – Electric Market Policy, Dominion Resources Services, Inc	IOU
Francis Halpin	Bonneville Power Administration	Fed/State/Prov.
MARKETER/BROKER SEGMENT		SUB-SEGMENT
Jeff Ackerman	Manager, CRSP-Energy Mgmt., Western Area Power Administration	Fed/State/Prov
Brenda Anderson	Bonneville Power Administration	Fed/State/Prov
Valerie Crockett	Senior Program Manager, Energy Markets & Policy, Tennessee Valley Authority	Fed/State/Prov
Joel Dison	Project Manager, Southern Company Generation and Energy Marketing	IOU
DISTRIBUTION/LSE SEGMENT		SUB-SEGMENT
Gerry Adamski	Vice President of Standards, NERC	At-Large
Lee Hall	Coordination Manager – Power Services, Bonneville Power Administration	Other
James R. Manning	Senior Engineer – Transmission Resources, North Carolina Electric Membership Corporation	Muni/Coop
Ronald C. Snead	General Manager, System Planning and Business Services, Duke Energy	IOU



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END USER SEGMENT		SUB-SEGMENT
Mark W. Hackney	Regional Director – Transmission, Open Access Technology International, Inc.	At-Large
INDEPENDENT GRID OPERATORS/PLANNERS SEGMENT		SUB-SEGMENT
Paul Wattles	Supervisor Demand Side Programs, Electric Reliability Council of Texas (ERCOT)	
Bill Blevins	Sr. Market Support Analyst, Electric Reliability Council of Texas (ERCOT)	
Heather Sanders	Renewable Integration Support Manager, California ISO	
Robert Coughlin	Principal Scientist Reliability & Operations Compliance, ISO New England, Inc.	
Eric Winkler	Project Manager – FCM and Tariff Administration, ISO New England, Inc.	
Cheryl Mendrala	Principal Engineer, ISO New England, Inc.	
Jason Marshall	Technical Manager, Midwest ISO	
Marie Knox	Sr. Standards Compliance Analyst, Midwest ISO	
Dean Hartung	Manager Real Time Market Operations, PJM Interconnection, LLC	
Cathy Wesley	Sr. Analyst, PJM Interconnection, LLC	
Carl Monroe	Sr. Vice President Operations & Chief Operating Officer, Southwest Power Pool	
Greg Campoli	Supervisor – Reliability Compliance and Assessment, New York ISO	
Diana Pommen	Director Interjurisdictional Affairs, Alberta Electric System Operator	
Jimmy Womack	Manager-Tariff Administration, Southwest Power Pool	
Terry Bilke	Director Standards Compliance and Strategy, Midwest ISO	
TECHNOLOGY AND SERVICES		SUB-SEGMENT



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NORTH AMERICAN ENERGY STANDARDS BOARD 2011 EXECUTIVE COMMITTEE ALTERNATES – Retail Gas Quadrant

SERVICE PROVIDERS/SUPPLIERS SEGMENT

Paul Cherevka	Project Manager Data Warehouse, Dominion Retail

DISTRIBUTORS SEGMENT

Joe Stengel	Manager, Federal Regulatory Affairs, Philadelphia Gas Works

END USERS/PUBLIC AGENCIES SEGMENT



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January 14, 2011

TO: NAESB Quadrant Executive Committee Members, Alternates and Interested Industry Participants
FROM: Rae McQuade, NAESB President
RE: Quadrant Executive Committee Meeting Announcements and Draft Agendas with links to Meeting Materials - **Revised with Additional Links to Materials**

NORTH AMERICAN ENERGY STANDARDS BOARD EXECUTIVE COMMITTEE MEETINGS Hosted by Salt River Project in Phoenix, AZ

First, let me thank SRP for its generosity and commitment to the NAESB organization through hosting this series of meetings. Without such support, it would be very difficult to maintain the NAESB budget and provide various locations around the country to NAESB in-person attendance meetings.

As we have announced at prior Executive Committee meetings, meeting announcements and in other communications, the Executive Committee (EC) will meet in Phoenix, AZ hosted by Salt River Project. Below are the meeting arrangements:

Where: PERA Club: 1 E. Continental Drive, Tempe, AZ 85281-1053
Contact: Veronica Thomason, 713-356-0060
When: Tuesday, February 1 -- 10:00 a.m. to 4:00 p.m. Mountain – Wholesale Electric Quadrant
Wednesday, February 2 -- 10:00 a.m. to 4:00 p.m. Mountain – Retail Gas Quadrant and Retail Electric Quadrant
Thursday, February 3 -- 9:00 a.m. to 3:00 p.m. Mountain – Wholesale Gas Quadrant

If you plan to attend any of the above EC meetings and have not already RSVPed to our office through the other announcements, please do so at your earliest convenience to the NAESB office (naesb@naesb.org) so that proper meeting arrangements can be made by NAESB and our host.¹ Travel information is posted on the NAESB web site on the EC pages and can be directly accessed from the following link: http://www.naesb.org/weq/weq_ec.asp. If you plan to participate by conference call, the information to do so is provided in this document. The EC meetings will be web cast as well. The meeting, conference calling and web casting is open to any interested party.

The materials for the meeting will be emailed to the participants and posted on the web site shortly. In an effort to control costs and be more environmentally aware, we are not printing Executive Committee books any longer although they will be posted in an assembled pdf document for each quadrant meeting, in addition to the links to the native formatted documents provided in the agendas. For agenda items where materials are already available and have been sent to you in prior communications, or posted on the web site, the links to those documents are included in the agenda for your convenience, and to help you prepare for the meetings. The links are formatted in blue underlined text. As the meeting approaches, this agenda with additional links to documents will be provided, along with the pdf assembled books.

Please note that in discussions with the Retail Quadrants EC chairs and vice chairs, it has been determined that all Retail EC meetings for 2011 will be conference call/web casts in recognition of the small number of in-person attendance from the 2009-2010 records, and also in recognition of the reduced travel budgets for 2011 of many of the Retail EC members. However, since NAESB staff will be on location to provide support for the retail EC meetings, any Retail EC participant may choose to join the staff and participate in-person.

As always, the chair reserves the right to extend the time of the meeting to ensure that agenda items are addressed. The times indicated on the agenda will be followed to ensure that agenda items are allotted appropriate time slots. Should an agenda item conclude earlier than its stated time slot, the remaining time could be allotted to other agenda items at the discretion of the chair.

¹ If you will require WIFI access while in the meeting at the PERA Club, please contact Lori Lynn Pennock (lori-lynn.pennock@srpnet.com or 602-236-4360) with your name, company, email address, and the dates WIFI is requested no later than January 25 to avoid connection delays. Access will be granted after individual user IDs and passwords are created.



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There are other NAESB subcommittee meetings being held in conjunction with the EC meetings. They are held in various locations, and available via conference call and web cast, and upon advance request² for WGQ Joint IR/Technical subcommittee meetings. The details are:

Date	Time	Meeting/Location
Mon Jan 31	10 am to 3 pm M	Day 1 of Retail BPS Meeting/PERA Club/Centennial Conference Center (labeled "Board Room" west of Clubhouse) Conference Call Number: 866-740-1260 Access Code: 7133560 Security Code: 4698 Web Cast: http://www.readytalk.com (please use same codes)
Tues Feb 1	9 am to 3 pm M	Day 2 of Retail BPS Meeting/PERA Club/Centennial Conference Center (labeled "Board Room" west of Clubhouse) Conference Call Number: 866-740-1260 Access Code: 7133560 Security Code: 4698 Web Cast: http://www.readytalk.com (please use same codes)
	10 am to 4 pm M	WEQ EC Meeting/PERA Club/Mesquite Hall (first floor of Clubhouse) Conference Call Number: 866-740-1260 Access Code: 7133562 Security Code: 2843 Web Cast: http://www.readytalk.com (please use same codes)
	9 am to 4 pm M	Day 1 of WGQ Joint IR & Technical//PERA Club/Big Horn Terrace (labeled "BHT" south of Clubhouse) No conference calling requested
Wed Feb 2	10 am to 4 pm M	Retail EC Meeting by phone/web cast/ for in person attendance, please join NAESB staff at PERA Club/Mesquite Hall (first floor of Clubhouse) Conference Call Number: 866-740-1260 Access Code: :7133562 Security Code: 6862 Web Cast: http://www.readytalk.com (please use same codes)
	9 am to 4 pm M	Day 2 of WGQ Joint IR & Technical//PERA Club/Big Horn Terrace (labeled "BHT" south of Clubhouse) No conference calling requested

² To set up phone call in capability for the WGQ IR/Technical meetings requires request from attendees unable to participate in person.



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Date	Time	Meeting/Location
	8 am to 4 pm M	Day 1 of WEQ OASIS Subcommittee/PERA Club/Centennial Conference Center (labeled "Board Room" west of Clubhouse) Conference Call Number: 866-740-1260 Access Code: : 7133560 Security Code: 2695 Web Cast: http://www.readytalk.com (please use same codes)
Thu Feb 3	9 am to 3 pm M	WGQ EC Meeting/PERA Club/Mesquite Hall (first floor of Clubhouse) Conference Call Number: 866-740-1260 Access Code: :7133562 Security Code: 8724 Web Cast: http://www.readytalk.com (please use same codes)
	8 am to 4 pm M	Day 2 of WEQ OASIS Subcommittee/PERA Club/Centennial Conference Center (labeled "Board Room" west of Clubhouse) Conference Call Number: 866-740-1260 Access Code: : 7133560 Security Code: 2695 Web Cast: http://www.readytalk.com (please use same codes)

You can access the materials for this meeting from the NAESB web site, at the page specific for the subcommittee noted (WEQ: <http://www.naesb.org/weq/default.asp>, WGQ: <http://www.naesb.org/wgq/default.asp>, and Retail: <http://www.naesb.org/RGQ/default.asp>).

Please feel free to call the NAESB office should you have any questions or comments.

Best Regards, *Rae*



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CONFERENCE CALLING AND WEB CONFERENCING INSTRUCTIONS

FOR THE EXECUTIVE COMMITTEE AND RELATED SUBCOMMITTEE MEETINGS

This conference call, as all NAESB meetings and conference calls, is open to any interested party.

To join the conference call:

- Dial the 11-digit toll free phone number (provided in the preceding chart – specific to the meeting and date)
- An automated attendant will ask you to enter a seven-digit access code (provided in the preceding chart – specific to the meeting and date)
- The automated attendant will ask you to record your name.
- Please note, if the conference leader has not yet initiated the conference call, you will be placed on hold until the conference leader starts the conference.
- The automated attendant will then ask you for a four-digit security code (provided in the preceding chart – specific to the meeting and date)

Please place your phone on mute unless you are speaking. For those participants that do not have a mute feature on your phone, please press (*6) to mute your phone and (*7) to un-mute your phone. Putting the conference call on hold may cause music to be played over the discussion and if so, the NAESB office will contact the conference call administrator to have the line disconnected.

To join the web conference, go to www.readytalk.com and enter the same access code and security code. Please note that if the conference leader has not yet initiated the web conference, you will view a screen that states, “The Chairperson has not yet arrived. Please standby for your web conference to begin.”

ReadyTalk recommends that you test your browser and network connections for compatibility prior to participating in a web conference. To do so, go to <http://test.callinfo.com>. If you have problems joining a conference call or need technical assistance, please contact ReadyTalk Customer Care, 1-800-843-9166. Please contact the NAESB Office (713-356-0060 or naesb@naesb.org) should you need any additional information or have questions or comments.



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NORTH AMERICAN ENERGY STANDARDS BOARD EXECUTIVE COMMITTEE MEETING WHOLESALE ELECTRIC QUADRANT DRAFT AGENDA

Tuesday, February 1, 2011 – 10:00 am to 4:00 pm M
PERA Club/Mesquite Hall (first floor of Clubhouse), Tempe, AZ

#	Agenda Item
1.	Welcome - Antitrust Guidelines http://www.naesb.org/misc/antitrust_guidance.doc - Welcome to members and attendees - Quorum Establishment: Roll Call of WEQ EC Members and Alternates: http://www.naesb.org/pdf4/ec_terms.pdf (EC) and http://www.naesb.org/pdf4/alt_ec_members.pdf (EC Alt)
2.	Consent Agenda (simple majority to approve) - Adoption of WEQ Agenda (simple majority) http://www.naesb.org/pdf4/ec020111a.doc - Adoption of the WEQ EC Meeting Minutes: - October 26, 2010: http://www.naesb.org/pdf4/weq_ec102610dm.doc, proposed redline changes submitted by E. Skiba, Midwest ISO: http://www.naesb.org/pdf4/weq_ec020111w4.doc - October 22, 2010: http://www.naesb.org/pdf4/weq_req_ec102210dm.doc, proposed redline changes submitted by E. Skiba, Midwest ISO: http://www.naesb.org/pdf4/weq_req_ec020111w1.doc - August 17, 2010: http://www.naesb.org/pdf4/weq_ec081710dm.doc, proposed redline changes submitted by E. Skiba, Midwest ISO: http://www.naesb.org/pdf4/weq_ec020111w5.doc - Adoption of changes to the 2011 Annual Plan to be proposed to the Board of Directors: http://www.naesb.org/pdf4/weq_ec020111w7.doc (redlined changes submitted by WEQ Leadership)
3.	Review and consider for vote WEQ 2010 Annual Plan Item 6a – Phase 2 Requirements Specifications for Common Electricity Product and Pricing Definition – NIST PAP03 – (super majority vote) - Recommendation: http://www.naesb.org/pdf4/weq_2010_ap6a_rec_101510.doc - Formal Comment Period ended November 15, 2010: - Comments Submitted by the NAESB Standards Review Subcommittee: http://www.naesb.org/pdf4/weq_111510_weq_srs.doc - Comments Submitted by the R. Sahib, CAISO: http://www.naesb.org/pdf4/weq_111510_caiso.doc - Comments Submitted by S. Dinges, Trane-Ingersoll Rand (Phase 2 - PAP03): http://www.naesb.org/pdf4/weq_111510_trane_ingersollrand_6a.xls - REQ and WEQ Comments Submitted by S. Dinges, Trane-IngersollRand (Terms): http://www.naesb.org/pdf4/req_weq_111510_trane_ingersollrand_terms.xls - WEQ Comments Submitted by California ISO, ERCOT, IESO, ISO New England, Midwest ISO, New York ISO, PJM and SPP (Phase 2 - PAP03, PAP04, PAP09 and Data Requirements): http://www.naesb.org/pdf4/weq_111510_iso_rto.doc - Comments Submitted by L. Tillman on behalf of Southern Companies (Phase 2 - PAP03): http://www.naesb.org/pdf4/weq_111510_southernco_6a.doc - Comments Submitted by W. Cox, Cox Software Architects LLC (REQ and WEQ Phase 2 - PAP03, PAP04, PAP09 and Data Requirements): http://www.naesb.org/pdf4/req_weq_111510_cox.xls - Late Comments on WEQ PAP 03 Submitted by D. Pratt, J. Phillips and B. Bartell: http://www.naesb.org/pdf4/weq_111510_pratt_phillips_bartell_3_late.doc



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NORTH AMERICAN ENERGY STANDARDS BOARD EXECUTIVE COMMITTEE MEETING WHOLESALE ELECTRIC QUADRANT DRAFT AGENDA

Tuesday, February 1, 2011 – 10:00 am to 4:00 pm M
PERA Club/Mesquite Hall (first floor of Clubhouse), Tempe, AZ

#	Agenda Item
4.	Review and consider for vote on WEQ 2010 Annual Plan Item 6b – Phase 2 Requirements Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04 – (super-majority vote) • Recommendation: http://www.naesb.org/pdf4/weq_2010_ap6b_rec_101510.doc • Comments November 15, 2010: • Comments Submitted by the NAESB Standards Review Subcommittee: see agenda item 3 • Comments Submitted by the R. Sahib, CAISO: see agenda item 3 • WEQ Comments Submitted by S. Dinges, Trane-IngersollRand (Phase 2 - PAP04): http://www.naesb.org/pdf4/weq_111510_trane_ingersollrand_6b.xls • REQ and WEQ Comments Submitted by S. Dinges, Trane-IngersollRand (Terms): see agenda item 3 • WEQ Comments Submitted by California ISO, ERCOT, IESO, ISO New England, Midwest ISO, New York ISO, PJM and SPP (Phase 2 - PAP03, PAP04, PAP09 and Data Requirements): see agenda item 3 • WEQ Comments Submitted by L. Tillman on behalf of Southern Companies (Phase 2 – PAP04): http://www.naesb.org/pdf4/weq_111510_southernco_6b.doc • Comments Submitted by W. Cox, Cox Software Architects LLC (REQ and WEQ Phase 2 - PAP03, PAP04, PAP09 and Data Requirements): see agenda item 3 • Late Comments on (WEQ) PAP 04 Submitted by D. Pratt, J. Phillips and B. Bartell: http://www.naesb.org/pdf4/weq_111510_pratt_phillips_bartell_4_late.doc
5.	Review and consider for vote WEQ 2010 Annual Plan Item 6 – Master Data Requirements for Standards Associated with NIST PAP03 and PAP09 (super majority vote) • Recommendation: http://www.naesb.org/pdf4/weq_2010_ap6_rec_101510.doc • Comments Due November 15, 2010: • Comments Submitted by the NAESB Standards Review Subcommittee: see agenda item 3 • Comments Submitted by R. Sahib, CAISO: see agenda item 3 • REQ and WEQ Comments Submitted by S. Dinges, Trane-Ingersoll Rand (Terms): see above agenda item 3 • WEQ Comments Submitted by California ISO, ERCOT, IESO, ISO New England, Midwest ISO, New York ISO, PJM and SPP (Phase 2 - PAP03, PAP04, PAP09 and Data Requirements): see agenda item 3 • WEQ Comments Submitted by L. Tillman on behalf of Southern Companies (Phase 2 - Data Requirements): http://www.naesb.org/pdf4/weq_111510_southernco_6.doc • Comments Submitted by W. Cox, Cox Software Architects LLC (REQ and WEQ Phase 2 - PAP03, PAP04, PAP09 and Data Requirements): see above agenda item 3 • Late Comments on Data Requirements Submitted by D. Pratt, J. Phillips and B. Bartell: http://www.naesb.org/pdf4/weq_111510_pratt_phillips_bartell_data_requirements_late.doc



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NORTH AMERICAN ENERGY STANDARDS BOARD EXECUTIVE COMMITTEE MEETING WHOLESALE ELECTRIC QUADRANT DRAFT AGENDA

Tuesday, February 1, 2011 – 10:00 am to 4:00 pm M
PERA Club/Mesquite Hall (first floor of Clubhouse), Tempe, AZ

#	Agenda Item
6.	Review and consider for vote WEQ 2010 Annual Plan Item 6c – Phase 2 Requirements Specifications for Wholesale Standard DR Signals - for NIST PAP09 (super majority vote) • Recommendation Redlined: http://www.naesb.org/pdf4/weq_2010_ap_6c_rec_101510_redline.pdf • Recommendation Clean: http://www.naesb.org/pdf4/weq_2010_ap_6c_rec_101510_clean.doc • Comments Due November 15, 2010: • Comments Submitted by the NAESB Standards Review Subcommittee: see agenda item 3 • Comments Submitted by R. Sahib, CAISO: see above agenda item 3 • REQ and WEQ Comments Submitted by S. Dinges, Trane-Ingersoll Rand (Terms): see above agenda item 3 • WEQ Comments Submitted by California ISO, ERCOT, IESO, ISO New England, Midwest ISO, New York ISO, PJM and SPP (Phase 2 - PAP03, PAP04, PAP09 and Data Requirements): see above agenda item 3 • WEQ Comments Submitted by L. Tillman on behalf of Southern Companies (Phase 2 - PAP09): http://www.naesb.org/pdf4/weq_111510_southernco_6c.doc • Comments Submitted by W. Cox, Cox Software Architects LLC (REQ and WEQ Phase 2 - PAP03, PAP04, PAP 09 and Data Requirements): see above agenda item 3 • Late Comments on (WEQ) PAP 09 Submitted by D. Pratt, J. Phillips and B. Bartell: http://www.naesb.org/pdf4/weq_111510_pratt_phillips_bartell_9_late.doc
7.	Review WEQ 2010 Annual Plan Item 4d – Business Practice Standards for Measurement Verification of Energy Efficiency Products (super majority vote, vote will be taken at a subsequent meeting after comments have been considered) • Recommendation Redlined: http://www.naesb.org/pdf4/weq_2010_api_4d_rec_redline.doc • Recommendation Clean: http://www.naesb.org/pdf4/weq_2010_api_4d_rec_clean.doc • Comments Due January 14, 2010: • Comments Submitted by the WEQ Standards Review Subcommittee: http://www.naesb.org/pdf4/weq_120810_weqsrs_4d_memo.doc, Suggested Redline Changes: http://www.naesb.org/pdf4/weq_120810_weqsrs_4d.doc • Comments Submitted by C. Wesley on behalf of the ISO/RTOs – ERCOT, IESO, ISO-NE, Midwest ISO, NYISO, PJM, SPP, CASIO: http://www.naesb.org/pdf4/weq_120810_iso_rtos_4d.doc, Recommendation Redlines: http://www.naesb.org/pdf4/weq_120810_iso_rtos_4d_redline.doc • Comments Submitted by A. Breidenbaugh, EnerNOC, Inc.: http://www.naesb.org/pdf4/weq_120810_enernoc.pdf • Late Comments Submitted by Hamilton Consulting on behalf of Southern California Edison: http://www.naesb.org/pdf4/weq_120810_sce_4d_late.doc • Late Comments Submitted by G. Fry, Northeast Utilities: http://www.naesb.org/pdf4/weq_011411_northeast_utilities_late.doc



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NORTH AMERICAN ENERGY STANDARDS BOARD EXECUTIVE COMMITTEE MEETING WHOLESALE ELECTRIC QUADRANT DRAFT AGENDA

Tuesday, February 1, 2011 – 10:00 am to 4:00 pm M
PERA Club/Mesquite Hall (first floor of Clubhouse), Tempe, AZ

#	Agenda Item
8.	Review and consider for vote WEQ 2010 Annual Plan Items 4a and 4b – Review and develop business practice standards to support DR and DSM-EE programs (DR Phase 2) (super majority vote) • Recommendation Redlined: http://www.naesb.org/pdf4/weq_2010_api_4a_4b_rec_redline.doc • Recommendation Clean: http://www.naesb.org/pdf4/weq_2010_api_4a_4b_rec_clean.doc • Comments Due January 14, 2010: • Comments Submitted by G. Fry, Northeast Utilities: http://www.naesb.org/pdf4/weq_011411_northeast_utilities.doc • Comments Submitted by B. Sailors, Duke Energy: http://www.naesb.org/pdf4/weq_120810_duke_energy.doc • Comments Submitted by the WEQ Standards Review Subcommittee: http://www.naesb.org/pdf4/weq_120810_weqsrs_4a4b_memo.doc, Suggested Redline Changes: http://www.naesb.org/pdf4/weq_120810_weqsrs_4a4b.doc • Comments Submitted by C. Wesley on behalf of the ISO/RTOs – ERCOT, IESO, ISO-NE, Midwest ISO, NYISO, PJM, SPP, CASIO: http://www.naesb.org/pdf4/weq_120810_iso_rtos_4a4b.doc • Comments Submitted by A. Breidenbaugh, EnerNOC, Inc.: see above agenda item 7 • Comments Submitted by M. Pieniazek, Energy Curtailment Specialists, Inc.: http://www.naesb.org/pdf4/weq_120810_ecs_4a4b.pdf • Late Comments Submitted by Hamilton Consulting on behalf of Southern California Edison: http://www.naesb.org/pdf4/weq_120810_sce_4a4b_late.doc • Late Comments Submitted by G. Fry, Northeast Utilities: http://www.naesb.org/pdf4/weq_011411_northeast_utilities_late.doc • Late Comments Submitted by the Wholesale Demand Response Working Group: http://www.naesb.org/pdf4/weq_011411_dsmee_group3_late.doc
9.	Subcommittee Updates (meeting materials for updates will be provided by leadership as they are available): • Triage Subcommittee: http://www.naesb.org/pdf4/tr110910disposition.doc (report), http://www.naesb.org/pdf4/tr011911agenda.doc (new requests), http://www.naesb.org/pdf4/tr011911agenda_revised.doc (revised - new requests) • Business Practices Subcommittee (BPS): http://www.naesb.org/pdf4/weq_ec020111w6.ppt (presentation) • DSM-EE Subcommittee • OASIS Subcommittee • Joint Electric Scheduling Subcommittee (JESS) • Standards Review Subcommittee (SRS): http://www.naesb.org/pdf4/weq_ec020111w1.doc (scope of work-clean); http://www.naesb.org/pdf4/weq_ec020111w2.doc (scope of work-redline), http://www.naesb.org/pdf4/weq_ec020111w3.ppt (presentation) • Glossary Efforts • Smart Grid Standards Development Subcommittee, Smart Grid PAP 10 Subcommittee, Smart Grid Energy Services Provider Interface Task Force



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NORTH AMERICAN ENERGY STANDARDS BOARD EXECUTIVE COMMITTEE MEETING WHOLESALE ELECTRIC QUADRANT DRAFT AGENDA

Tuesday, February 1, 2011 – 10:00 am to 4:00 pm M
PERA Club/Mesquite Hall (first floor of Clubhouse), Tempe, AZ

#	Agenda Item

10. Publication Schedule Review:

- WGQ Publication Schedule (Version 2.0): http://www.naesb.org/misc/wgq_publication_schedule_ver2_0.doc,
- WGQ Publication Schedule (Version 2.1): http://www.naesb.org/misc/wgq_publication_schedule_ver2_1.doc,
- WEQ Publication Schedule (Version 2.2): http://www.naesb.org/misc/weq_publication_schedule_ver2_2.doc,
- Retail Publication Schedule (Version 1.3): http://www.naesb.org/misc/retail_publication_schedule_ver1_3.doc,
- Retail Publication Schedule (Version 1.4): http://www.naesb.org/misc/retail_publication_schedule_ver1_4.doc
(Retail and WGQ provided for context)

11. Board of Directors, Board Committee and Regulatory Updates (no votes or action to be taken):

- Board and Board Committee Updates – Board Meeting December 9, 2010:
<http://www.naesb.org/pdf4/bd120910dm.doc>
- Wholesale Gas and Retail key activities – WGQ Annual Plan, Retail Annual Plan
http://www.naesb.org/pdf4/wgq_2011_annual_plan.doc (WGQ),
http://www.naesb.org/pdf4/retail_ec020211w2.doc (Retail with redlined changes submitted by Retail Leadership)
- Regulatory Updates
- EIR Registry Development Updates

12. Other Business

- 2011 Schedule: http://www.naesb.org/misc/2011_schedule.pdf

Adjourn

Attire – Business Casual



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NORTH AMERICAN ENERGY STANDARDS BOARD EXECUTIVE COMMITTEE MEETING RETAIL QUADRANTS DRAFT AGENDA

Wednesday, February 2, 2011 – 10:00 am to 4:00 pm M

Web Cast and Conference Call, for in person attendance – PERA Club, Tempe, AZ

#	Agenda Item
1.	Welcome • Antitrust Guidelines http://www.naesb.org/misc/antitrust_guidance.doc (Guidance) • Welcome to members and attendees • Quorum Establishment: Roll Call of Retail EC Members and Alternates: http://www.naesb.org/pdf4/ec_terms.pdf (EC) and http://www.naesb.org/pdf4/alt_ec_members.pdf (EC Alt)
2.	Consent Agenda (simple majority to approve) • Adoption of Retail Agenda (simple majority) http://www.naesb.org/pdf4/ec020111a.doc • Adoption of the Retail ECs Meeting Minutes: • October 27, 2010: http://www.naesb.org/pdf4/retail_ec102710dm.doc • October 22, 2010: http://www.naesb.org/pdf4/weq_req_ec102210dm.doc, proposed redline changes submitted by E. Skiba, Midwest ISO: http://www.naesb.org/pdf4/weq_req_ec020111w1.doc • Adoption of changes to the 2011 Annual Plan to be proposed to the Board of Directors: http://www.naesb.org/pdf4/retail_ec020211w2.doc (redlined changes submitted by Retail Leadership)
3.	Review and consider for vote Retail 2010 Annual Plan Item 9a – Requirements Specifications for Common Electricity Product and Pricing Definition – NIST PAP03 – (super majority vote) • Recommendation: http://www.naesb.org/pdf4/retail_2010_ap9a_rec_101510.doc • Formal Comment Period ended November 15, 2010: • Comments Submitted by the B. Bartell, Xtensible Solutions (Phase 2 - PAP03, PAP04, PAP09): http://www.naesb.org/pdf4/req_111510_xtensible_solutions.doc • Comments Submitted by P. Precht, BGE (Phase 2 - PAP03): http://www.naesb.org/pdf4/req_111510_bge_9a.doc • REQ Comments Submitted by S. Dinges, Trane-IngersollRand (Phase 2 - PAP03): http://www.naesb.org/pdf4/req_111510_trane_ingersollrand_9a.xls • REQ and WEQ Comments Submitted by S. Dinges, Trane-Ingersoll Rand (Terms): http://www.naesb.org/pdf4/req_weq_111510_trane_ingersollrand_terms.xls • REQ Comments Submitted by L. Tillman on behalf of Southern Companies (Phase 2 - PAP03): http://www.naesb.org/pdf4/req_111510_southernco_9a.doc • Comments Submitted by W. Cox, Cox Software Architects LLC (REQ and WEQ Phase 2 - PAP03, PAP04, PAP09 and Data Requirements): http://www.naesb.org/pdf4/req_weq_111510_cox.xls • Late Comments on (REQ) PAP 03 Submitted by D. Pratt, J. Phillips and B. Bartell: http://www.naesb.org/pdf4/req_111510_pratt_phillips_bartell_3_late.doc • Late Comments on (REQ) PAP 03 Submitted by L. Tillman on behalf of Southern Companies: http://www.naesb.org/pdf4/req_111510_southern_3_late.doc



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NORTH AMERICAN ENERGY STANDARDS BOARD EXECUTIVE COMMITTEE MEETING RETAIL QUADRANTS DRAFT AGENDA

Wednesday, February 2, 2011 – 10:00 am to 4:00 pm M

Web Cast and Conference Call, for in person attendance – PERA Club, Tempe, AZ

#	Agenda Item
4.	Review and consider for vote on Retail 2010 Annual Plan Item 9b – Requirements Specifications for Common Scheduling Mechanism for Energy Transactions – for NIST PAP04 – (super-majority vote) • Recommendation: http://www.naesb.org/pdf4/retail_2010_ap9b_rec_101510.doc • Comments November 15, 2010: • Comments Submitted by the B. Bartell, Xtensible Solutions – see above agenda item 3 • Comments Submitted by P. Precht, BGE(Phase 2 - PAP04): http://www.naesb.org/pdf4/req_111510_bge_9b.doc • REQ Comments Submitted by S. Dinges, Trane-Ingersoll Rand (Phase 2 - PAP04): http://www.naesb.org/pdf4/req_111510_trane_ingersollrand_9b.xls • REQ and WEQ Comments Submitted by S. Dinges, Trane-Ingersoll Rand (Terms): see above agenda item 3 • REQ Comments Submitted by L. Tillman on behalf of Southern Companies (Phase 2 – PAP04): http://www.naesb.org/pdf4/req_111510_southernco_9b.doc • Comments Submitted by W. Cox, Cox Software Architects LLC (REQ and WEQ Phase 2 - PAP03, PAP04, PAP09 and Data Requirements): see agenda item 3 • Late Comments on (REQ) PAP 04 Submitted by D. Pratt, J. Phillips and B. Bartell: http://www.naesb.org/pdf4/req_111510_pratt_phillips_bartell_4_late.doc • Late Comments on (REQ) PAP 04 Submitted by L. Tillman on behalf of Southern Companies: http://www.naesb.org/pdf4/req_111510_southern_4_late.doc
5.	Review and consider for vote on Retail 2010 Annual Plan Item 9 - Master Data Requirements List for Standards associated with NIST PAP 03 and PAP09 - (super-majority vote) • Recommendation: http://www.naesb.org/pdf4/req_2010_ap9_rec_101510.doc • Comments November 15, 2010 • REQ and WEQ Comments Submitted by S. Dinges, Trane-IngersollRand (Terms): see agenda item 3 • REQ Comments Submitted by L. Tillman on behalf of Southern Companies (Phase 2 - Data Requirements): http://www.naesb.org/pdf4/req_111510_southernco_9.doc • Comments Submitted by W. Cox, Cox Software Architects LLC (REQ and WEQ Phase 2 - PAP03, PAP04, PAP 09 and Data Requirements): see agenda item 3 • Late Comments on Data Requirements Submitted by D. Pratt, J. Phillips and B. Bartell: http://www.naesb.org/pdf4/req_111510_pratt_phillips_bartell_data_requirements_late.doc • Late Comments on Data Requirements Submitted by L. Tillman on behalf of Southern Companies: http://www.naesb.org/pdf4/req_111510_southern_data_requirements_late.doc



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NORTH AMERICAN ENERGY STANDARDS BOARD EXECUTIVE COMMITTEE MEETING RETAIL QUADRANTS DRAFT AGENDA

Wednesday, February 2, 2011 – 10:00 am to 4:00 pm M

Web Cast and Conference Call, for in person attendance – PERA Club, Tempe, AZ

#	Agenda Item
6.	Review and consider for vote on Retail 2010 Annual Plan Item 9c – Requirements Specifications for Retail Standard DR Signals – for NIST PAP09 - (super-majority vote) • Recommendation: http://www.naesb.org/pdf4/retail_2010_ap_9c_rec_101510.doc • Comments November 15, 2010 • Comments Submitted by B. Bartell, Xtensible Solutions (Phase 2 - PAP03, PAP04, PAP09): see agenda item 3 • Comments Submitted by G. Ghatikar, DRRC - Lawrence Berkely National Laboratory(Phase 2 - PAP09): http://www.naesb.org/pdf4/req_111510_drcc_lbnl.pdf • Comments Submitted by P. Precht, BGE(Phase 2 - PAP09): http://www.naesb.org/pdf4/req_111510_bge_9c.doc • REQ Comments Submitted by S. Dinges, Trane-Ingersoll Rand (Phase 2 - PAP09): http://www.naesb.org/pdf4/req_111510_trane_ingersollrand_9c.xls • REQ and WEQ Comments Submitted by S. Dinges, Trane-Ingersoll Rand (Terms): see agenda item 3 • REQ Comments Submitted by L. Tillman on behalf of Southern Companies (Phase 2 - PAP09): http://www.naesb.org/pdf4/req_111510_southernco_9c.doc • Comments Submitted by W. Cox, Cox Software Architects LLC (REQ and WEQ Phase 2 - PAP03, PAP04, PAP09 and Data Requirements): see agenda item 3 • Late Comments on (REQ) PAP 09 Submitted by D. Pratt, J. Phillips and B. Bartell: http://www.naesb.org/pdf4/req_111510_pratt_phillips_bartell_9_late.doc • Late Comments on (REQ) PAP 09 Submitted by L. Tillman on behalf of Southern Companies: http://www.naesb.org/pdf4/req_111510_southern_9_late.doc
7.	Review and consider for vote on Retail 2010 Annual Plan Item 3c – Phase 2: M&V for Demand Response Programs - (super-majority vote) • Recommendation Redlined: http://www.naesb.org/pdf4/retail_2010_api_3c_rec_redline.doc • Recommendation Clean: http://www.naesb.org/pdf4/retail_2010_api_3c_rec_clean.doc • Comments January 14, 2011 • Comments Submitted by B. Sailors, Duke Energy: http://www.naesb.org/pdf4/req_120810_duke_energy.doc • Late Comments Submitted by Hamilton Consulting on behalf of Southern California Edison: http://www.naesb.org/pdf4/req_120810_sce.doc
8.	Subcommittee Updates (meeting materials for updates will be provided by leadership as they are available): • Triage Subcommittee: http://www.naesb.org/pdf4/tr110910disposition.doc (report), http://www.naesb.org/pdf4/tr011911agenda.doc (new requests), http://www.naesb.org/pdf4/tr011911agenda_revised.doc (revised - new requests) • Business Practices Subcommittee (BPS) and Texas Task Force • DSM-EE Subcommittee • Information Requirements Subcommittee (IR – Not Active) • Technical Electronic Implementation Subcommittee (TEIS)



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NORTH AMERICAN ENERGY STANDARDS BOARD EXECUTIVE COMMITTEE MEETING RETAIL QUADRANTS DRAFT AGENDA

Wednesday, February 2, 2011 – 10:00 am to 4:00 pm M

Web Cast and Conference Call, for in person attendance – PERA Club, Tempe, AZ

#	Agenda Item
	• Glossary Efforts • Smart Grid Standards Development Subcommittee, Smart Grid PAP 10 Subcommittee, Smart Grid Energy Services Provider Interface Task Force
9.	Publication Schedule Review: • WGQ Publication Schedule (Version 2.0): http://www.naesb.org/misc/wgq_publication_schedule_ver2_0.doc, • WGQ Publication Schedule (Version 2.1): http://www.naesb.org/misc/wgq_publication_schedule_ver2_1.doc, • WEQ Publication Schedule (Version 2.2): http://www.naesb.org/misc/weq_publication_schedule_ver2_2.doc, • Retail Publication Schedule (Version 1.3): http://www.naesb.org/misc/retail_publication_schedule_ver1_3.doc, • Retail Publication Schedule (Version 1.4): http://www.naesb.org/misc/retail_publication_schedule_ver1_4.doc (WGQ and WEQ provided for context)
10.	Board of Directors, Board Committee and Regulatory Updates (no votes or action to be taken): • Board and Board Committee Updates – Board Meeting December 9, 2010: http://www.naesb.org/pdf4/bd120910dm.doc • Wholesale Gas and Electric key activities – WGQ Annual Plan, WEQ Annual Plan http://www.naesb.org/pdf4/wgq_2011_annual_plan.doc (WGQ), http://www.naesb.org/pdf4/weq_ec020111w7.doc (WEQ with redlined changes submitted by WEQ Leadership) • Regulatory Updates
11.	Other Business • 2011 Schedule: http://www.naesb.org/misc/2011_schedule.pdf
12.	Adjourn

Attire – Business Casual



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NORTH AMERICAN ENERGY STANDARDS BOARD EXECUTIVE COMMITTEE MEETING WHOLESALE GAS QUADRANT DRAFT AGENDA

Thursday, February 3, 2011 – 9:00 am to 3:00 pm M

PERA Club/Mesquite Hall (first floor of Clubhouse), Phoenix, AZ

#	Agenda Item
1.	Welcome • Antitrust Guidelines http://www.naesb.org/misc/antitrust_guidance.doc (Guidance) • Welcome to members and attendees • Quorum Establishment: Roll Call of WGQ EC Members and Alternates: http://www.naesb.org/pdf4/ec_terms.pdf (EC) and http://www.naesb.org/pdf4/alt_ec_members.pdf (EC Alt)
2.	Consent Agenda (simple majority to approve) • Adoption of WGQ Agenda (simple majority) http://www.naesb.org/pdf4/ec020111a.doc • Adoption of the WGQ EC Meeting Minutes: • October 28, 2010: http://www.naesb.org/pdf4/wgq_ec102810dm.doc , proposed redlines submitted by D. Davis, Williams Gas Pipeline: http://www.naesb.org/pdf4/wgq_ec020311w1.doc • Adoption of changes to the 2011 Annual Plan to be proposed to the Board of Directors: http://www.naesb.org/pdf4/wgq_2011_annual_plan.doc
3.	Review and consider for vote on R10007 - Change the Offer, Bid and Award downloads to have the ability to communicate multiple indexed rates for a given offer (simple majority vote) • Recommendation: http://www.naesb.org/pdf4/wgq_r10007_rec_123010.doc • Comments due February 2, 2011 – none received
4.	Review and consider for vote on R09018 - Add MA data element Path Rank in the Nominations data set and corresponding error message in the Nom QR (super majority vote) • Recommendation: http://www.naesb.org/pdf4/wgq_r09018_rec_123010.doc • Comments due February 2, 2011 – none received
5.	Subcommittee Updates (meeting materials for updates will be provided by leadership as they are available): • Triage Subcommittee: http://www.naesb.org/pdf4/tr110910disposition.doc (report), http://www.naesb.org/pdf4/tr011911agenda.doc (new requests), http://www.naesb.org/pdf4/tr011911agenda_revised.doc (revised - new requests) • Business Practices Subcommittee (BPS) • Electronic Delivery Mechanisms Subcommittee (EDM) • Information Requirements Subcommittee (IR)/Technical Subcommittee • Interpretations Subcommittee • Contracts Subcommittee
6.	Publication Schedule Review: • WGQ Publication Schedule (Version 2.0): http://www.naesb.org/misc/wgq_publication_schedule_ver2_0.doc, • WGQ Publication Schedule (Version 2.1): http://www.naesb.org/misc/wgq_publication_schedule_ver2_1.doc, • WEQ Publication Schedule (Version 2.2): http://www.naesb.org/misc/weq_publication_schedule_ver2_2.doc, • Retail Publication Schedule (Version 1.3): http://www.naesb.org/misc/retail_publication_schedule_ver1_3.doc, • Retail Publication Schedule (Version 1.4): http://www.naesb.org/misc/retail_publication_schedule_ver1_4.doc (Retail and WEQ provided for context)



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NORTH AMERICAN ENERGY STANDARDS BOARD EXECUTIVE COMMITTEE MEETING WHOLESALE GAS QUADRANT DRAFT AGENDA

Thursday, February 3, 2011 – 9:00 am to 3:00 pm M

PERA Club/Mesquite Hall (first floor of Clubhouse), Phoenix, AZ

-
#	Agenda Item
7.	Board of Directors, Board Committee and Regulatory Updates (no votes or action to be taken): • Board and Board Committee Updates – Board Meeting December 9, 2010: http://www.naesb.org/pdf4/bd120910dm.doc • Wholesale Gas and Electric key activities – Retail Annual Plan, WEQ Annual Plan http://www.naesb.org/pdf4/retail_ec020211w2.doc (Retail with redlined changes submitted by Retail Leadership), http://www.naesb.org/pdf4/weq_ec020111w7.doc (WEQ with redlined changes submitted by WEQ Leadership) • Regulatory Updates
8.	Other Business • 2011 Schedule: http://www.naesb.org/misc/2011_schedule.pdf
9.	Adjourn
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December 8, 2010

TO: NAESB Quadrant Executive Committee Members, Alternates and Interested Industry Participants
FROM: Cory Galik Cummings, Staff Attorney
RE: Retail Executive Committee Meeting Draft Minutes

**NORTH AMERICAN ENERGY STANDARDS BOARD
RETAIL EXECUTIVE COMMITTEE MEETING
October 27, 2010
DRAFT MINUTES**

1. Welcome

Mr. Precht called the meeting to order and welcomed the Retail Electric Quadrant (REQ) and Retail Gas Quadrant (RGQ) Executive Committee (EC) members and other participants. Ms. Cummings gave the antitrust guidance and REQ and RGQ members and other participants introduced themselves. Quorum was established. Mr. Jesensky moved to adopt the agenda and Mr. Jones seconded the motion. The motion passed without opposition.

2. Retail Quadrant Draft Minutes

The August 18, 2010 Retail EC meeting minutes were reviewed. Mr. Novak moved, seconded by Mr. Jones, to adopt the minutes as revised. The motion passed unanimously.

3. Consideration and Vote on Minor Corrections

Minor Correction [MC10034](#) was withdrawn by the submitter as duplicative of MC10035.

Ms. Compton Pellizzi provided a review of [MC10035](#). Ms. McKeever moved, seconded by Ms. Compton Pellizzi, to approve MC10035. The motion passed unanimously.

4. Review and Consider for Approval 2010 Retail Annual Plan Item 5(a): Model Business Practices Users Guide - Add a new section to Book 0 to describe what Books have been developed, how the Books are laid out, and revised the title of the Book to reflect the additions

Mr. Precht provided a review of the [recommendation](#). This item was briefly discussed at the last EC meeting. At that time, the EC suggested that the document would be more appropriate split into two documents: 1) Revisions to Book 0 with additional explanations and more model business practices details; 2) Reference document which contains the procedures for retail operations for reference purposes. The two documents are included in the recommendation. It was suggested that the reference document be placed, without password protection, on the retail gas and retail electric web pages so that any interested parties could have access to the procedures. Ms. McQuade stated that any document approved by the EC that would not be password protected would need board approval. She would discuss this with the Managing Committee.

Mr. Jesensky moved, seconded by Ms. McKeever, to approve the recommendation. The motion unanimously passed a super majority vote.



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5. **Review and Consider for Approval 2010 Retail Annual Plan Item 11: Master List of Defined Terms - Review the definitions of all Defined Terms in Book 0 – Master List of Defined Terms, including other Ratified Terms not yet published, and revise the definitions of all Defined Terms not specifically related solely to the competitive marketplace to broaden their applicability to conform to NAESB's expanded scope**

Mr. Precht provided a review of the [recommendation](#). Mr. Jones moved, seconded by Ms. McKeever, to approve the recommendation. The motion unanimously passed a super majority vote.

6. **Review, discuss, identify changes and vote to approve changes to the 2010 Annual Plan to be proposed to the Board of Directors**

The 2010 Retail Annual Plan was reviewed and modified by participants. A motion to approve [the annual plan as modified](#) was made by Ms. Munson and seconded by Mr. Barkas. The motion passed unanimously.

7. **Review, discuss, identify changes and vote to approve the 2011 Annual Plan to be proposed to the Board of Directors**

The 2011 Retail Annual Plan was reviewed and modified by participants. A motion to approve the [annual plan as modified](#) was made by Mr. Jones and seconded by Mr. Jesensky. The motion passed unanimously.

8. **Update on Subcommittee Activities**

Triage Subcommittee: Ms. McQuade provided the review of triaged items. R10009 was assigned to WGQ.

Smart Grid Standards Development Subcommittee: The Smart Grid Standards Development Subcommittee addressing the requests from NIST related to Priority Action Plans 3, 4 and 9 completed their phase two effort on October 14, 2010 and voted out four wholesale recommendations and four retail recommendations. The recommendations include updates to the phase one standards and expand on the data requirements related to the phase one use cases. The subcommittee also responded the ECs request to review the Executive Summary and Introduction of the phase one standards and to reconsider language that may not be appropriate for long-term business practices. The recommendations for Priority Action Plans 3 and 4 are nearly identical for wholesale and retail. The most extensive changes were made to the priority action plan 9 recommendations with the inclusion of the data requirements related to the transactions described in the use cases.

The fourth wholesale recommendation is a Master Data Element Table providing all of the data elements included in the phase one recommendation. All of these recommendations were posted for a 30 day formal comment period ending on November 15, 2010. At the completion of the formal comment period, the subcommittee will meet to review the comments and provide a set of late comments for the ECs review. A single topic review session and meeting to vote on these recommendations will be scheduled in late November or early December.

In the mean time the subcommittee is scheduling meetings with the SGIP and other external groups to ensure that these standards have met the requirements of the SGIP PAP teams and have been incorporated into the standards that are being developed by other groups such as OASIS and ZigBee.

Since the last EC meeting in August, the PAP 10 Subcommittee voted to post both the wholesale and retail recommendations for the 30 day formal comment period on August 31 – comments were due on September 30. Almost 20 sets of comments were received, which the subcommittee reviewed and in response developed a set of late comments that were reviewed at the October 15 single topic EC review session. After the review session three additional sets of late comments were received, reviewed and incorporated during the October 22 EC meeting. The retail recommendation passed a super majority vote and the wholesale recommendation is currently out for notational ballot. If the recommendation passes the WEQ both the WEQ and REQ recommendation will go out for ratification on October 29 and will become a final action on December 1.



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Mr. Booe attended Grid Week in DC last week and the NAESB PAP 10 standard was referenced in multiple remarks from George Arnold at NIST and Aneesh Chopra, the Federal Chief Technology Officer of the United States.

A phase two item on the 2011 annual plan for PAP 10 was added in case it is necessary to clean up the standards or more closely align it with the CIM or other standards. After the December 3 SGIP meeting the subcommittee will know what, if anything, should be done as part of a phase two effort.

The Energy Services Provider Interface Task Force held a face to face meeting on October 6 and 7 and good discussion was had on where the Task Force intends to go and began creating a draft recommendation outline from which to build. Several participants took assignments to incorporate the Open ADE business requirements and system requirements document into a typical NAESB standards format. The Task Force has scheduled a conference call this afternoon to continue the work as well as four additional meetings before the end of the year.

Business Practice Subcommittee: Mr. Jones provided the update. The recent focus has been on the two recommendations that were voted out earlier in the meeting. The BPS has turned its attention to items to be completed in 2011, including supplier/marketing practices, supplier certification and additional model business practices for the registration agent marketplace.

DSM-EE Subcommittee: Mr. Precht provided the update. The retail demand response work group is working on completing its phase 2 efforts. The phase 2 recommendation went out for an informal comment period in July and the work group is waiting for the wholesale and retail demand response work groups to finish their review of the glossaries before sending it out for another informal comment period. The retail phase 2 recommendation is expected to be voted upon by the DSM-EE subcommittee at the December 1 DSM-EE meeting in Richmond, VA. The glossary work is underway to compare the wholesale and retail DR terms, as well as the smart grid glossary, to ensure consistency among the various work groups.

The retail demand response work group has also worked on developing a recommendation for R10002, develop new standards to create common interfaces and data structures necessary for enrolling demand response sites into a demand response program. At the October 12 retail demand response work group meeting, the work group reviewed the wholesale PAP09 phase 2 recommendation, the retail PAP09 phase 2 recommendation and the master data elements list and determined that those documents satisfied the original request. Mr. Precht will be contacting James Tillett, the original requestor, to determine if those documents satisfy him. If James Tillett is satisfied with the phase 2 documents, Mr. Precht will draft a recommendation stating that the three PAP 09 documents satisfy the request. The work group will wait until the PAP 09 documents have been adopted by the Executive Committees before it is voted out by the DSM-EE subcommittee.

The retail energy efficiency group has completed the scoping of their work product and has begun drafting its recommendation. It currently has a draft glossary and several participants have begun to draft language for the model business practices. This language will be discussed at the November 5 retail energy efficiency work group meeting.

The wholesale energy efficiency group presented its draft recommendation at the September 29 DSM-EE subcommittee meeting. After completing a review of the recommendation on October 8, the wholesale energy efficiency recommendation was submitted for an informal comment period, with comments due November 8. Any interested participant is encouraged to review the recommendation and supply comments. The recommendation and comments will be reviewed by the wholesale energy efficiency work group prior to a vote by the DSM-EE subcommittee on December 1.

The wholesale demand response work group completed its phase 2 recommendation, which is also out for an informal comment period, with comments due October 29. Again, any interested participants are encouraged to submit comments. The comments will be reviewed by the wholesale demand response work group on November 5th and 12th. This recommendation will also be voted on by the DSM-EE subcommittee on December 1.



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The next full DSM-EE subcommittee meeting is scheduled for December 1, 2010 in Richmond, Virginia, hosted by Dominion Virginia Power.

Glossary Efforts: Mr. Jones provided the update. The Glossary Subcommittee has been working with the wholesale and retail demand response work groups to review their glossary terms in an effort to maintain consistency. Mr. Precht noted that has become more difficult to manage definitions and coordination of definitions among the different subcommittees and quadrants. He moved to adopt the harmonization of defined terms procedures:

The Executive Committees of the WEQ, REQ and RGQ direct the Chairs of all WEQ, REQ and RGQ Subcommittees and Task Forces that, when developing definitions of terms, they should forward all terms and proposed definitions to either the Retail Glossary Subcommittee or the WEQ SRS, as appropriate, for review and approval to ensure consistency and to eliminate any conflicts with other definitions. Should the definitions be different across quadrants or within quadrants, the contextual reasons should be identified. Further, the Chairs of the Retail Glossary Subcommittee and the WEQ SRS, upon receiving a request for defining a term, should contact the Chair of the other Subcommittee informing them of the terms and definitions. In the event of a conflict between Retail and WEQ, the Chairs should schedule a joint meeting/conference call to resolve the conflict.

Ms. Marino seconded the motion. The motion passed without opposition.

Publication Schedule: Ms. McQuade reviewed the publication schedule of the Wholesale Electric, Wholesale Gas and Retail Quadrants.

9. Board of Directors, Board Committee and Regulatory Updates

Board Updates: Ms. McQuade encouraged participants to review the minutes from the September 23, 2010 Board of Directors meeting. The September meeting was the meeting of the members and the strategic session. In addition there was significant discussion on Smart Grid and the need for some level of integration of renewables and the natural gas resources to support renewables.

Board Critical Infrastructure Committee: Ms. McQuade provided the update. The Board CIC is chaired by Cade Burkes and Jesse Hurley. The purpose of the committee is not to recommend standards, but rather to advise the board on critical infrastructure topics that may impact NAESB. Mr. Hurley works closely with Congressional staff on a number of pending legislative acts, in particular the Lieberman Senate Bill. She encouraged participants to review the September 30 meeting notes for more information.

Regulatory Efforts: Mr. Novak has been working with various state commissions to increase their awareness of NAESB's work products.

Wholesale Gas and Wholesale Electric Activities: The WGQ 2010 Annual Plan and the WEQ 2010 Annual Plan were briefly reviewed.

10. Other Business

Ms. McQuade noted that those EC members with terms ending at the end of 2010 have been contacted to see if they would run again for their seat. If there are any contested races the NAESB office will run elections.

11. Adjourn

Mr. Jones moved, seconded by Mr. Jesensky, to adjourn the meeting. The meeting adjourned at 1:32 PM Eastern.



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12. Attendance and Vote Record

RETAIL GAS QUADRANT EXECUTIVE COMMITTEE		ATTENDANCE	2010 RETAIL ANNUAL PLAN ITEM 5(A)	2010 RETAIL ANNUAL PLAN ITEM 11
SERVICE PROVIDERS/SUPPLIERS SEGMENT				
Dwight M. Whitley, Jr.	Sierra Southwest Cooperative Services, Inc.			
Richard Zollars	Dominion Retail, Inc.	Phone	Support	Support
DISTRIBUTION SEGMENT				
Dan Jones	Duke Energy	In Person	Support	Support
Michael Novak	National Fuel Gas Distribution Corporation	Phone	Support	Support
Julie Compton Pellizzi	AGL Resources, Inc.	Phone		
END USER SEGMENT/PUBLIC AGENCIES SEGMENT				
RETAIL ELECTRIC QUADRANT EXECUTIVE COMMITTEE		ATTENDANCE		
SERVICE PROVIDERS/SUPPLIERS SEGMENT				
Bill Barkas	Dominion Retail, Inc.	In Person	Support	Support
Jim Minneman	PPL Solutions, LLC			
Jennifer Teel	EC Power			
Susan Munson	Electric Reliability Council of Texas	Phone	Support	Support
UTILITIES SEGMENT				
Phil Precht	Baltimore Gas and Electric Company	In Person	Support	Support
Debbie McKeever for Patrick Eynon	Ameren Services	Phone	Support	Support
Judy Ray	Alabama Power Company	Phone	Support	Support
Michael Jesensky	Dominion Virginia Power	In Person	Support	Support
END USER/PUBLIC AGENCIES SEGMENT				
Annunciata Marino	Pennsylvania Public Utility Commission	In Person	Support	Support
Christopher Kotting	Public Utility Commission of Ohio			



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VOTE	VOTES POSSIBLE	VOTES CAST SUPER MAJORITY	MOTION PASSING
2010 RETAIL ANNUAL PLAN ITEM 5(A)	RGQ: 5 REQ: 10	RGQ: support: 3 abstention: 0 opposed: 0 REQ: support: 7 abstention: 0 opposed: 0	RGQ: Yes REQ: Yes
2010 RETAIL ANNUAL PLAN ITEM 11	RGQ: 5 REQ: 10	RGQ: support: 3 abstention: 0 opposed: 0 REQ: support: 7 abstention: 0 opposed: 0	RGQ: Yes REQ: Yes

13. Other Participants

Other Participant Attendance		
Participant	Organization	Attendance
Jonathan Booe	NAESB	In Person
Cory Cummings	NAESB	In Person
Rae McQuade	NAESB	In Person
Wendell Miyaji	Comverge	Phone
Veronica Thomason	NAESB	In Person
Jill Vaughn	Court Reporter	In Person



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January 18, 2011

TO: NAESB Wholesale Electric Quadrant (WEQ) & Retail Electric Quadrant (REQ) Executive Committees and Interested Industry Participants

FROM: Jonathan Booe, NAESB Staff Attorney

RE: WEQ & REQ Executive Committees Single Topic Conference Call – Draft Minutes

**NORTH AMERICAN ENERGY STANDARDS BOARD
WHOLESALE & RETAILELECTRIC QUADRANTS
EXECUTIVE COMMITTEES
SINGLE TOPIC CONFERENCE CALL
Friday, October 22, 2010 – 1:00 pm to 4:00 pm Central
FINAL MINUTES**

1. Welcome

Ms. York called the meeting to order and welcomed the Retail Electric Quadrant (“REQ”) and Wholesale Electric Quadrant (“WEQ”) Executive Committee (“EC”) members, alternates and other participants. Mr. Booe provided the anti-trust guidance and called the roll of the REQ and WEQ EC members and alternates. A quorum was established for both Executive Committees. Ms. York reviewed the agenda and noted that the WEQ EC would address the comments and vote on the recommendation prior to the REQ EC action. Mr. Dison noted that the agenda did not include the late comments submitted by Mr. Tillman and asked if the agenda should be modified to include the comments. Ms. York and Ms. McQuade explained that agenda item 2 is broad enough to encompass the review of any comments submitted to either EC. Ms. Ray suggested that the WEQ EC review the comments submitted by Mr. Tillman rather than the late comments submitted by the Smart Grid Standards Subcommittee on Priority Action Plan 10 (PAP 10 subcommittee) as they modify the subcommittee draft. The participants agreed to review Mr. Tillman’s comments first. Ms. Wesley moved to adopt the agenda as discussed and Mr. Gladney seconded the motion. The motion passed without opposition.

2. Wholesale Electric Quadrant Review and Vote

Ms. Crockett moved to adopt the recommendation for WEQ 2010 Annual Plan Item 6(d) as submitted by the PAP 10 subcommittee. Mr. Winkler seconded the motion. Mr. Tillman reviewed the late comments submitted by [Southern Company](#). He stated that the purpose of his comments are to make clear the origin of the requirements included in Appendix A of the draft recommendation and to recommend that Appendix A be removed from the proposed standard. He stated that the requirements included in Appendix A were taken directly and unmodified from the SGIP and therefore were not properly vetted through the NAESB process. Mr. Pritchard made a motion to amend the motion on the table and adopt the redline language contained in the comments submitted by Southern Company. Mr. Ciza seconded the motion. Mr. Winkler stated that he does not support deleting Appendix A from of the recommendation. Mr. Johnson stated that he does support removing the Appendix and including the proposed language from Southern Company with the exception of the fourth paragraph. Mr. Ciza stated that he would like to adopt the proposed language prior to deleting the Appendix so that it is included in the artifact document. Mr. Tillman stated that taking the action proposed in the comments by Southern Company would bolster the credibility of NAESB and make the standard stronger. Mr. Ulch supported Mr. Tillman’s comments. Mr. Burns stated his support of including the Appendix in the recommendation. After further discussion, the participants took a simple majority vote on the amendment. The amendment passed a simple majority vote.

Mr. Winkler stated that the language added to the Executive Summary of the document by the previous amendment is inappropriate given the deletion of Appendix A. Ms. Ray stated that Southern Company supports including the language in the Executive Summary even with the deletion of Appendix A as it provides clarity. Mr. Ciza supported Ms. Ray’s statement. Mr. Gallagher made a motion to amend the motion on the table to delete the four paragraphs proposed by Southern Company in the Executive Summary of the recommendation. Mr. Johnson seconded the



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motion. Ms. York recommended that the EC take a roll call vote on the motion. The motion passed a simple majority roll call vote. [Vote 1].

Next, the participants reviewed the [Late Comments of the Smart Grid Standards Development Subcommittee submitted on October 18, 2010](#). Ms. York noted that the set of late comments incorporates the determinations of the subcommittee in response to all comments submitted and was reviewed by the subcommittee on October 4-5, 2010. She also noted that the late comments incorporate the first set of late comments submitted by Mr. Skiba. Mr. Skiba confirmed. Mr. Gallagher made a motion to amend the motion on the table and adopt the redline modifications included in the October 18, 2010 late comments. Mr. Gladney seconded the motion. Mr. Tillman offered a few minor corrections to the recommendation he noted during his final review as friendly amendments to Mr. Gallagher's motion. Mr. Gallagher and Mr. Gladney accepted the friendly amendments. Mr. Johnson stated that he too had some suggested modifications that he would like Mr. Gallagher and Mr. Gladney to consider. Mr. Johnson noted that the term Market Participant is included as a definition in the wholesale recommendation but only included in the recommendation in one instance and not capitalized. Mr. Skiba confirmed Mr. Johnson's comment. Mr. Gallagher and Mr. Gladney accepted the deletion of the definition as a friendly amendment. Mr. Johnson also noted that the term System Operator is included in the recommendation but not defined. Mr. Winkler and Mr. Booe explained that the term System Operator is defined in the Demand Response standards and included in WEQ-000. Mr. Winkler read the definition as adopted in the Demand Response recommendation. Mr. Johnson stated that he is comfortable with the definition. Mr. Winkler noted that the WEQ and REQ working group addressing the Demand Response terms and definitions made a modification to the term Governing Documents during a previous meeting and that the modification should be reflected in the recommendation for consistency. Mr. Precht reviewed the modification and Mr. Gallagher and Mr. Gladney accepted it as a friendly amendment. Mr. Dison clarified that the preamble adopted as part of Appendix A and then subsequently removed will remain in the draft recommendation as a redline strikethrough. Mr. Booe confirmed. The participants took a simple majority vote on Mr. Gallagher's motion and the motion passed without opposition.

The participants reviewed the [Additional Late Comments Submitted by E. Skiba, Midwest ISO](#). Mr. Skiba presented the comments and noted that his original comments were incorporated into the October 18, 2010 draft and his additional comments are intended to supplement that draft. Mr. Skiba noted that several of his comments are no longer applicable given the action of the EC in addressing previous comments. Specifically, bullet number one of comment four, comment seventeen, bullet number three of comment eighteen, comment twenty-three and comment twenty-five were disregarded. All other comments were addressed and modifications to the recommendation were made through discussion. Mr. Skiba made a motion to amend the motion on the table to incorporate the additional late comments submitted by Mr. Skiba and as discussed by the EC. Ms. Wesley seconded the motion. The motion passed a simple majority vote without opposition.

Ms. York asked if there were any other comments on the motion on the table to adopt the recommendation as amended. No comments were offered. Mr. Dison asked if a notational ballot would be distributed if the required super-majority support were not met. Mr. Booe stated that if a determination on the motion cannot be made due to a lack of votes, the motion would be distributed for notational ballot to the EC members not in attendance. Ms. McQuade stated that alternates vote in lieu of the absent EC member and that the absent EC member represented by an alternate would not receive a notational ballot. The participants took a roll call super majority vote. [Vote 2]. A determination on the motion could not be made due to a lack of votes. The motion will be distributed for a notational ballot period. The recommendation as modified by the WEQ EC can be found in redline format through the following hyperlink: http://www.naesb.org/pdf4/weq_ec102210ballot_a1.doc.

3. Retail Electric Quadrant Review and Vote

Mr. Precht stated that he would like to expedite the meeting by asking someone to make a motion to adopt the recommendation of the subcommittee with the addition of:

- the language offered by Mr. Tillman to Appendix A;
- the late comments of the subcommittee offered in the October 18, 2010 draft recommendation;
- the deletion of Appendix A and related modifications to the recommendation;



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- the editorial comments offered to REQ.18.4.1, REQ.18.4.1.3, REQ.18.4.1.4 and REQ.18.4.1.8 and
- the late comments submitted by Mr. Skiba incorporating the modifications made to the WEQ recommendation with the exception of comments 1, 2, 3, the first bullet of 4, 7, 8, 9 and 11.

Ms. Marino made the motion as reviewed by Mr. Precht and Mr. Kotting seconded the motion. Ms. Ray made a motion to amend to the motion on the table to incorporate the language included in the Executive Summary of the comments submitted by Mr. Tillman. Mr. Allen seconded the motion. Mr. Jesensky clarified that Ms. Ray's motion would create a significant deviation between the wholesale and retail standard. Ms. Ray confirmed. Mr. Precht noted that the Board of Directors requested that the Executive Committees provide an explanation for substantive differences between wholesale and retail standards developed jointly. Ms. Ray asked to move to the vote. The amendment failed a simple majority roll call vote. [Vote 3].

Mr. Precht asked if anyone would like to offer any additional comments or discussion. Ms. Ray stated that she would like to offer the deletion of the reference to Appendix A in REQ.18.1.1.7 as a friendly amendment. Ms. Marino and Mr. Kotting accepted the amendment. The participants took a roll call super majority vote and the motion passed the required super majority threshold. [Vote 4].

4. Other Business

No other business was discussed.

5. Adjourn

Mr. Allen moved to adjourn the meeting at 3:15 PM Central.



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6. Voting Record and Attendance

NORTH AMERICAN ENERGY STANDARDS BOARD

REQ/WEQ EXECUTIVE COMMITTEE

Voting Record from June 16, 2010

VOTES = V		S – indicates an affirmative vote, O – indicates a vote in opposition, A – indicates an abstention, NB – indicates a vote cast through notational ballot and a blank cell indicates that the voter did not vote. The motions from which the voting results are detailed below are noted in the minutes.			
ATTENDANCE	V1 ¹	V2	V3 ²	V4	
				WEQ TRANSMISSION SEGMENT	SUBSEGMENT: WEQ TRANSMISSION SEGMENT
Phone	O			Patrick McGovern	Georgia Transmission Corporation
				Luke O'Dwyer	Salt River Project
Phone	O	S		Dean Ulch alt. for Daryl McGee	Southern Company Services
				Edward Davis	Entergy Services, Inc.
		S(NB)		Marceline Otondo	Arizona Public Service
Phone		S(NB)		Bob Harshbarger	Puget Sound Energy
	A			Hasnah Mat-Amin alt. for Michelle Mizumori	Western Electricity Coordinating Council
				WEQ GENERATION SEGMENT	
Phone	O	S		William J. Gallagher	Vermont Public Power Supply Authority
Phone	S	S		Kathy York	Tennessee Valley Authority
Phone	O	S		John Ciza	Southern Company Services
Phone	S	S		Alan Johnson	NRG Energy, Inc.
		A(NB)		Trent Carlson	RRI Energy Services, Inc.
		S(NB)		Shah Hossain	Westar Energy, Inc.
				WEQ MARKETERS/BROKERS SEGMENT	
Phone	O	S		Chris Norton	American Municipal Power, Inc.

¹ Roll Call Simple Majority Vote

² Roll Call Simple Majority Vote



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NORTH AMERICAN ENERGY STANDARDS BOARD

REQ/WEQ EXECUTIVE COMMITTEE

Voting Record from June 16, 2010

VOTES = V		S – indicates an affirmative vote, O – indicates a vote in opposition, A – indicates an abstention, NB – indicates a vote cast through notational ballot and a blank cell indicates that the voter did not vote. The motions from which the voting results are detailed below are noted in the minutes.			
ATTENDANCE	V1 ¹	V2	V3 ²	V4	
Phone	S	S		Valerie Crockett alt. for B. Thornton	Tennessee Valley Authority
				Richard Lehman	Salt River Project
Phone	O	S		Joel Dison alt. for John Apperson	PacifiCorp Energy
Phone	S	S		Roy True	ACES Power Marketing
				Barry Green	Electric Power Supply Association (EPSA)
WEQ DISTRIBUTION/LOAD SERVING ENTITIES (LSE) SEGMENT					SUBSEGMENT:
				Ray Phillips	Alabama Municipal Electric Authority
Phone	O	S		Alan Pritchard	Duke Energy Corporation
Phone	O	S		Rufus D. Gladney	Consumers Energy Company
Phone	S	S		Robert Martinko	FirstEnergy Service Company
				Syd Berwager	Bonneville Power Administration
		S(NB)		Andy Rodriquez	NERC
WEQ END USERS SEGMENT					
				Aaron Breidenbaugh	EnerNOC, Inc.
		S(NB)		Lou Ann Westerfield	Idaho Public Utilities Commission, rep. National Association of Regulatory Utility Commissioners
Phone	S	S		Christopher Kotting	Public Utility Commission of Ohio
		S(NB)		Paul Sorenson	Open Access Technology International, Inc.
WEQ INDEPENDENT GRID OPERATORS/PLANNERS SEGMENT					
Phone	S	S		Cathy Wesley alt. for Thomas Bowe	PJM Interconnection
		S(NB)		Jim Castle	New York Independent System Operator, Inc.



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NORTH AMERICAN ENERGY STANDARDS BOARD

REQ/WEQ EXECUTIVE COMMITTEE

Voting Record from June 16, 2010

VOTES = V		S – indicates an affirmative vote, O – indicates a vote in opposition, A – indicates an abstention, NB – indicates a vote cast through notational ballot and a blank cell indicates that the voter did not vote. The motions from which the voting results are detailed below are noted in the minutes.			
ATTENDANCE	V1 ¹	V2	V3 ²	V4	
Phone	S	S			Eric Winkler alt. for Matt Goldberg Nancy Traweek Joel Mickey
					ISO New England, Inc. California ISO Electric Reliability Council of Texas
Phone	S	S			Ed Skiba
Phone	S	S			Charles Yeung
					Midwest ISO Southwest Power Pool
WEQ TECHNOLOGY AND SERVICES					
		S(NB)			Jim Buccigross 8760, INC
REQ SERVICE PROVIDERS/SUPPLIERS SEGMENT					
Phone			S	S	Bill Barkas
Phone			S	S	Neal Allen alt. for Jim Minneman Jennifer Teel
					ista
Phone			A	S	Susan Munson
					Electric Reliability Council of texas
REQ UTILITIES SEGMENT					
Phone			O	S	Phil Precht
					Baltimore Gas and Electric Company Ameren Services
Phone			S	S	Judy Ray
Phone			O	S	Michael J. Jesensky
					Alabama Power Company Dominion Resources Services, Inc.
END USER/PUBLIC AGENCIES SEGMENT					
Phone			O	S	Annunciata E. Marino
					Pennsylvania Public Utility Commission Christopher Kotting
					Public Utility Commission of Ohio



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Voting Results for Supermajority Votes

	Votes Possible	Votes Cast	Percentage Affirmative Votes Cast	Reaching the 40% Segment Affirmative Vote Threshold?	Motion Passing
V2 – SUPERMAJORITY	WEQ – 37	25 affirmative 1 abstention 0 opposed	68%	Y	Passes Super Majority Vote
V4 – SUPERMAJORITY	REQ – 10	7 affirmative 0 abstention 0 opposed	70%	Y	Passes Super Majority Vote



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7. Other Participants

Participant	Organization
John Apperson	PacifiCorp
Martin Bartel	Northeast Utilities
Jonathan Booe	NAESB
Martin Burns	Hypertek, Inc.
Ernie Cardone	New York ISO
Brent Hodges	Reliant
Dave Kaufman	Honeywell
Marie Knox	Midwest ISO
Ross Kovacs	Georgia Transmission Corporation
Debbie McKeever	Oncor
Rae McQuade	NAESB
Gregory Obenchain	EEI
Brad Ramsay	NARUC
Jim Reiley	Exelon Corporation
Veronica Thomason	NAESB
Steve Van Ausdall	Xtensible Solutions
Jill Vaughn	Court Reporter
David Wollman	NIST
Jimmy Womack	SPP



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January 18, 2011

TO: NAESB Wholesale Electric Quadrant (WEQ) & Retail Electric Quadrant (REQ) Executive Committees and Interested Industry Participants
FROM: Jonathan Booe, NAESB Staff Attorney
RE: WEQ & REQ Executive Committees Single Topic Conference Call – Draft Minutes

**NORTH AMERICAN ENERGY STANDARDS BOARD
WHOLESALE & RETAILELECTRIC QUADRANTS
EXECUTIVE COMMITTEES
SINGLE TOPIC CONFERENCE CALL
Friday, October 22, 2010 – 1:00 pm to 4:00 pm Central
FINAL-DRAFT MINUTES**

1. Welcome

Ms. York called the meeting to order and welcomed the Retail Electric Quadrant (“REQ”) and Wholesale Electric Quadrant (“WEQ”) Executive Committee (“EC”) members, alternates and other participants. Mr. Booe provided the anti-trust guidance and called the roll of the REQ and WEQ EC members and alternates. A quorum was established for both Executive Committees. Ms. York reviewed the agenda and noted that the WEQ EC would address the comments and vote on the recommendation prior to the REQ EC action. Mr. Dison noted that the agenda did not include the late comments submitted by Mr. Tillman and asked if the agenda should be modified to include the comments. Ms. York and Ms. McQuade explained that agenda item 2 is broad enough to encompass the review of any comments submitted to either EC. Ms. Ray suggested that the WEQ EC review the comments submitted by Mr. Tillman rather than the late comments submitted by the Smart Grid Standards Subcommittee on Priority Action Plan 10 (PAP 10 subcommittee) as they modify the subcommittee draft. The participants agreed to review Mr. Tillman’s comments first. Ms. Wesley moved to adopt the agenda as discussed and Mr. Gladney seconded the motion. The motion passed without opposition.

2. Wholesale Electric Quadrant Review and Vote

Ms. Crockett moved to adopt the recommendation for WEQ 2010 Annual Plan Item 6(d) as submitted by the PAP 10 subcommittee. Mr. Winkler seconded the motion. Mr. Tillman reviewed the late comments submitted by [Southern Company](#). He stated that the purpose of his comments are to make clear the origin of the requirements included in Appendix A of the draft recommendation and to recommend that Appendix A be removed from the proposed standard. He stated that the requirements included in Appendix A were taken directly and unmodified from the SGIP and therefore were not properly vetted through the NAESB process. Mr. Pritchard made a motion to amend the motion on the table and adopt the redline language contained in the comments submitted by Southern Company. Mr. Ciza seconded the motion. Mr. Winkler stated that he does not support deleting Appendix A from the recommendation. Mr. Johnson stated that he does support removing the Appendix and including the proposed language from Southern Company with the exception of the fourth paragraph. Mr. Ciza stated that he would like to adopt the proposed language prior to deleting the Appendix so that it is included in the artifact document. Mr. Tillman stated that taking the action proposed in the comments by Southern Company would bolster the credibility of NAESB and make the standard stronger. Mr. Ulch supported Mr. Tillman’s comments. Mr. Burns stated his support of including the Appendix in the recommendation. After further discussion, the participants took a simple majority vote on the amendment. The amendment passed a simple majority vote.

Mr. Winkler stated that the language added to the Executive Summary of the document by the previous amendment is inappropriate given the deletion of Appendix A. Ms. Ray stated that Southern Company supports including the language in the Executive Summary even with the deletion of Appendix A as it provides clarity. Mr. Ciza supported Ms. Ray’s statement. Mr. Gallagher made a motion to amend the motion on the table to delete the four paragraphs proposed by Southern Company in the Executive Summary of the recommendation. Mr. Johnson seconded the



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motion. Ms. York recommended that the EC take a roll call vote on the motion. The motion passed a simple majority roll call vote. [Vote 1].

Next, the participants reviewed the [Late Comments of the Smart Grid Standards Development Subcommittee submitted on October 18, 2010](#). Ms. York noted that the set of late comments incorporates the determinations of the subcommittee in response to all comments submitted and was reviewed by the subcommittee on October 4-5, 2010. She also noted that the late comments incorporate the first set of late comments submitted by Mr. Skiba. Mr. Skiba confirmed. Mr. Gallagher made a motion to amend the motion on the table and adopt the redline modifications included in the October 18, 2010 late comments. Mr. Gladney seconded the motion. Mr. Tillman offered a few minor corrections to the recommendation he noted during his final review as friendly amendments to Mr. Gallagher's motion. Mr. Gallagher and Mr. Gladney accepted the friendly amendments. Mr. Johnson stated that he too had some suggested modifications that he would like Mr. Gallagher and Mr. Gladney to consider. Mr. Johnson noted that the term Market Participant is included as a definition in the wholesale recommendation but only included in the recommendation in one instance and not capitalized. Mr. Skiba confirmed Mr. Johnson's comment. Mr. Gallagher and Mr. Gladney accepted the deletion of the definition as a friendly amendment. Mr. Johnson also noted that the term System Operator is included in the recommendation but not defined. Mr. Winkler and Mr. Booe explained that the term System Operator is defined in the Demand Response standards and included in WEQ-000. Mr. Winkler read the definition as adopted in the Demand Response recommendation. Mr. Johnson stated that he is comfortable with the definition. Mr. Winkler noted that the WEQ and REQ working group addressing the Demand Response terms and definitions made a modification to the term Governing Documents during a previous meeting and that the modification should be reflected in the recommendation for consistency. Mr. Precht reviewed the modification and Mr. Gallagher and Mr. Gladney accepted it as a friendly amendment. Mr. Dison clarified that the preamble adopted as part of Appendix A and then subsequently removed will remain in the draft recommendation as a redline strikethrough. Mr. Booe confirmed. The participants took a simple majority vote on Mr. Gallagher's motion and the motion passed without opposition.

The participants reviewed the [Additional Late Comments Submitted by E. Skiba, Midwest ISO](#). Mr. Skiba presented the comments and noted that his original comments were incorporated into the October 18, 2010 draft and his additional comments are intended to supplement that draft. Mr. Skiba noted that several of his comments are no longer applicable given the action of the EC in addressing previous comments. Specifically, bullet number one of comment four, comment seventeen, bullet number three of comment eighteen, comment twenty-three and comment twenty-five were disregarded. All other comments were addressed and modifications to the recommendation were made through discussion. Mr. Skiba made a motion to amend the motion on the table to incorporate the additional late comments submitted by Mr. Skiba and as discussed by the EC. Ms. Wesley seconded the motion. The motion passed a simple majority vote without opposition.

Ms. York asked if there were any other comments on the motion on the table to adopt the recommendation as amended. No comments were offered. Mr. Dison asked if a notational ballot would be distributed if the required super-majority support were not met. Mr. Booe stated that if a determination on the motion cannot be made due to a lack of votes, the motion would be distributed for notational ballot to the EC members not in attendance. Ms. McQuade stated that alternates vote in lieu of the absent EC member and that the absent EC member represented by an alternate would not receive a notational ballot. The participants took a roll call super majority vote. [Vote 2]. A determination on the motion could not be made due to a lack of votes. The motion will be distributed for a notational ballot period. The recommendation as modified by the WEQ EC can be found in redline format through the following hyperlink: http://www.naesb.org/pdf4/weq_ec102210ballot_a1.doc.

3. Retail Electric Quadrant Review and Vote

Mr. Precht stated that he would like to expedite the meeting by asking someone to make a motion to adopt the recommendation of the subcommittee with the addition of:

- the language offered by Mr. Tillman to Appendix A;
- the late comments of the subcommittee offered in the October 18, 2010 draft recommendation;
- the deletion of Appendix A and related modifications to the recommendation;



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- the editorial comments offered to REQ.18.4.1, REQ.18.4.1.3, REQ.18.4.1.4 and REQ.18.4.1.8 and
- the late comments submitted by Mr. Skiba incorporating the modifications made to the WEQ recommendation with the exception of comments 1, 2, 3, the first bullet of 4, 7, 8, 9 and 11.

Ms. Marino made the motion as reviewed by Mr. Precht and Mr. Kotting seconded the motion. Ms. Ray made a motion to amend to the motion on the table to incorporate the language included in the Executive Summary of the comments submitted by Mr. Tillman. Mr. Allen seconded the motion. Mr. Jesensky clarified that Ms. Ray's motion would create a significant deviation between the wholesale and retail standard. Ms. Ray confirmed. Mr. Precht noted that the Board of Directors requested that the Executive Committees provide an explanation for substantive differences between wholesale and retail standards developed jointly. Ms. Ray asked to move to the vote. The amendment failed a simple majority roll call vote. [Vote 3].

Mr. Precht asked if anyone would like to offer any additional comments or discussion. Ms. Ray stated that she would like to offer the deletion of the reference to Appendix A in REQ.18.1.1.7 as a friendly amendment. Ms. Marino and Mr. Kotting accepted the amendment. The participants took a roll call super majority vote and the motion passed the required super majority threshold. [Vote 4].

4. Other Business

No other business was discussed.

5. Adjourn

Mr. Allen moved to adjourn the meeting at 3:15 PM Central.



North American Energy Standards Board

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6. Voting Record and Attendance

NORTH AMERICAN ENERGY STANDARDS BOARD REQ/WEQ EXECUTIVE COMMITTEE

Voting Record from June 16, 2010

VOTES = V		S – indicates an affirmative vote, O – indicates a vote in opposition, A – indicates an abstention, NB – indicates a vote cast through notational ballot and a blank cell indicates that the voter did not vote. The motions from which the voting results are detailed below are noted in the minutes.			
ATTENDANCE	V1 ¹	V2	V3 ²	V4	
WEQ TRANSMISSION SEGMENT					
Phone	O			Patrick McGovern	Georgia Transmission Corporation
				Luke O'Dwyer	Salt River Project
Phone	O	S		Dean Ulch alt. for Daryl McGee	Southern Company Services
				Edward Davis	Entergy Services, Inc.
		S(NB)		Marceline Otondo	Arizona Public Service
Phone		S(NB)		Bob Harshbarger	Puget Sound Energy
	A			Hasnah Mat-Amin alt. for Michelle Mizumori	Western Electricity Coordinating Council
					WEQ TRANSMISSION SEGMENT
					Muni/Coop
					Fed/State/Prov.
					IOU
					IOU
					at large
					at large
					At-Large
WEQ GENERATION SEGMENT					
Phone	O	S		William J. Gallagher	Vermont Public Power Supply Authority
Phone	S	S		Kathy York	Tennessee Valley Authority
Phone	O	S		John Ciza	Southern Company Services
Phone	S	S		Alan Johnson	NRG Energy, Inc.
		A(NB)		Trent Carlson	RRI Energy Services, Inc.
		S(NB)		Shah Hossain	Westar Energy, Inc.
					at large
					at large
WEQ MARKETERS/BROKERS SEGMENT					
Phone	O	S		Chris Norton	American Municipal Power, Inc.
					Muni/Coop

¹ Roll Call Simple Majority Vote

² Roll Call Simple Majority Vote



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NORTH AMERICAN ENERGY STANDARDS BOARD

REQ/WEQ EXECUTIVE COMMITTEE

Voting Record from June 16, 2010

VOTES = V		S – indicates an affirmative vote, O – indicates a vote in opposition, A – indicates an abstention, NB – indicates a vote cast through notational ballot and a blank cell indicates that the voter did not vote. The motions from which the voting results are detailed below are noted in the minutes.			
ATTENDANCE	V1 ¹	V2	V3 ²	V4	
Phone	S	S		Valerie Crockett alt. for B. Thornton	Tennessee Valley Authority
				Richard Lehman	Salt River Project
Phone	O	S		Joel Dison alt. for John Apperson	PacifiCorp Energy
Phone	S	S		Roy True	ACES Power Marketing
				Barry Green	Electric Power Supply Association (EPSA)
WEQ DISTRIBUTION/LOAD SERVING ENTITIES (LSE) SEGMENT					SUBSEGMENT:
				Ray Phillips	Alabama Municipal Electric Authority
Phone	O	S		Alan Pritchard	Duke Energy Corporation
Phone	O	S		Rufus D. Gladney	Consumers Energy Company
Phone	S	S		Robert Martinko	FirstEnergy Service Company
				Syd Berwager	Bonneville Power Administration
		S(NB)		Andy Rodriquez	NERC
WEQ END USERS SEGMENT					
				Aaron Breidenbaugh	EnerNOC, Inc.
		S(NB)		Lou Ann Westerfield	Idaho Public Utilities Commission, rep. National Association of Regulatory Utility Commissioners
Phone	S	S		Christopher Kotting	Public Utility Commission of Ohio
		S(NB)		Paul Sorenson	Open Access Technology International, Inc.
WEQ INDEPENDENT GRID OPERATORS/PLANNERS SEGMENT					
Phone	S	S		Cathy Wesley alt. for Thomas Bowe	PJM Interconnection
		S(NB)		Jim Castle	New York Independent System Operator, Inc.



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NORTH AMERICAN ENERGY STANDARDS BOARD

REQ/WEQ EXECUTIVE COMMITTEE

Voting Record from June 16, 2010

VOTES = V		S – indicates an affirmative vote, O – indicates a vote in opposition, A – indicates an abstention, NB – indicates a vote cast through notational ballot and a blank cell indicates that the voter did not vote. The motions from which the voting results are detailed below are noted in the minutes.			
ATTENDANCE	V1 ¹	V2	V3 ²	V4	
Phone	S	S			Eric Winkler alt. for Matt Goldberg Nancy Traweek Joel Mickey
					ISO New England, Inc. California ISO Electric Reliability Council of Texas
Phone	S	S			Ed Skiba
Phone	S	S			Charles Yeung
					Midwest ISO Southwest Power Pool
WEQ TECHNOLOGY AND SERVICES					
		S(NB)			Jim Buccigross 8760, INC
REQ SERVICE PROVIDERS/SUPPLIERS SEGMENT					
Phone			S	S	Bill Barkas Dominion Retail, Inc.
Phone			S	S	Neal Allen alt. for Jim Minneman Jennifer Teel
					PPL Solutions, LLC ista
Phone			A	S	Susan Munson Electric Reliability Council of Texas
REQ UTILITIES SEGMENT					
Phone			O	S	Phil Precht Patrick Eynon
					Baltimore Gas and Electric Company Ameren Services
Phone			S	S	Judy Ray
Phone			O	S	Michael J. Jesensky
					Alabama Power Company Dominion Resources Services, Inc.
END USER/PUBLIC AGENCIES SEGMENT					
Phone			O	S	Annunciata E. Marino Christopher Kotting
					Pennsylvania Public Utility Commission Public Utility Commission of Ohio



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Voting Results for Supermajority Votes

	Votes Possible	Votes Cast	Percentage Affirmative Votes Cast	Reaching the 40% Segment Affirmative Vote Threshold?	Motion Passing
V2 – SUPERMAJORITY	WEQ – 37	25 affirmative 1 abstention 0 opposed	68%	Y	Passes Super Majority Vote
V4 – SUPERMAJORITY	REQ – 10	7 affirmative 0 abstention 0 opposed	70%	Y	Passes Super Majority Vote



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7. Other Participants

Participant	Organization
John Apperson	PacifiCorp
Martin Bartel	Northeast Utilities
Jonathan Booe	NAESB
Martin Burns	Hypertek, Inc.
Ernie Cardone	New York ISO
Brent Hodges	Reliant
Dave Kaufman	Honeywell
Marie Knox	Midwest ISO
Ross Kovacs	Georgia Transmission Corporation
Debbie McKeever	Oncor
Rae McQuade	NAESB
Gregory Obenchain	EEI
Brad Ramsay	NARUC
Jim Reiley	Exelon Corporation
Veronica Thomason	NAESB
Steve Van Ausdall	Xtensible Solutions
Jill Vaughn	Court Reporter
David Wollman	NIST
Jimmy Womack	SPP



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NORTH AMERICAN ENERGY STANDARDS BOARD
2011 ANNUAL PLAN for the RETAIL GAS and ELECTRIC QUADRANTS
Approved by the Board of Directors on December 9, 2010 [With Proposed Changes from Retail Leadership](#)

Item Number & Description ¹	Completion ²	Assignment ³⁴
1. Develop Technical Electronic Implementation Standards and Data Dictionaries – Book 10: Customer Enrollment, Drop and Account Information Change		
a.. For the Distribution Company Registration Model Registration Agent Model Status: Not Started	2011	TEIS
2. Develop NAESB Certification checklist criteria for Retail Quadrants to be used in the NAESB Certification Program. The certification checklist may address test scripts, a checklist of items to be tested, data connectivity for test scripts and EDM testing. Status: Not Started. Dependent upon publication of Version 2.0 at a minimum, but more dependent upon completion of Customer Choice efforts, expected 1 st Q 2011 at the earliest.	2 nd Q, 2011	Ad Hoc EC Certification Group
3. Review and develop business practices standards to Demand Response, Demand Side Management and Energy Efficiency Programs Review and develop needed model business practices for a standardized method for quantifying benefits, savings, cost avoidance and/or the reduction in energy demand and usage derived from the implementation of demand side management and energy efficiency programs. This effort will include demand side response, energy efficiency programs and metering, including the 'curtailment service provider' program. The wholesale and retail demand response work groups and the Smart Grid Standards Subcommittees should actively and timely communicate and coordinate work products to ensure consistency between the three work groups. Each work group should take into account the work products developed by the other.		
a. Develop glossary for business practice standards Status: Ongoing	Ongoing	Joint WEQ/REQ DSM Subcommittee
b. Develop business practice standards used to measure and verify reductions in energy and demand from energy efficiency in wholesale and retail markets. ⁵ This includes developing business practice standards to measure and verify energy reductions for energy efficiency or a stand-alone Energy Efficiency Portfolio Standard. Status: Underway	2 nd Q, 2011	Joint WEQ/REQ DSM-EE Subcommittee
c. Develop business practice standards used to measure and verify reductions in energy and demand from energy efficiency in wholesale and retail markets. ⁶ This includes developing business practice standards to measure and verify energy reductions that are made to comply with a Renewable Portfolio Standard. Status: Not Started	4 th Q, 2011	REQ DSM-EE Subcommittee
d. Harmonize DSM-EE glossary with Retail Glossary Status: Ongoing	Ongoing	REQ/RGQ Glossary Subcommittee
4. Overview of Retail Gas and Retail Electric Quadrant Procedures		
a. Develop process flows and online navigational aids to support the procedures and to be provided as Retail orientation materials. Status: Not Started	2 nd Q, 2011	BPS



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Item Number & Description ¹	Completion ²	Assignment ³⁴
5. Additional Registration Agent Processes		
a. Review all existing Model Business Practices to determine if there are other Registration Agent Model processes not covered, and develop a prioritized list of those processes, if any. Status: Underway	2nd Q, 2011	BPS
b. Develop Model Business Practices and Process Flows for those Registration Agent Model processes on the prioritized list developed in (a) above, if any. Status: Underway	4 th Q, 2011	BPS
c. Develop Technical Electronic Implementation Standards and Data Dictionaries to support Model Business Practices of Book 14 – Service Requests, Disconnections and Reconnections in the registration Agent Model Status: Underway	2011	IR/TEIS
d. Develop Technical Electronic Implementation Standards and Data Dictionaries to support any Model Business Practices developed in (b) above Status: Underway	2011	IR/TEIS
6. Supplier Certification Develop practices to register/certify new Suppliers. Status: Underway	1 st Q, 2011	BPS
7. Supplier Marketing Practices Develop Model Business Practices providing for a “Consumer Disclosure Statement” to be presented to residential and small commercial customers describing the Supplier’s service offering and related contract provisions. This statement would also identify how certain Supplier-Customer interactions are conducted. Amongst the topics to be considered for inclusion on the statement would be the following: • the most important terms of the Supplier agreement, such as the contract’s term and termination fee provisions; • training and identification of Supplier marketing representatives; • protocols for Supplier in-person and telephone contacts with customers; • added measures for protecting non-English speaking customers; and • Processes for handling customer complaints and resolving disputes arising from Supplier marketing activities. Status: Underway	1 st Q, 2011	BPS



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Item Number & Description ¹	Completion ²	Assignment ³⁴
8 Develop Smart Grid Wholesale and Retail Electric Standards		
a. Harmonize Smart Grid glossary with Retail Glossary Status: Underway	Ongoing	REQ/RGQ Glossary Subcommittee
b. Develop standards to support PAP 10 – Standards Energy Usage Information		
i. Develop Information Model and related business practices – Phase 2, Harmonization with CIM and SEP 2.0 Status: Not Started, pending discussions with CIM and SEP 2.0	2011	Joint WEQ/REQ PAP 10 SGS Subcommittee
c. Develop standards to support inclusion of OpenADE requirements document into the NAESB Smart Grid standards (R10008), specifically to standardize the exchange of Energy Usage Information. Status: Underway	~~1st~~ <u>2nd</u> Q, 2011	REQ PAP 10 SGS Subcommittee Energy Services Provider Interface Task Force
<u>d. Develop retail electric model business practices for third party access to consumer smart grid data with considerations for data privacy practices those third parties should employ (R10012)</u> Status: Not Started	<u>TBD</u>	<u>REQ PAP 10 SGS Subcommittee Data Privacy Task Force</u>
9. Customer Information - Develop Model Business Practices and Process Flows to enable a Retail Customer, or a third party acting on behalf of the Retail Customer, to obtain the retail Customer's energy usage information on an on-going basis outside of a Smart Grid environment Status: Not Started	3 rd Q, 2011	BPS
10. Update Existing Model Business Practices – Review and update all existing Model Business Practices, filling in any gaps that may exist and making the language consistent throughout all Books.		
a. Book 1 – Market Participant Interactions Status: Not Started	1 st Q, 2011	BPS
b. Book 2 – Creditworthiness Status: Not Started	2 nd Q, 2011	BPS
c. Book 3 – Billing and Payments Status: Not Started	3 rd Q, 2011	BPS
d. Book 4 – Distribution Company – Supplier Disputes Status: Not Started	4 th Q, 2011	BPS
e. Book 8 – Customer Information Status: Not Started	4 th Q, 2011	BPS
f. Book 9 – Customer Billing and Payment Notification via Uniform Electronic Transactions Status: Not Started	2012	BPS
g. Book 10 – Customer Enrollment, Drop, and Account Information Change Status: Not Started	2012	BPS
h. Book 11 - Customer Enrollment, Drop, and Account Information Change Using a Registration Agent	2012	BPS



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Item Number & Description ¹	Completion ²	Assignment ³⁴
Status: Not Started		
i. Book 12 – Customer Inquiries	2012	BPS
Status: Not Started		
j. Book 14 – Service Request, Disconnection and Reconnection in the Registration Agent Model	2012	BPS
Status: Not Started		

Program of Standards Maintenance & Fully Staffed Standards Work⁷

Business Practice Requests	Ongoing	Assigned by the EC
Information Requirements and Technical Mapping of Business Practices	Ongoing	Assigned by the EC
Ongoing Interpretations for Clarifying Language Ambiguities	Ongoing	Assigned by the EC
Ongoing Maintenance of Code Values and Other Technical Matters	Ongoing	Assigned by the EC
Ongoing Development and Maintenance of Definitions	Ongoing	Glossary
Ongoing Development and Maintenance of Model Business Practices	Ongoing	BPS

Provisional Activities

Joint Effort:

- Modify TPA as necessary.
- Review security standards as may be deemed necessary, such as Public Key Infrastructure (PKI).
- Review and update the technical implementation of Book 3 – Billing and Payment.
- Develop XML transactions to support customer choice programs.

Retail Electric Quadrant Effort Only:

- Retail Meter Data Validation, Editing & Estimating: Develop procedures for ensuring the integrity and validity of retail customer metering data that is needed by utilities and suppliers for billing, etc. Issues related to unbundled or competitive metering are not to be considered.
- Settlement Process: Reconcile energy schedules and energy delivered by suppliers within a given market. Note: will need to be coordinated with the WEQ for the REQ.
- Develop business practice standards for cap and trade programs for green house gas.

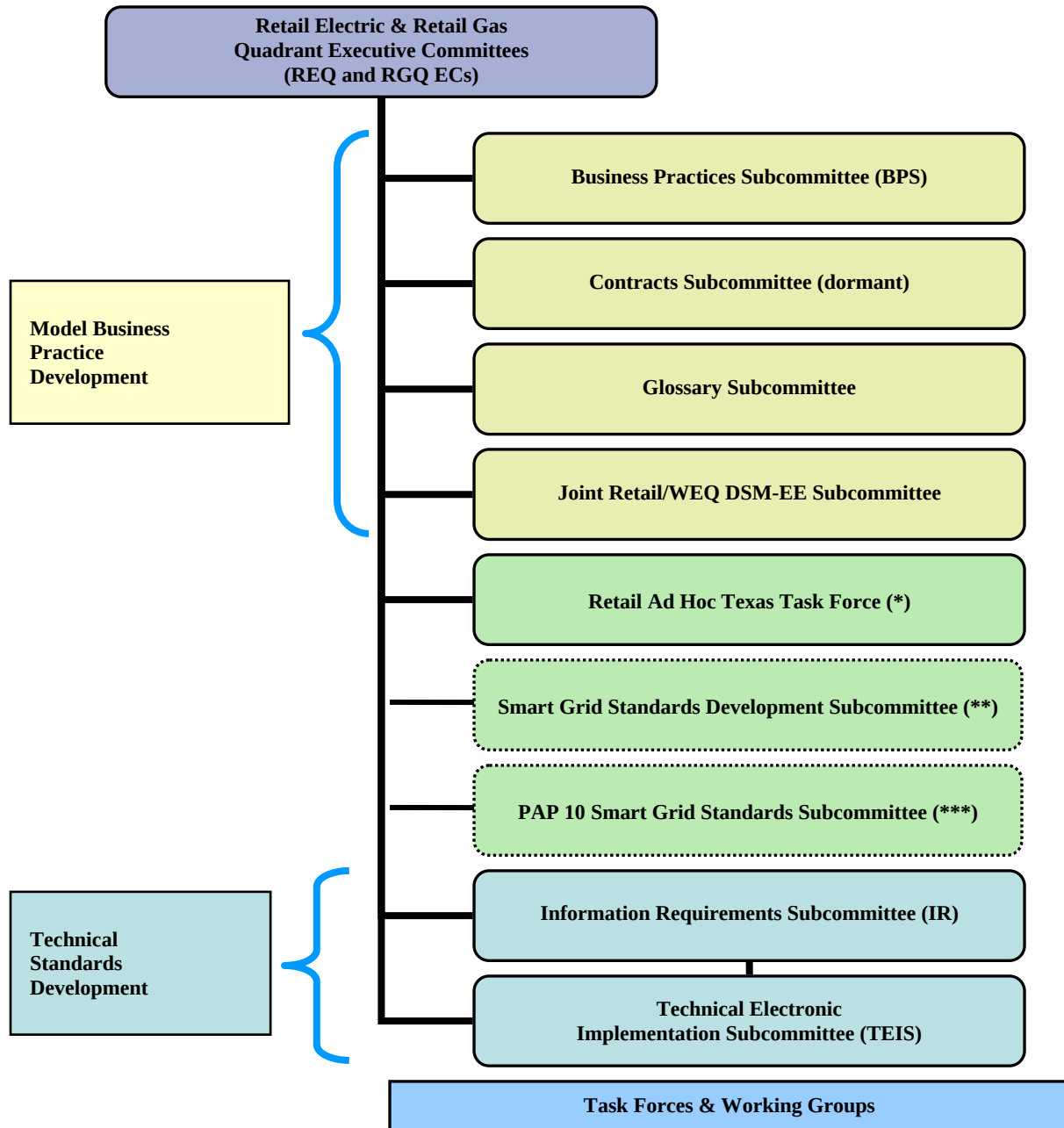
Retail Gas Quadrant Effort Only:

- Examine Wholesale Gas Quadrant Non-EDM Standards for applicability to retail business practices.
- Settlement Process: Reconcile energy schedules and energy delivered by suppliers within a given market.



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NAESB Retail Subcommittee Leadership: ⁸

Executive Committee: Mike Novak, Chair (RGQ), Phil Precht, Chair (REQ)

Business Practices Subcommittee: Phil Precht (REQ), Dan Jones (RGQ)

Information Requirements Subcommittee: Jennifer Teel (REQ)

Technical Electronic Implementation Subcommittee: Julie Compton-Pellizzi (RGQ)

Glossary Subcommittee: Patrick Eynon (REQ)

DSM-EE Subcommittee: Ruth Kiselewich, David Koogler (REQ), Roy True (WEQ), and Paul Wattles (WEQ)

Retail Ad Hoc Texas Task Force: Debbie McKeever (REQ) and Susan Munson (REQ)

(*) The Retail Ad Hoc Texas Task Force may draft MBPs, process flows, implementation guides and technical standards supportive of the Registration Agent. The group is chaired by Debbie McKeever and Susan Munson.

(**) The Smart Grid Standards Subcommittee is a joint group of the retail electric and wholesale electric quadrants with other standards development groups such as OASIS, CalConnect, FIX and UCAIug, and includes other groups. Direction may be given from NIST, DoE or FERC and the group reports jointly to the NAESB Board Smart Grid Strategic Steering Committee and the REQ EC. The group is chaired by Wayne Longcore, Joe Zhou and Robert Burke.

(***) The PAP 10 Smart Grid Standards Subcommittee is a joint group of the retail electric and wholesale electric quadrants with other standards development groups such as OASIS, UCAIug, OpenADE, ZigBee, ASHRAE, EIS Alliance, NARUC and includes other groups. Direction may be given from NIST, DoE or FERC and the group reports jointly to the NAESB Board Smart Grid Strategic Steering Committee and the REQ EC. The group is chaired by Phil Precht, Cathy Wesley, Sharon Dinges, David Kaufman, Brad Ramsay, Tobin Richardson and Ed Koch.

The PAP 10 Smart Grid Standards Subcommittee has created a Energy Services Providers Interface Task Force led by Dave Mollerstuen of Tendril, Steve Van Ausdall of Xtensible and Chad Maglaque of Xtreme Consulting Group to address the OpenADE request R10008.



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Retail 2011 Annual Plan End Notes:

¹ As outlined in the NAESB Bylaws, the REQ and RGQ will also address requests submitted by members and assigned to the REQ and RGQ through the Triage Process.

² Dates in the completion column are by end of the quarter for completion by the assigned committee. The dates do not necessarily mean that the standards are fully staffed to be implementable by the industry, and/or ratified by membership. If one item is completed earlier than planned, another item can begin earlier and possibly complete earlier than planned. There are no begin dates on the plan.

³ The assignments are abbreviated. The abbreviations and committee structure can be found at the end of the annual plan document.

⁴ The DSM-EE subcommittee has split into several separate groups to support concurrent development of separate standards sets.

⁵ Energy efficiency may be a wholesale product, such as capacity. Energy efficiency in retail markets may be from individual energy efficiency measures at the project level or a portfolio of projects that make up an energy efficiency program.

⁶ Energy efficiency may be a wholesale product, such as capacity. Energy efficiency in retail markets may be from individual energy efficiency measures at the project level or a portfolio of projects that make up an energy efficiency program.

⁷ This work is considered routine maintenance and thus the items are not separately numbered. The REQ and RGQ ECs will assign maintenance efforts on a request-by-request basis.

⁸ The ECs and the subcommittees can create task forces and working groups to support their development activities for development of model business practices and technical standards.



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(a)
Request Title: Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03

1. RECOMMENDED ACTION:

☒ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The NAESB Smart Grid Task Force (SGTF) submits this Recommendation that provides requirements for common pricing attributes that can be used as a basis for messaging protocols throughout the electrical energy system from producer through to a variety of energy consumers and the future intelligent devices employed by these consumers. These attributes are not meant to be a message protocol in and of themselves and further analysis and design work will be completed as part of several initiatives, such as ZigBee smart energy, OpenHAN, and OASIS¹ eMIX. These requirements should also be used as an input to the CIM maintained by UCAIug.

¹Reference to the Organization for the Advancement of Structured Information Standards not the Open Access Same-Time Information System



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(a)
Request Title: Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03

REQ.0

New Defined Terms to be added to REQ.0 in support of 2010 REQ AP Items 9(a-c)

(NOTE: NAESB Retail numbering convention will be applied in the final action. Many of the new terms are being used in the three PAP recommendations rather than duplicating the terms in multiple documents they are only listed in this recommendation)

Term	Definition
<u>Asset</u>	<u>A logical entity with measurable and reportable consumption, e.g. an Asset may be a physical device with its own meter, or the main meter at the Service Delivery Point of a Service Location</u>
<u>Asset Group</u>	<u>A logical entity that as a reportable interval level consumption, e.g. an Asset Group may be a physical entity with its own meter, a neighborhood of homes that has a net meter, or an estimate of consumption of an aggregation of Retail Customers</u>
<u>Service Delivery Point</u>	<u>The identifier of the location where electric service is delivered to the Service Location.</u>
<u>Service Location (was Facility in the Phase 1 ERD)</u>	<u>The physical location at which connection to the transmission or distribution system is made.</u>
<u>End Device (ED)</u>	<u>A physical end-use device that consumes or supplies electricity.</u>
<u>Premise</u>	<u>The location at which connection to the transmission or distribution system is made.</u>
<u>Response Method</u>	<u>A measurable action taken in response to an instruction to change consumption.</u>
<u>Response Method Aggregation (RMA)</u>	<u>A logical entity that has a reportable interval level consumption, e.g. an RMA may be a physical entity with its own meter, a neighborhood of homes that has a net meter, or an estimate of consumption of an aggregation of retail customers.</u>

RECOMMENDED MODEL BUSINESS PRACTICES:



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(a)
Request Title: Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03

Executive Summary

Specifications for Common Electricity Product and Pricing Definition

The following addresses the business objectives and context for capturing the attributes associated with electricity price and product signals as part of the Smart Grid implementation, which is called for by NIST PAP 03. ~~The NAESB SGTF in cooperation with UCAIug, OpenSG Task Force, the IRC Council, and other organizations, has developed the~~ The use cases that provide requirements for electricity price and product signal Model Business Practices.

~~Because the NAESB SGTF is involved in activities related to several of NIST's PAPs, the SGTF has developed a standard list of actors and related objects for all PAP work coming out of the group. These Model Business Practices also contains an overview of the most common retail rate structures and price-related use cases. Finally, a representative list of price and product attributes is provided. To maintain consistency between this Model Business Practice and related Model Business Practices developed for NIST PAP 04 and PAP 09, a master list of data elements, and common sets of actors terms and definitions are being recommended.~~

The following deals exclusively with the pricing related requirements at both the wholesale and retail levels. The requirements are captured in the form of UML models, where business requirements are captured in use case narrative format and data requirements are captured in tabular format. The main use cases that are affected by pricing are:

- Demand Response
- Non-Price (Environmental) Response
- Load-follower
- Price-takers

~~Reliability based responses, both wholesale and retail, is addressed by PAP-09 on DR Signaling.~~

Introduction

Specifications for Common Electricity Product and Pricing Definition

Purpose: The purpose of the following is to capture business and data requirements related to the definition of a common model for capturing the attributes of an electricity product offered at wholesale and/or retail level. Such attributes will mainly include but are not limited to the pricing information of the product being offered to the end consumers of electricity.

The use cases included in these Business Practice Standards are not to be required or exhaustive and are provided for clarification purposes.

Scope: The scope of the following is to provide business and data requirements, not implementation, of a common pricing model for electricity product.



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(a)
Request Title: Phase Two Requirements Specification for
Common Electricity Product and Pricing
Definition – for NIST PAP03

The electricity rate design process is not included in the scope of these use cases.



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(a)
Request Title: Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03

Model Business Practices

REQ.15.1 Specifications for Common Electricity Product and Pricing Definition

REQ.15.1.1 ACTORS LIST

The actors listed in the table below are specific to this Model Business Practice and are a subset of the actors and related objects defined in REQ.0. Details on the relationships between the actors and related objects are further defined in Appendix A.

Actor Name	Actor ID ²	Examples
Communication Method	5.5	
Control	5.2	Premise, EMS, ESI or Gateway
System Operator	2.1	Market and system operators
End Device	4.5	Electric vehicle, or smart appliance, display
Load Serving Entity	3.2	
Measurement	5.1	Meter
Premise	4.3	Electricity consumer
Resource	4.1	DER
Service Provider	3.1	Retail service provider, demand response provider, dynamic price service provider
Transmission/ Distribution Service Provider	3.5	Utility distribution company
Utility Customer	2.4	Residential, industrial

² The Actor ID shown in the table refers to the item number of the corresponding actor or related object in the Entity-Relationship Diagram provided in Appendix A. Definitions of the actors and related objects are included in REQ.0.



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(a)
Request Title: Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03

Actor Name	Actor ID ²	Examples
Utility Distribution Operator	2.3	Distribution operator

REQ.15.1.2 USE CASE DATA CONSIDERATIONS

The following tariff rate types and product and pricing attributes were considered when developing the use cases included in this Model Business Practice.

REQ.15.1.2.1 Tariff Rate Types Considered for Use Cases

A tariff establishes the prices paid for the services received, and is based on a variety of factors including wholesale prices, quality and type of service and costs associated with transmission and distribution grid infrastructure and operation. The use cases in these Model Business Practices illustrate the high-level activities associated with publishing prices and how the information is used to evoke a change in consumption. For the use cases included below the following tariff rate types were considered:

Tariff Rate Type	Target Customers	Description
block rate	C&I, residential	An energy supply rate structure in which the per unit energy price increases or decreases for each successive block of energy consumed.
critical peak price	C&I, residential	A pricing structure in which the customer receives notification identifying a time interval, ("critical hours") during which special higher prices apply over and above whatever other rate they may be charged. Critical hours generally represent a small percentage of the hours in the year.
demand rate	Mainly for C&I customers, pilot for residential customers	A component of an energy supply rate structure based on the highest demand for electricity measured in a billing period.
day ahead market rate	C&I, residential	An energy supply rate structure, typically hourly, based on the day-ahead wholesale market price.



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Tariff Rate Type	Target Customers	Description
market clearing price for energy	C&I	An energy rate structure that allows for price changes every interval (e.g. 5 minutes, 15 minutes, hourly, etc.) based on real-time wholesale market prices.
peak time rebate	C&I, residential	An incentive rate in which the utility pays a rebate to customers who reduced demand during peak periods on critical days
real time price rate	C&I	An energy supply rate structure in which prices can vary, typically on an hourly basis, based on forecast (day-ahead) or actual (real-time) market conditions.
time of use rate	C&I, residential	An energy supply rate structure where the per unit charge (kWh or kW) varies according to the time of day. Time of use rates may have daily and seasonal variations.
variable peak pricing	C&I, residential	An energy supply rate structure that combines features of time of use and real time price structures to include the flexibility of market price variation and the fixed time periods of a time of use rate.



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REQ.15.1.2.2 Product and Pricing Attributes Considered for Use Cases

For the purpose of the development of the use cases in Model Business Practice REQ.15.2, the following price and product attributes were considered.

REQ.15.1.2.2.1 Product Identification

Attribute	Description	Considerations
<u>Product Name</u>	<u>An identifier for a particular electricity product offering: energy, capacity, ancillary services, etc.</u>	<u>Matches (Ref to Market Product in PAP 09 Wholesale)</u>
Product Identifier	<u>Identifies a Specific Product associated with a Price. ~~Energy, although largely a non-storable and transitory commodity, is nonetheless still a tradable and sellable entity. Any commodity benefits from having a unique identifier (external) that can unambiguously be used by consumers to identify what it is that they are purchasing.~~</u>	<u>Any commodity benefits from having a unique identifier (external) that can unambiguously be used by consumers to identify what it is that they are purchasing.</u> Examples of product identification scheme used in the financial world is the ISIN and stock ticker symbols used by exchanges. This not a transaction identifier – this would be an industry agreed upon identifier for a particular energy product offering.
Identifier Source <u>(product)</u>	Identification of the source of the Product Identifier.	In most systems there are competing or alternative product identification schemes. The Identifier Source references the product identification scheme for the Product Identifier.



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Attribute	Description	Considerations
Product Type	<u>Identifies the product and marketA product type.</u>	<u>Classifications used within industry for trading energy. Examples: PJM Energy, NYISO 10-min Spin, etcAttempt to fit the product type within already in place ontologies or product classifications used within industry for trading energy.</u>
Product Sub-Type	The sub-type of product	Products may be further divided into subtypes, for example reserve products may be 10-minute or 30-minute response.
<u>Source Location Identifier</u>	<u>The identifier of the source location of the product for which the price applies</u>	<u>Electric energy cost and value are greatly impacted by the distance between generation and consumption. Indicating the source of the generation is important in terms of pricing decisions on part of consumers and intermediaries.</u> <u>The use of source location would mainly be used for bilateral transactions.</u>
<u>Source Location Identifier Type</u>	<u>Type of location.</u>	<u>The mechanism used to identify location can be defined in multiple sources based upon specific usage from control areas to GPS coordinates it is anticipated that there may need to be more than one method to identify a geographical location.</u> <u>Where possible existing industry standards should be adopted to identify geographic locations.</u>



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Attribute	Description	Considerations
<u>Delivery Time</u>	<u>Time at which the product is available for physical consumption</u>	
<u>Delivery Interval</u>	<u>The duration over which the product is available for physical consumption</u>	
Unit of Measure ~~for~~ <u>Product</u>	Unit of measure <u>for</u> the <u>identified</u> product.	The unit of measure such as MWh or kWh. <u>May vary between markets.</u>
<u>Price Location</u>	<u>The location at which the price is applicable.</u>	

REQ.15.1.2.2.2 Pricing Attributes

Attribute	Description	Considerations
~~Total Product~~ Price	<u>The sum of all Price Component Values for a given product (Total Price). Total Price of the product at point of delivery</u>	Price is expressed as currency per unit of measure, i.e. quantity is not required, e.g. \$/MWh The sum of all Price Components must equal the <u>Total Product</u> Price.
Set of 1..n Price Components		
Price Component <u>Value</u>	A component of the price.	Price may have one or more components.
Price Component Type	<u>The portion of the price to which the corresponding value applies</u> ~~The type of Price Component~~	A standard set of price component types shall be enumerated, such as: - Wholesale electricity cost - Transmission costs - Distribution costs
Price Type	<u>Time characteristic of the price</u> ~~Type of price~~	A standard set of price types will need to be defined (<u>real time, 5 minute, day ahead, etc.</u>) ~~as examples for price types~~



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Attribute	Description	Considerations
<u>Product Price Factor</u>	<u>Terms of use attribute of Product Price</u>	<u>Examples: Price absolute, Price relative, Price multiplier</u>
Override Unit of Measure for the Product	<u>Alternative unit of measure applicable to a given transaction. Unit of measure which is used to determine the price</u>	<u>If this is used, then Unit of Measure is not applicable</u> <u>Alternative unit of measure used in calculating the price.</u>
Currency	Economic unit of exchange in which the total price and price components are stated (i.e. dollars, euros)	Currency is required to determine the units of measure of the Total Price and Price Components. The energy units of measure are defined by the Product Type.
~~Time and Interval~~	~~Interval of energy delivery~~	~~Timezone conventions and use need to be unambiguously defined.~~ ~~Daily blocks, hourly markets, 5 minute markets.~~ ~~A decision in how basic product information will reference and interact with the WS-Calendar initiative being completed as part of PAP-04.~~
~~Source Location Identifier~~	~~Location of the source of the electric energy~~	~~Electric energy cost and value are greatly impacted by the distance between generation and consumption. Indicating the source of the generation is important in terms of pricing decisions on part of consumers and intermediaries.~~ ~~The use of source location would mainly be used for bilateral transactions.~~



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Attribute	Description	Considerations
Source Location Identifier Type	Type of location:	The mechanism used to identify location can be defined in multiple sources based upon specific usage from control areas to GPS coordinates it is anticipated that there may need to be more than one method to identify a geographical location. Where possible existing industry standards should be adopted to identify geographic locations.

REQ.15.2 Product and Pricing Use Cases

REQ.15.2.1 USE CASE OVERVIEW

The use case modeling technique is used for capturing business and data requirements relative to electric product and price information. The relationships used in the use case diagrams are as follows:

- Generalization (line with triangle head): this indicates variations (sub-types) of the main use case.
- Precedes: this indicates a time sequence
- Invokes: this indicates a pre-condition or dependency

The use cases included in these Model Business Practices are not intended to be required or exhaustive and are provided for clarification purposes.



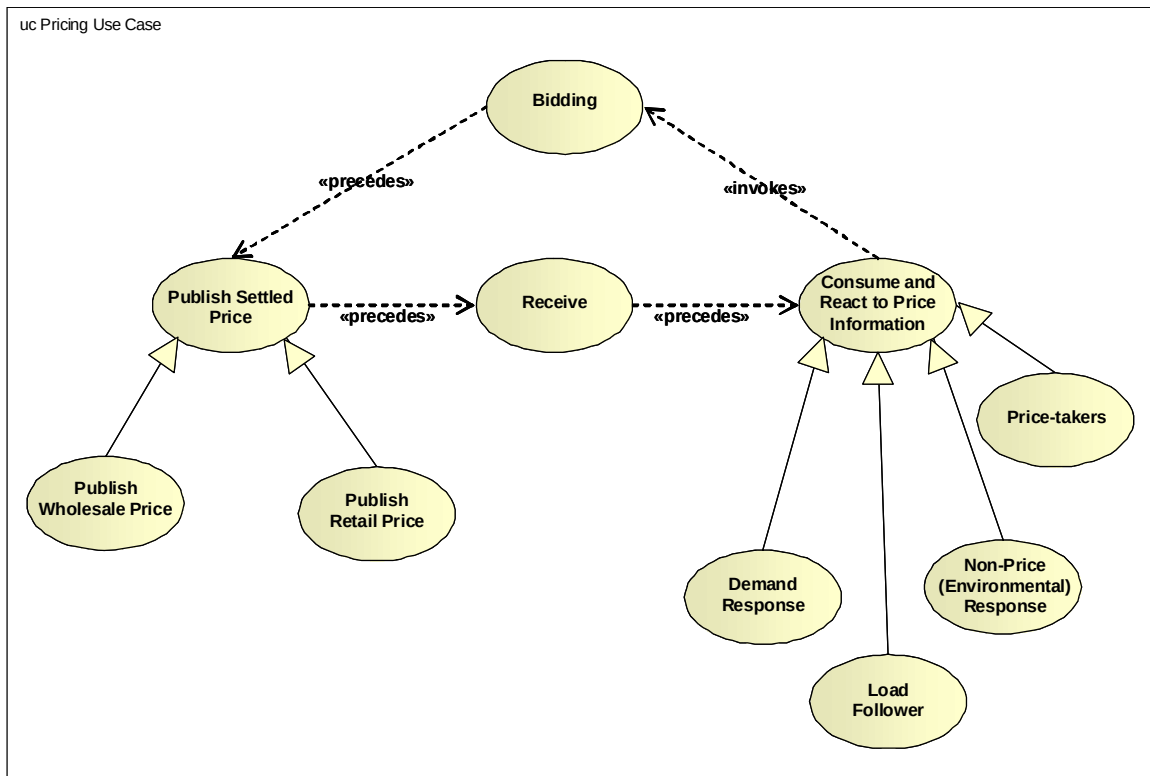
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REQ.15.2.2 PRICING USE CASE

The Pricing Use Case below provides an overview of the specific use cases described in these Model Business Practices. The results of bidding produce the settled price which is published and then received. The recipient reacts to the price, which affects the next bidding cycle. The following use cases where electricity pricing and product information can be used are described in these Model Business Practices:

- Demand response
- Non-Price (Environmental) Response
- Load-follower
- Price-takers





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REQ.15.2.3 SPECIFIC USE CASES

Specific use cases for what end use consumers of electricity might do when pricing signals are received are listed as follows:

Use Case	Actors	Description	SAMPLE Scenarios
Demand Response	SP ED Control Premise	Utility Customer (or device acting under UC direction) responds to Total Price or Price Component.	The System Operator published day-ahead prices which are statistically higher than average between 2:30 and 5:30 in the afternoon. Illustrate how different End Devices will respond to a forward energy price signal including: - An EMS requests BAS to “pre-cool” until 2:30 PM. - Home-based intelligent device is programmed to operate at a time when electricity is cheaper. An electric plug-in vehicle is programmed to charge when electricity is cheaper. A utility distribution company’s fixed time-of-day tariffs indicates higher price during day, and lower price after 11:00 PM. Demonstrate how different End Devices will response to price differentials: - Time-insensitive building systems schedule their run-time programs after 11:00 PM. Homeowner starts appliance at 5:10. The appliance notifies that by waiting 20 minutes to run, the consumer will get lower cost electricity. Homeowner acknowledges.
Non-Price (Environmental)	Resource ED	Product characteristics	Utility Customer sets a price threshold at which “green” power is



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Use Case	Actors	Description	SAMPLE Scenarios
Response	Premise	(other than price) are used to influence either the quantity or the time at which the customer uses electricity.	desirable. Above the “green price” the customer will take any power, below the “green price” the customer will choose suppliers with renewable portfolios. Test the scenario where, at 5:00 PM wind power picks up such that the price of power from renewable sources falls below the “green price” set by the customer. Utility delivers blend of 20% wind, 80% coal during this time of day at .10/kWh. 25% of customers indicate preference to buy pure wind, an over-subscription. Prices for pure wind are bid up to .15/kWh as the wind-sensitive market decreases. 20% of consumers pay the 50% premium to get only wind-only power. 1) Local PUC requires that segmentation be revenue-neutral, so bidding for wind power reduces undifferentiated power to .0875 kWh. 2) No bidding was required for undifferentiated power, so provider is incentivized to find additional sources of wind power. 3) Consumers unable to buy desired wind power reduce their aggregate demand. Consumers have programmed non-time-sensitive systems and appliances to not run when wind power is not available, time-shifting some demand until wind power is available at the desired price.



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Use Case	Actors	Description	SAMPLE Scenarios
Load-follower	DER UC		A UC is also a DER. The UC would purchase power up to the price at which the DER can economically produce power. The use case must prove that such a resource can receive enough information from the pricing signals to change its output according to the resource owner's price curve.
Price-taker	DER		A DER with no storage capability and zero fuel cost, such as a wind farm or solar array, will produce power at whatever the “market rate” for generation is at the time of production. The use case must prove that such a resource can identify its cost curve (zero in this case), supply energy to the grid, and get paid at the appropriate rate.



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REQ.15.A Appendix A – Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall information model for demand response. Figure 1A contains a data model used to illustrate the entity-relationships within the model.

Proper (and Improper) Usage of the Entity-Relationship Model. The entity-relationship model is used to show cardinality among objects in the model, for example every Resource belongs to one and only one Service Provider and a PremiseService Location contains one or more End-DevicesService Delivery Points. The entity-relationship model does not provide use case information; actors are objects in the model and do not “act” in the model. The entity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the enrollment of those Resources may be managed by a System Operators or a Utility Distribution Operator. Both use cases and process maps are separate components of the Model Business Practices.

Reading Crow’s Foot Notation. Objects in the model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow’s Foot notation, as documents in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a PremiseService Location is related to one-or-more End-DevicesService Delivery Points (reading top to bottom) and every End-DevicesService Delivery Points is related to exactly-one PremiseService Location (reading bottom to top).

~~**Optional Objects.** The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Premises, but does not require Response Method Aggregations and Response Methods. In this example, the relationship between Resource and Premise is transitive: a Resource is comprised of one-or-more Premises and each Premise is associated with zero-or-more Resources.~~

Optional Objects. The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.

Applicability to Retail and Wholesale. The entity-relationship model is applicable to both wholesale and retail. When using the model for wholesale, the applicable business entities are 2.1 (System Operator) and 2.3 (Market Participant), while in

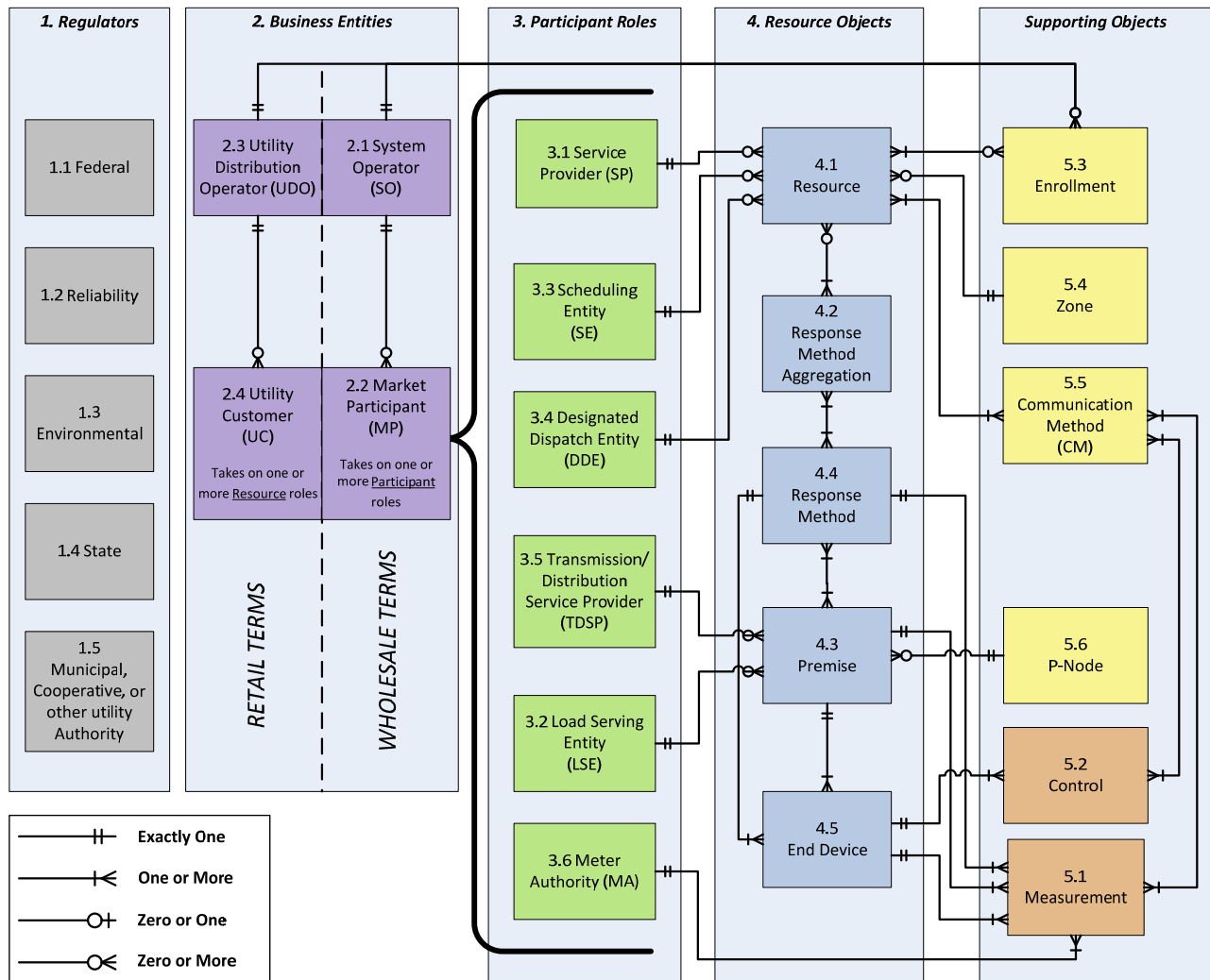


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retail markets, the parallel business entities are 2.3 (Utility Distribution Operator) and 2.4 (Utility Customers). Other than the swapping of the two pairs of terms, the models are identical, including the names of and relationships among objects.

Figure 1A. Entity-Relationship Model for Smart Grid Use Cases





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4. Supporting Documentation

a. Description of Request:

REQ Annual Plan Item 9(a) – “Develop Requirements and Use Cases for PAP 03 – Pricing Model”

b. Description of Recommendation:

This recommendation provides the data requirements related to the use cases developed as part of the phase one effort

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the development of common specification for electric price and production definition.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes – To be posted
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc
- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc
- September 9, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes – To be posted

Formal Comments Submitted by B. Bartell, Xtensible Solutions
On Smart Grid Phase 2 Retail PAP03, PAP04, and PAP09 Recommendations

From: Bruce Bartell

Sent: Monday, November 08, 2010 1:49 PM

To: naesbmail@naesb.org

Cc: Booe, Jonathan; Joe Zhou

Subject: FW: FW: REQ Request for Formal Comments - Smart Grid Phase 2 Recs. for SGIP PAPs 3, 4 and 9 - Due 11/15/10

Forwarding comments that I received regarding the Retail PAP03, PAP04, PAP09 Recommendations.

Bruce,

My feedback is outlined below. I have included additional people in this response who may want to add additional comment.

[Common Electricity Product and Pricing Definition](#) - In the first diagram for section REQ.15.2.2 PRICING USE CASE there is a subtlety that should be elaborated. Unless a customer is on RTP that actually reflects wholesale market prices (and SCE's does not), the DRP translates the wholesale market price into a DR price/event/dispatch signal that is actually relevant to the end customer. Therefore, in the diagram, the wholesale price would go to a DR Service Provider which would translate it into either a retail price or a DR event which the resource can then respond to. This translation from wholesale prices to retail prices or events via the DRP or LSE should be reflected throughout the document.

[Common Schedule Mechanism](#) - Looks good. Note that there could be some push back on the italics portion of the following (even though it is illustrative) as the DRPs interested in participating in CAISO want the opportunity for more than one service provider per customer:

Proper (and Improper) Usage of the Entity-Relationship Model. The entity-relationship model is used to show cardinality among objects in the model, for example every *Resource belongs to one and only one Service Provider* and a [Service Location](#) contains one or more [Service Delivery Points](#).

[Specifications for Retail Standard DR Signals](#) -

- *"Similar to DR resources, DER assets need to be registered and enrolled into a DR program."*

This is not necessarily true. For example, while a customer must obtain building permits to install solar PV on their home and they can apply for statewide rebates through SCE, they DO NOT *have to* be registered in an ongoing program. They can elect to be on a Net Energy Metering rate, but this is not required nor can it be monitored, policed or enforced.

BGE Comments



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1. RECOMMENDED ACTION:

☒ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The NAESB Smart Grid Task Force (SGTF) submits this Recommendation that provides requirements for common pricing attributes that can be used as a basis for messaging protocols throughout the electrical energy system from producer through to a variety of energy consumers and the future intelligent devices employed by these consumers. These attributes are not meant to be a message protocol in and of themselves and further analysis and design work will be completed as part of several initiatives, such as ZigBee smart energy, OpenHAN, and OASIS¹ eMIX. These requirements should also be used as an input to the CIM maintained by UCAIug.

¹Reference to the Organization for the Advancement of Structured Information Standards not the Open Access Same-Time Information System

BGE Comments



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REQ.0

New Defined Terms to be added to REQ.0 in support of 2010 REQ AP Items 9(a-c) *(This is incorrect. The Executive Committee, when it approved the original set of Model Business Practices did so specifically directing that the definitions would be identified as Technical Definitions. As such, they do not show in RXQ.0. Moved the below terms and definitions to the Technical Definitions section later in the document.)*

(NOTE: NAESB Retail numbering convention will be applied in the final action Many of the new terms are being used in the three PAP recommendations rather than duplicating the terms in multiple documents they are only listed in this recommendation)

Term	Definition
<u>Asset</u>	<u>A logical entity with measurable and reportable consumption, e.g. an Asset may be a physical device with its own meter, or the main meter at the Service Delivery Point of a Service Location</u>
<u>Asset Group</u>	<u>A logical entity that as a reportable interval level consumption, e.g. an Asset Group may be a physical entity with its own meter, a neighborhood of homes that has a net meter, or an estimate of consumption of an aggregation of Retail Customers</u>
<u>Service Delivery Point</u>	<u>The identifier of the location where electric service is delivered to the Service Location.</u>
<u>Service Location (was Facility in the Phase 1 ERD)</u>	<u>The physical location at which connection to the transmission or distribution system is made.</u>
<u>End Device (ED)</u>	<u>A physical end-use device that consumes or supplies electricity.</u>
<u>Premise</u>	<u>The location at which connection to the transmission or distribution system is made.</u>
<u>Response Method</u>	<u>A measurable action taken in response to an instruction to change consumption.</u>

BGE Comments



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Term	Definition
<u>Response Method Aggregation (RMA)</u>	<u>A logical entity that has a reportable interval level consumption, e.g. an RMA may be a physical entity with its own meter, a neighborhood of homes that has a net meter, or an estimate of consumption of an aggregation of retail customers.</u>

RECOMMENDED MODEL BUSINESS PRACTICES:

Specifications for Common Electricity Product and Pricing Definition

Executive Summary

Specifications for Common Electricity Product and Pricing Definition

~~The following~~This document addresses the business objectives and context for capturing the attributes associated with electricity price and product signals as part of the Smart Grid implementation, which is called for by National Institute of Science and Technology Priority Action Plan 03 (NIST PAP 03). ~~The NAESB SGTF in cooperation with UCAIug, OpenSG Task Force, the IRC Council, and other organizations, has developed the~~ The use cases ~~that~~ provide requirements for electricity price and product signal Model Business Practices.

~~Because the NAESB SGTF is involved in activities related to several of NIST's PAPs, the SGTF has developed a standard list of actors and related objects for all PAP work coming out of the group. These Model Business Practices also contains an overview of the most common retail rate structures and price-related use cases. Finally, a representative list of price and product attributes is provided. To maintain consistency between this these Model Business Practices and related Model Business Practices developed for NIST PAP 04 and PAP 09, a mMaster List of dData eElements, and common sets of actors terms and definitions are being recommended~~have been developed (REQ.20).

The following Model Business Practices ~~deals~~ exclusively with the pricing related requirements at ~~both the wholesale and retail levels, and have been developed in coordination and are consistent with Wholesale Electric Quadrant Standards.~~ The requirements are captured in the form of UML models, where business requirements are captured in use case narrative format and data requirements are captured in tabular format. The main use cases that are affected by pricing are:

- Demand Response
- Non-~~P~~price (~~E~~environmental) ~~R~~response (Not defined)
- Load-follower

BGE Comments



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- Price-takers

~~Reliability based responses, both wholesale and retail, is addressed by PAP-09 on DR Signaling.~~

Introduction

Specifications for Common Electricity Product and Pricing Definition (Redundant)

Purpose: The purpose of the ~~following Model Business Practices in this document~~ is to capture business and data requirements related to the definition of a common model for capturing the attributes of an electricity product offered at ~~wholesale and/or the~~ retail level. **(Generally do not refer to Wholesale in the Retail Document)** Such attributes will mainly include but are not limited to the pricing information of the product being offered to the end consumers of electricity.

~~The use cases included in these Business Practice Standards are not to be required or exhaustive and are provided for clarification purposes.~~

Scope: The scope of the following is to provide business and data requirements, not implementation, of a common pricing model for electricity product.

The electricity rate design process is not included in the scope of these use cases.

(Need to add the boiler-plate language)

The North American Energy Standards Board (NAESB) is a voluntary non-profit organization comprised of members from all aspects of the natural gas and electric industries. Within NAESB, the Retail Electric Quadrant (REQ) and the Retail Gas Quadrant (RGQ) focus on issues impacting the retail sale of energy to Retail Customers. REQ / RGQ Model Business Practices are intended to provide guidance to Distribution Companies, and other Market Participants involved in providing energy service to Retail Customers.

These Model Business Practices are voluntary and do not address policy issues that are the subject of state legislation or regulatory decisions. These Model Business Practices have been adopted with the realization that as the industry evolves, additional and amended Model Business Practices may be necessary. Any industry participant seeking additional or amended Model Business Practices (including principles, definitions, data elements, process descriptions, and technical implementation instructions) should submit a request to the NAESB office, detailing the change, so that the appropriate process may take place to amend the Model Business Practice.

BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(a)
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REQ.15.1 Principles - Reserved

REQ.15.2 Definitions

REQ.15.2.A Business Definitions

REQ.15.2.B Technical definitions

(NOTE: ~~NAESB Retail numbering convention will be applied in the final action~~ Many of the new terms below are being used in ~~the three PAP recommendations~~ REQ.15, REQ.16, REQ.17, and REQ.20. Rather than duplicating the terms in multiple documents they are only listed in this ~~recommendation~~ document, but they apply to all four documents.)

Term	Definition
<u>Asset</u>	<u>A logical entity with measurable and reportable consumption, e.g. an Asset may be a physical device with its own meter, or the main meter at the Service Delivery Point of a Service Location</u>
<u>Asset Group</u>	<u>A logical entity that as a reportable interval level consumption, e.g. an Asset Group may be a physical entity with its own meter, a neighborhood of homes that has a net meter, or an estimate of consumption of an aggregation of Retail Customers</u>
<u>Service Delivery Point</u>	<u>The identifier of the location where electric service is delivered to the Service Location.</u>
<u>Service Location (was Facility in the Phase 1 ERD)</u>	<u>The physical location at which connection to the transmission or distribution system is made.</u>
<u>End Device (ED)</u>	<u>A physical end-use device that consumes or supplies electricity.</u>
<u>Premise</u>	<u>The location at which connection to the transmission or distribution system is made.</u>
<u>Response Method</u>	<u>A measurable action taken in response to an instruction to change consumption.</u>

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Term	Definition
<u>Response Method Aggregation (RMA)</u>	<u>A logical entity that has a reportable interval level consumption, e.g. an RMA may be a physical entity with its own meter, a neighborhood of homes that has a net meter, or an estimate of consumption of an aggregation of retail customers.</u>

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Model Business Practices

REQ.15.13 Specifications for Common Electricity Product and Pricing Definition

REQ.15.13.1 ACTORS LIST

The actors listed in the table below are specific to ~~this~~ these Model Business Practices and those in REQ.16, REQ.17, and REQ.20 and are a subset of the actors and related objects defined in REQ.0. (This is not correct. Is there a larger set, and where is it located??) Details on the relationships between the actors and related objects are further defined in Appendix A (Why an Appendix? Why not another set Model Business Practices.).

(Changes in the table refer to existing defined terms)

Actor Name	Actor ID ²	Examples
Communication Method	5.5	
Control	5.2	Premise, EMS, ESI or Gateway
System Operator	2.1	Market and system operators
End Device	4.5	Electric vehicle, or smart appliance, display
Load Serving Entity	3.2	
Measurement	5.1	Meter
Premise	4.3	Electricity consumer
Resource	4.1	DER
Service Provider	3.1	Retail service provider, ~~d~~ <u>D</u> emand ~~r~~ <u>R</u> esponse provider, dynamic price service provider

² The Actor ID shown in the table refers to the item number of the corresponding actor or related object in the Entity-Relationship Diagram provided in Appendix A. Definitions of the actors and related objects are included in REQ.0.

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Actor Name	Actor ID ²	Examples
Transmission/ Distribution Service Provider	3.5	~~Utility~~ ~~d~~ Distribution ~~e~~ Company
~~Utility~~ <u>Retail</u> Customer	2.4	Residential, industrial
~~Utility~~ Distribution <u>Company</u> Operator	2.3	~~Distribution~~ ~~e~~ Operator <u>of a distribution system</u>

(Re; Distribution Company Operator, there is an existing term “Program Administrator”.
Will this fit ??)

REQ.15.~~31~~.2 USE CASE DATA CONSIDERATIONS

The following tariff rate types and product and pricing attributes were considered when developing the use cases included in ~~this~~ these Model Business Practices.

REQ.15.~~13~~.2.1 Tariff Rate Types Considered for Use Cases

A tariff establishes the prices paid for the services received, and is based on a variety of factors including wholesale prices, quality and type of service and costs associated with transmission and distribution grid infrastructure and operation. The use cases in these Model Business Practices illustrate the high-level activities associated with publishing prices and how the information is used to evoke a change in ~~consumption~~ usage. For the use cases included below the following tariff rate types were considered:

Tariff Rate Type	Target Customers	Description
block rate	C&I, residential	An energy supply rate structure in which the per unit energy price increases or decreases for each successive block of energy consumed.
~~e~~ Critical ~~p~~ Peak ~~price~~ <u>Pricing</u>	C&I, residential	A pricing structure in which the customer receives notification identifying a time interval, (“critical hours”) during which special higher prices apply over and above whatever other rate they may be charged. Critical hours generally represent a small

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Tariff Rate Type	Target Customers	Description
		percentage of the hours in the year. <u>(There is an existing definition. Need to use.)</u>
demand rate	Mainly for C&I customers, pilot for residential customers	A component of an energy supply rate structure based on the highest demand for electricity measured in a billing period.
day ahead market rate	C&I, residential	An energy supply rate structure, typically hourly, based on the day-ahead wholesale market price.
market clearing price for energy	C&I	An energy rate structure that allows for price changes every interval (e.g. 5 minutes, 15 minutes, hourly, etc.) based on real-time wholesale market prices.
peak time rebate	C&I, residential	An incentive rate in which the utility pays a rebate to customers who reduced demand during peak periods on critical days
~~#Real~~ ~~#Time~~ ~~price~~ ~~rate~~ Pricing	C&I	An energy supply rate structure in which prices can vary, typically on an hourly basis, based on forecast (day-ahead) or actual (real-time) market conditions. <u>(There is an existing definition. Need to use.)</u>
~~#Time of~~ ~~#Use~~ ~~Rates~~	C&I, residential	An energy supply rate structure where the per unit charge (kWh or kW) varies according to the time of day. Time of use rates may have daily and seasonal variations. <u>(There is an existing definition. Need to use.)</u>
variable peak pricing	C&I, residential	An energy supply rate structure that combines features of time of use and real time price structures to include the flexibility of market price variation and the fixed time periods of a time of use rate.

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REQ.15.13.2.2 Product and Pricing Attributes Considered for Use Cases

For the purpose of the development of the use cases in Model Business Practice REQ.15.23, the following price and product attributes were considered.

REQ.15.13.2.2.1 Product Identification

Attribute	Description	Considerations
<u>Product Name</u>	<u>An identifier for a particular electricity product offering: energy, capacity, ancillary services, etc.</u>	<u>Matches (Ref to Market Product in PAP 09 Wholesale)</u>
Product Identifier	~~Identifies a Specific Product associated with a Price. -Energy, although largely a non-storable and transitory commodity, is nonetheless still a tradable and sellable entity. Any commodity benefits from having a unique identifier (external) that can unambiguously be used by consumers to identify what it is that they are purchasing.~~	<u>Any commodity benefits from having a unique identifier (external) that can unambiguously be used by consumers-Retail Customers to identify what it is that they are purchasing.</u> Examples of product identification scheme used in the financial world is the ISIN and stock ticker symbols used by exchanges. This not a transaction identifier – this would be an industry agreed upon identifier for a particular energy product offering.
Identifier Source <u>(product)</u>	Identification of the source of the Product Identifier.	In most systems there are competing or alternative product identification schemes. The Identifier Source references the product identification scheme for the Product Identifier.

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Attribute	Description	Considerations
Product Type	<u>Identifies the product and market.</u> ~~A product type.~~	<u>Classifications used within industry for trading energy.</u> <u>Examples: PJM Energy, NYISO 10-min Spin, etc.</u> ~~Attempt to fit the product type within already in-place ontologies or product classifications used within industry for trading energy.~~
Product Sub-Type	The sub-type of product	Products may be further divided into subtypes, for example reserve products may be 10-minute or 30-minute response.
<u>Source Location Identifier</u>	<u>The identifier of the source location of the product for which the price applies</u>	<u>Electric energy cost and value are greatly impacted by the distance between generation and consumption/usage.</u> <u>Indicating the source of the generation is important in terms of pricing decisions on part of consumers-Retail Customers and intermediaries.</u> <u>The use of source location would mainly be used for bilateral transactions.</u>
<u>Source Location Identifier Type</u>	<u>Type of location.</u>	<u>The mechanism used to identify location can be defined in multiple sources based upon specific usage from control areas to GPS coordinates it is anticipated that there may need to be more than one method to identify a geographical location.</u> <u>Where possible existing industry standards should be adopted to identify geographic locations.</u>

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Attribute	Description	Considerations
<u>Delivery Time</u>	<u>Time at which the product is available for physical consumption</u>	
<u>Delivery Interval</u>	<u>The duration over which the product is available for physical consumption</u>	
Unit of Measure ~~for Product~~	Unit of measure <u>for</u> the <u>identified</u> product.	The unit of measure such as MWh or kWh. <u>May vary between markets.</u>
<u>Price Location</u>	<u>The location at which the price is applicable.</u>	

REQ.15.13.2.2.2 Pricing Attributes

Attribute	Description	Considerations
~~Total Product~~ Price	<u>The sum of all Price Component Values for a given product (Total Price). Total Price of the product at point of delivery</u>	Price is expressed as currency per unit of measure, i.e. quantity is not required, e.g. \$/MWh The sum of all Price Components must equal the <u>Total Product</u> Price.
Set of 1..n Price Components		
Price Component <u>Value</u>	A component of the price.	Price may have one or more components.
Price Component Type	<u>The portion of the price to which the corresponding value applies</u> ~~The type of Price Component~~	A standard set of price component types shall be enumerated, such as: - Wholesale electricity cost - Transmission costs - Distribution costs

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Attribute	Description	Considerations
Price Type	<u>Time characteristic of the price</u> ~~Type of price~~	A standard set of price types will need to be defined (real time, 5 minute, day ahead, etc.) ~~as examples for price types~~
<u>Product Price Factor</u>	<u>Terms of use attribute of Product Price</u>	<u>Examples: Price absolute, Price relative, Price multiplier</u>
Override Unit of Measure for the Product	<u>Alternative unit of measure applicable to a given transaction. Unit of measure which is used to determine the price</u>	<u>If this is used, then Unit of Measure is not applicable</u> ~~Alternative unit of measure used in calculating the price.~~
Currency	Economic unit of exchange in which the total price and price components are stated (i.e. dollars, euros)	Currency is required to determine the units of measure of the Total Price and Price Components. The energy units of measure are defined by the Product Type.
~~Time and Interval~~	~~Interval of energy delivery~~	~~Timezone conventions and use need to be unambiguously defined.~~ ~~Daily blocks, hourly markets, 5 minute markets.~~ ~~A decision in how basic product information will reference and interact with the WS-Calendar initiative being completed as part of PAP-04.~~
~~Source Location Identifier~~	~~Location of the source of the electric energy~~	~~Electric energy cost and value are greatly impacted by the distance between generation and consumption. Indicating the source of the generation is important in terms of pricing decisions on part of consumers and intermediaries.~~ ~~The use of source location would mainly be used for bilateral transactions.~~

BGE Comments



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Attribute	Description	Considerations
~~Source Location Identifier Type~~	~~Type of location:~~	~~The mechanism used to identify location can be defined in multiple sources based upon specific usage from control areas to GPS coordinates it is anticipated that there may need to be more than one method to identify a geographical location.~~ ~~Where possible existing industry standards should be adopted to identify geographic locations.~~

REQ.15.23.3 Product and Pricing Use Cases

REQ.15.23.3.1 USE CASE OVERVIEW

The use case modeling technique is used for capturing business and data requirements relative to electric product and price information. The relationships used in the use case diagrams are as follows:

- Generalization (line with triangle head): this indicates variations (sub-types) of the main use case.
- Precedes: this indicates a time sequence
- Invokes: this indicates a pre-condition or dependency

The use cases included in these Model Business Practices are not intended to be required or exhaustive and are provided for clarification purposes.

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RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

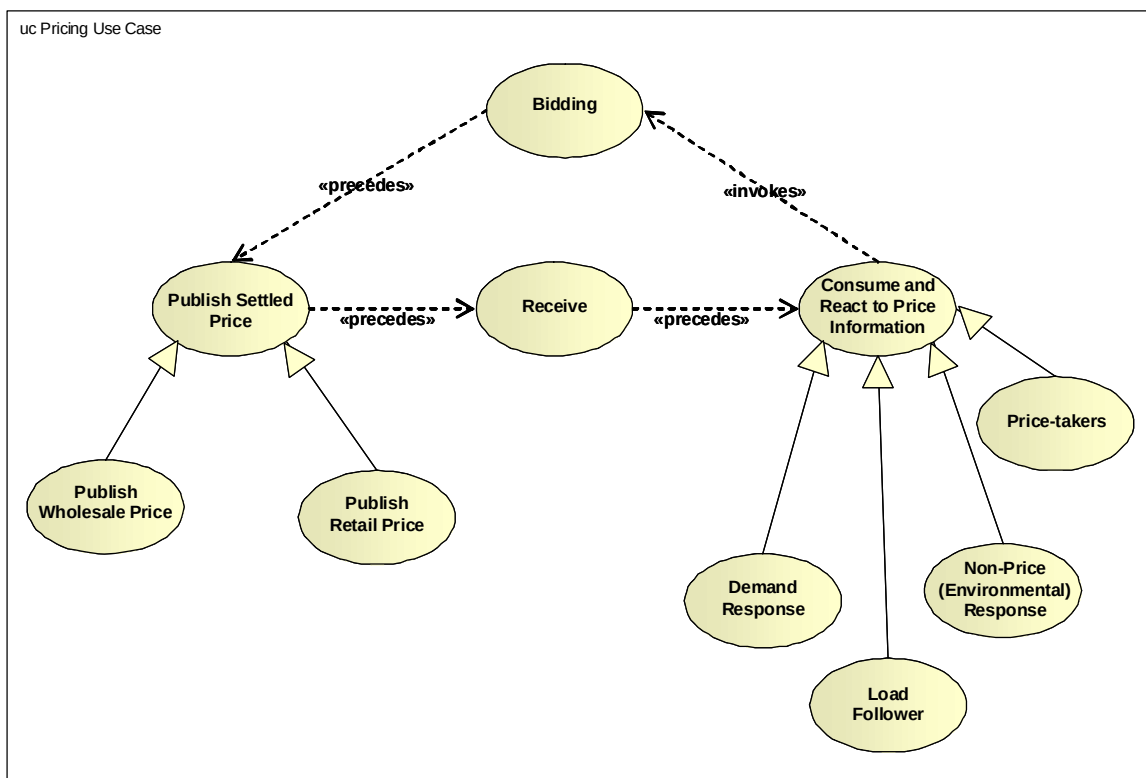
For Quadrant: Retail Electric Quadrant
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REQ.15.3.32.2

PRICING USE CASE

The Pricing Use Case below provides an overview of the specific use cases described in these Model Business Practices. The results of bidding produce the settled price which is published and then received. The recipient reacts to the price, which affects the next bidding cycle. The following use cases where electricity pricing and product information can be used are described in these Model Business Practices:

- Demand Response
- Non-Price (Environmental) Response
- Load-follower
- Price-takers



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REQ.15.23.3.3 SPECIFIC USE CASES

Specific use cases for what ~~end-use consumers~~ Retail Customers of electricity might do when pricing signals are received are listed as follows:

(High-lighted acronyms are not defined)

Use Case	Actors	Description	SAMPLE Scenarios
Demand Response	SP ED Control Premise	~~Utility-Retail~~ Customer (or device acting under ~~UC-RC~~ direction) responds to ~~T~~total ~~P~~price or ~~P~~price ~~C~~component.	The System Operator (~~WEQ term – does not fit here, or does it??~~) published day-ahead prices which are statistically higher than average between 2:30 and 5:30 in the afternoon. Illustrate how different ~~E~~end ~~D~~devices will respond to a forward energy price signal including: - An EMS requests BAS to “pre-cool” until 2:30 PM. - Home-based intelligent device is programmed to operate at a time when electricity is cheaper. An electric plug-in vehicle is programmed to charge when electricity is cheaper. A ~~utility-d~~istribution ~~e~~Company's fixed time-of-day tariffs indicates higher price during day, and lower price after 11:00 PM. Demonstrate how different ~~E~~end ~~D~~devices will ~~response-respond~~ to price differentials: - Time-insensitive building systems schedule their run-time programs after 11:00 PM. Homeowner starts appliance at 5:10. The appliance notifies that by waiting 20 minutes to run, the

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Use Case	Actors	Description	SAMPLE Scenarios
			consumer will get lower cost electricity. Homeowner acknowledges.
Non-Price (Environmental) Response	Resource ED Premise	Product characteristics (other than price) are used to influence either the quantity or the time at which the <u>retail eCustomer</u> uses electricity.	~~Utility-Retail~~ Customer sets a price threshold at which “green” power is desirable. Above the “green price” the <u>retail eCustomer</u> will take any power, below the “green price” the <u>Retail eCustomer</u> will choose suppliers with renewable portfolios. Test the scenario where, at 5:00 PM wind power picks up such that the price of power from renewable sources falls below the “green price” set by the <u>Retail eCustomer</u>. ~~Utility-Distribution Company~~ delivers blend of 20% wind, 80% coal during this time of day at .10/kWh. 25% of <u>Retail eCustomers</u> indicate preference to buy pure wind, an over-subscription. Prices for pure wind are bid up to .15/kWh as the wind-sensitive market decreases. 20% of ~~consumers-Retail Customers~~ pay the 50% premium to get only wind-only power. 1) ~~Local-PUC~~<u>Applicable Regulatory Authority</u> requires that segmentation be revenue-neutral, so bidding for wind power reduces undifferentiated power to .0875 kWh. 2) No bidding was required for undifferentiated power, so provider is incentivized to find additional sources of wind power. 3) ~~Consumers-Retail Customers~~ unable to buy desired wind

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Use Case	Actors	Description	SAMPLE Scenarios
			power reduce their aggregate ~~d~~ Demand. ~~Consumers-retail Customers~~ have programmed non-time-sensitive systems and appliances to not run when wind power is not available, time-shifting some ~~d~~ Demand until wind power is available at the desired price.
Load-follower	~~DER~~ ~~URC~~		A ~~URC~~ is also a ~~DER~~ . The ~~URC~~ would purchase power up to the price at which the ~~DER~~ can economically produce power. The use case must prove that such a resource can receive enough information from the pricing signals to change its output according to the resource owner's price curve.
Price-taker	~~DER~~		A ~~DER~~ with no storage capability and zero fuel cost, such as a wind farm or solar array, will produce power at whatever the "market rate" for generation is at the time of production. The use case must prove that such a resource can identify its cost curve (zero in this case), supply energy to the grid, and get paid at the appropriate rate.

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(Again, why an Appendix? Numbering suggestions if made a Model Business Practices)

REQ.15.A3.3.4 ~~Appendix A~~—Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall energy usage information model for dDemand rResponse. Figure 1A contains a data model used to illustrate the eEntity-relationships within the model.

REQ.15.3.3.4.1 **Proper (and Improper) Usage of the Entity-Relationship Model.** The eEntity-relationship model is used to show cardinality among objects in the model (What model ??), for example every Resource (Not defined) belongs to one and only one Service Provider and a PremiseService Location contains one or more End-DevicesService Delivery Points. The eEntity-relationship model does not provide use case information; actors are objects in the Entity-relationship model and do not “act” in the model. The eEntity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the eEnrollment of those Resources may be managed by a System Operators or a Utility Distribution Company Operator. Both use cases and process maps are separate components of the Model Business Practices.

REQ.15.3.3.4.2 **Reading Crow’s Foot Notation.** Objects in the Entity-relationship model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow’s Foot notation, as documented in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a PremiseService Location is related to one-or-more End-DevicesService Delivery Points (reading top to bottom) and every End-DevicesService Delivery Points is related to exactly-one PremiseService Location (reading bottom to top).

~~**Optional Objects.** The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Premises, but does not require Response Method Aggregations and Response Methods. In this example, the relationship between~~

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~~Resource and Premise is transitive: a Resource is comprised of one or more Premises and each Premise is associated with zero or more Resources.~~

REQ.15.3.3.4.3 **Optional Objects.** ~~The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the Entity-relationship model are considered optional. For example, a Utility-Distribution Company Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.~~

REQ.15.3.3.4.4 **Applicability to Retail and Wholesale.** The ~~e~~Entity-relationship model is applicable to both ~~w~~Wholesale Electric (WEQ) and ~~r~~Retail Electric Quadrants (REQ). When using the Entity-relationship model for ~~wholesale~~WEQ, the applicable business ~~e~~Entities are 2.1 (System Operator) and 2.3 (Market Participant), while in ~~retail markets~~REQ, the parallel business ~~e~~Entities are 2.3 (~~Utility-Distribution Company~~ Operator) and 2.4 (~~Utility-Retail~~ Customers). Other than the swapping of the two pairs of terms, the Entity-relationship models are identical, including the names of and relationships among objects.

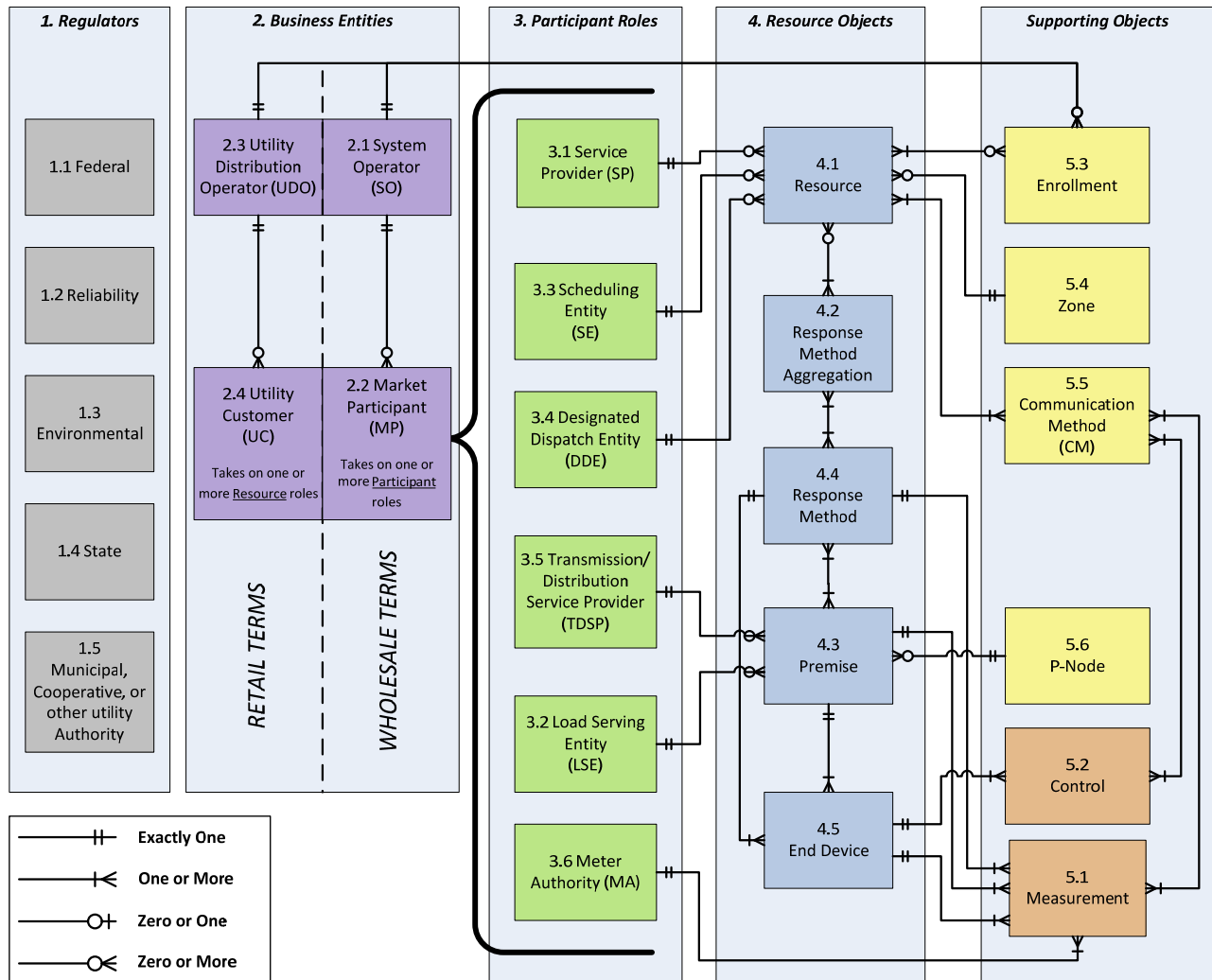
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Figure 1A. Entity-Relationship Model for Smart Grid Use Cases



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4. Supporting Documentation

a. Description of Request:

REQ Annual Plan Item 9(a) – “Develop Requirements and Use Cases for PAP 03 – Pricing Model”

b. Description of Recommendation:

This **Recommendation** provides the data requirements related to the use cases developed as part of the phase one effort

c. Business Purpose:

This **Recommendation** has been developed in response to a request from NIST to provide use cases and requirements germane to the development of common specification for electric price and production definition.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes – To be posted
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc
- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc
- September 9, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes – To be posted

C#	Company	Category	Cite
1	Trane - Ingersoll Rand (Sharon Dinges)	Editorial	Introduction
2	Trane - Ingersoll Rand (Sharon Dinges)	Editorial	Introduction, and REQ.15.2.1
3	Trane - Ingersoll Rand (Sharon Dinges)	Editorial	REQ.15.1.2.1
4	Trane - Ingersoll Rand (Sharon Dinges)	Editorial	REQ.15.1.2.2.1
5	Trane - Ingersoll Rand (Sharon Dinges)	Editorial	REQ.15.1.2.2.1 Source Location Identifier Type
6	Trane - Ingersoll Rand (Sharon Dinges)	Editorial	REQ.15.2.2

Suggested Change

Suggest changing: "... will mainly include but are not limited to the pricing" to will mainly include, but are not limited, to the pricing

Suggest modifying to: "Standards are not to be required, nor are should they be considered to be exhaustive and, are provided for clarification purposes, only."

Suggest modifying to: "... including wholesale prices, quality and type of service, and costs associated with..."

General comment - choose to either use a period (.) or not. The punctuation mixed, especially in the Description column

Suggest modifying to: "... areas to GPS coordinates. It is anticipated..."

"The results of bidding produce the settled price which is published and then received." is slightly ambiguous. Who is doing the publishing and who is doing the receiving? Suggest modifying to something such as: "The results of bidding produce the settled price which is published by the Service Provider, and then received by the Utility Customer." (I made assumptions on actors - modify with the appropriate pair of actors)

C#	Company	Category	Cite
1	Trane - Ingersoll Rand (Sharon Dinges)	Editorial	Control: The role associated with the control of an End Device.
2	Trane - Ingersoll Rand (Sharon Dinges)	Editorial	Measurement: The role associated with the device or algorithm that measures the consumption or supply of an End Device.
3	Trane - Ingersoll Rand (Sharon Dinges)	Editorial	Scheduling Entity(SE)
4	Trane - Ingersoll Rand (Sharon Dinges)	Editorial	Scheduling Entity(SE): A role which carries the responsibility of submitting bids/offers and receives schedules and awards.

Suggested Change

The term, "End Device" was removed from the Defined Terms document. As such, we should remove the capitalization in this definition for the term "Control"

The term, "End Device" was removed from the Defined Terms document. As such, we should remove the capitalization in this definition for the term "Measurement"

Add a space: "Scheduling Entity (SE)"

"... and receiving schedules and awards."



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(a)
Request Title: Phase Two Requirements Specifications for Common Electricity Product and Pricing Definition – for NIST PAP03

1. RECOMMENDED ACTION:

☒ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
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☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The NAESB Smart Grid Task Force (SGTF) submits this Recommendation that provides requirements specifications for common pricing attributes that can be used as a basis for messaging protocols throughout the electrical energy system from producer through to a variety of energy consumers and the future intelligent devices employed by these consumers. These attributes are not meant to be a message protocol in and of themselves and further analysis and design work will be completed as part of several initiatives, such as ZigBee smart energy, OpenHAN, and OASIS¹ eMIX. These requirements specifications should also be used as an input to the CIM maintained by UCAIug.

¹Reference to the Organization for the Advancement of Structured Information Standards not the Open Access Same-Time Information System



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REQ.0

New Defined Terms to be added to REQ.0 in support of 2010 REQ AP Items 9(a-c)

(NOTE: NAESB Retail numbering convention will be applied in the final action. Many of the new terms are being used in the three PAP recommendations rather than duplicating the terms in multiple documents they are only listed in this recommendation)

Term	Definition
Asset	A logical entity with measurable and reportable consumption, e.g. an Asset may be a physical device with its own meter, or the main meter at the Service Delivery Point of a Service Location
Asset Group	A logical entity that <u>has</u> a reportable interval level consumption, e.g. an Asset Group may be a physical entity with its own meter, a neighborhood of homes that has a net meter, or an estimate of consumption of an aggregation of Retail Customers
Service Delivery Point	The identifier of the location where electric service is delivered to the Service Location.
Service Location (was Facility in the Phase 1 ERD)	The physical location at which connection to the transmission or distribution system is made.

RECOMMENDED MODEL BUSINESS PRACTICES:

Executive Summary

Specifications for Common Electricity Product and Pricing Definition

The following addresses the business objectives and context for capturing the attributes associated with electricity price and product signals as part of the Smart Grid implementation, which is called for by NIST PAP 03. The use cases provide ~~requirements~~ specifications for electricity price and product signal Model Business Practices.

These Model Business Practices also contains an overview of the most common retail rate structures and price-related use cases. To maintain consistency between this Model Business Practice and related Model Business Practices developed for NIST PAP 04 and PAP 09, a master list of data elements, and common sets of actors terms and definitions are being recommended.



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The following deals exclusively with the pricing related requirements specifications at both the wholesale and retail levels. The requirements specifications are captured in the form of UML models, where business requirements specifications are captured in use case narrative format and data requirements elements are captured in tabular format. The main use cases that are affected by pricing are:

- Demand Response
- Non-Price (Environmental) Response
- Load-follower
- Price-takers

Introduction

Specifications for Common Electricity Product and Pricing Definition

Purpose: The purpose of the following is to capture business and data requirements elements related to the definition of a common model for capturing the attributes of an electricity product offered at wholesale and/or retail level. Such attributes will mainly include but are not limited to the pricing information of the product being offered to the end consumers of electricity.

The use cases included in these Business Practice Standards are not to be required or exhaustive and are provided for clarification informational purposes.

Scope: The scope of the following is to provide business and data requirements elements, not implementation, of a common pricing model for electricity product.

The electricity rate design process is not included in the scope of these use cases.

These Business Practice Standards and data elements included herein are not intended to (i) require the use of any of these data elements, (ii) require the provision or purchase of any products, programs, rates, markets or services, or (iii) supersede applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this standard.



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Model Business Practices

REQ.15.1 Specifications for Common Electricity Product and Pricing Definition

REQ.15.1.1 ACTORS LIST

The actors listed in the table below are specific to this Model Business Practice and are a subset of the actors and related objects defined in REQ.0. Details on the relationships between the actors and related objects are further defined in Appendix A.

Actor Name	Actor ID ²	Examples
Communication Method	5.5	
Control	5.2	Premise, EMS, ESI or Gateway
System Operator	2.1	Market and system operators
End Device	4.5	Electric vehicle, or smart appliance, display
Load Serving Entity	3.2	
Measurement	5.1	Meter
Premise	4.3	Electricity consumer
Resource	4.1	DER
Service Provider	3.1	Retail service provider, demand response provider, dynamic price service provider
Transmission/ Distribution Service Provider	3.5	Utility distribution company
Utility Customer	2.4	Residential, industrial

² The Actor ID shown in the table refers to the item number of the corresponding actor or related object in the Entity-Relationship Diagram provided in Appendix A. Definitions of the actors and related objects are included in REQ.0.



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Actor Name	Actor ID ²	Examples
Utility Distribution Operator	2.3	Distribution operator

REQ.15.1.2 USE CASE DATA CONSIDERATIONS

The following tariff rate types and product and pricing attributes were considered when developing the use cases included in this Model Business Practice.

REQ.15.1.2.1 Tariff Rate Types Considered for Use Cases

A tariff establishes the prices paid for the services received, and is based on a variety of factors including wholesale prices, quality and type of service and costs associated with transmission and distribution grid infrastructure and operation. The use cases in these Model Business Practices illustrate the high-level activities associated with publishing prices and how the information is used to evoke a change in consumption. For the use cases included below the following tariff rate types were considered:

Tariff Rate Type	Target Customers	Description
block rate	C&I, residential	An energy supply rate structure in which the per unit energy price increases or decreases for each successive block of energy consumed.
critical peak price	C&I, residential	A pricing structure in which the customer receives notification identifying a time interval, ("critical hours") during which special higher prices apply over and above whatever other rate they may be charged. Critical hours generally represent a small percentage of the hours in the year.
demand rate	Mainly for C&I customers, pilot for residential customers	A component of an energy supply rate structure based on the highest demand for electricity measured in a billing period.
day ahead market rate	C&I, residential	An energy supply rate structure, typically hourly, based on the day-ahead wholesale market price.



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Tariff Rate Type	Target Customers	Description
market clearing price for energy	C&I	An energy rate structure that allows for price changes every interval (e.g. 5 minutes, 15 minutes, hourly, etc.) based on real-time wholesale market prices.
peak time rebate	C&I, residential	An incentive rate in which the utility pays a rebate to customers who reduced demand during peak periods on critical days
real time price rate	C&I	An energy supply rate structure in which prices can vary, typically on an hourly basis, based on forecast (day-ahead) or actual (real-time) market conditions.
time of use rate	C&I, residential	An energy supply rate structure where the per unit charge (kWh or kW) varies according to the time of day. Time of use rates may have daily and seasonal variations.
variable peak pricing	C&I, residential	An energy supply rate structure that combines features of time of use and real time price structures to include the flexibility of market price variation and the fixed time periods of a time of use rate.



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REQ.15.1.2.2 Product and Pricing Attributes Considered for Use Cases

For the purpose of the development of the use cases in Model Business Practice REQ.15.2, the following price and product attributes were considered.

REQ.15.1.2.2.1 Product Identification

Attribute	Description	Considerations
Product Name	An identifier for a particular electricity product offering: energy, capacity, ancillary services, etc.	Matches (Ref to Market Product in PAP 09 Wholesale)
Product Identifier	Identifies a Specific Product associated with a Price.	Any commodity benefits from having a unique identifier (external) that can unambiguously be used by consumers to identify what it is that they are purchasing. Examples of product identification scheme used in the financial world is the ISIN and stock ticker symbols used by exchanges. This not a transaction identifier – this would be an industry agreed upon identifier for a particular energy product offering.
Identifier Source (product)	Identification of the source of the Product Identifier.	In most systems there are competing or alternative product identification schemes. The Identifier Source references the product identification scheme for the Product Identifier.
Product Type	Identifies the product and market	Classifications used within industry for trading energy. Examples: PJM Energy, NYISO 10-min Spin, etc.



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Attribute	Description	Considerations
Product Sub-Type	The sub-type of product	Products may be further divided into subtypes, for example reserve products may be 10-minute or 30-minute response.
Source Location Identifier	The identifier of the source location of the product for which the price applies	Electric energy cost and value are greatly impacted by the distance between generation and consumption. Indicating the source of the generation is important in terms of pricing decisions on part of consumers and intermediaries. The use of source location would mainly be used for bilateral transactions.
Source Location Identifier Type	Type of location.	The mechanism used to identify location can be defined in multiple sources based upon specific usage from control areas to GPS coordinates. <u>It</u> is anticipated that there may need to be more than one method to identify a geographical location. Where possible existing industry standards should be adopted to identify geographic locations.
Delivery Time	Time at which the product is available for physical consumption	
Delivery Interval	The duration over which the product is available for physical consumption	
Unit of Measure	Unit of measure for the identified product.	The unit of measure such as MWh or kWh. May vary between markets.



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Attribute	Description	Considerations
Price Location	The location at which the price is applicable.	

REQ.15.1.2.2.2 Pricing Attributes

Attribute	Description	Considerations
Product Price	The sum of all Price Component Values for a given product (Total Price).	Price is expressed as currency per unit of measure, i.e. quantity is not required, e.g. \$/MWh The sum of all Price Components must equal the Product Price.
Set of 1..n Price Components		
Price Component Value	A component of the price.	Price may have one or more components.
Price Component Type	The portion of the price to which the corresponding value applies	A standard set of price component types ~~shall~~ <u>should</u> be enumerated, such as: - Wholesale electricity cost - Transmission costs - Distribution costs
Price Type	Time characteristic of the price	A standard set of price types will need to be defined (real time, 5 minute, day ahead, etc.)
Product Price Factor	Terms of use attribute of Product Price	Examples: Price_absolute, Price_relative, Price_multiplier
Override Unit of Measure for the Product	Alternative unit of measure applicable to a given transaction.	If this is used, then Unit of Measure is not applicable



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Attribute	Description	Considerations
Currency	Economic unit of exchange in which the total price and price components are stated (i.e. dollars, euros)	Currency is required to determine the units of measure of the Total Price and Price Components. The energy units of measure are defined by the Product Type.

REQ.15.2 Product and Pricing Use Cases

REQ.15.2.1 USE CASE OVERVIEW

The use case modeling technique is used for capturing business and data ~~requirements~~ elements relative to electric product and price information. The relationships used in the use case diagrams are as follows:

- Generalization (line with triangle head): this indicates variations (sub-types) of the main use case.
- Precedes: this indicates a time sequence
- Invokes: this indicates a pre-condition or dependency

The use cases included in these Model Business Practices are not intended to be required or exhaustive and are provided for ~~clarification~~ informational purposes.



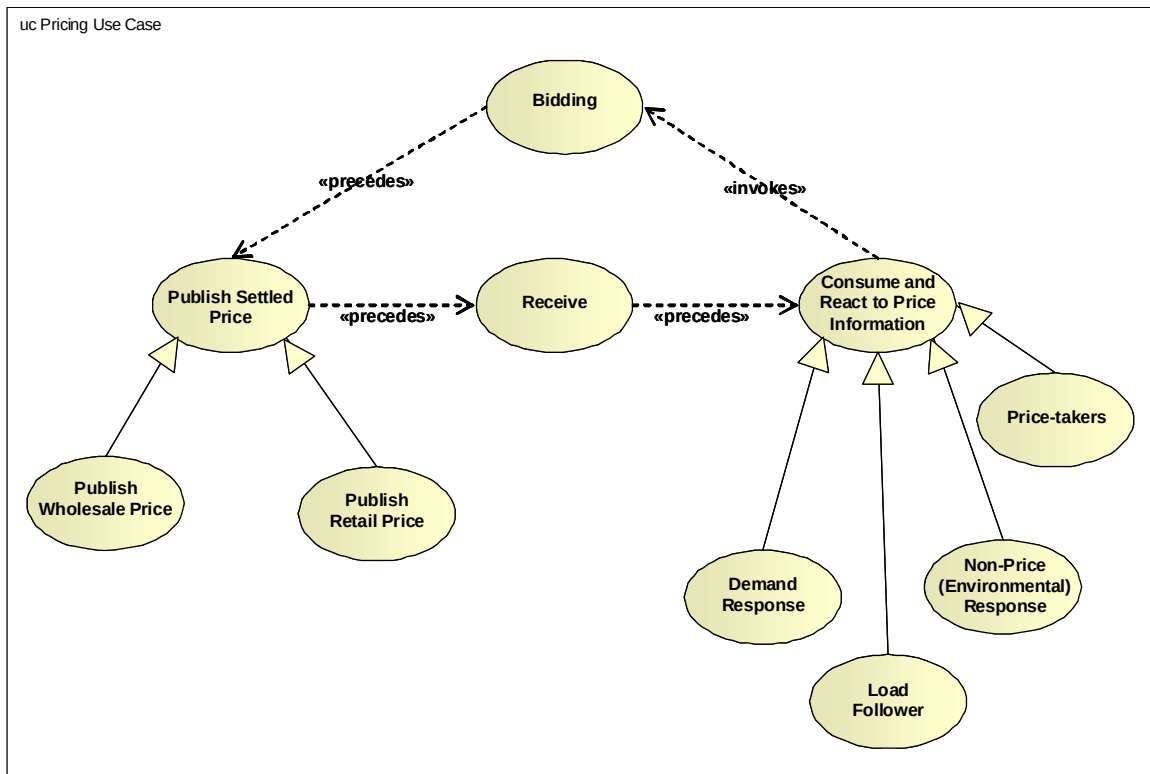
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REQ.15.2.2 PRICING USE CASE

The Pricing Use Case below provides an overview of the specific use cases described in these Model Business Practices. The results of bidding produce the settled price which is published and then received. The recipient reacts to the price, which affects the next bidding cycle. The following use cases where electricity pricing and product information can be used are described in these Model Business Practices:

- Demand response
- Non-Price (Environmental) Response
- Load-follower
- Price-takers





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REQ.15.2.3 SPECIFIC USE CASES

Specific use cases for what end use consumers of electricity might do when pricing signals are received are listed as follows:

Use Case	Actors	Description	SAMPLE Scenarios
Demand Response	SP ED Control Premise	Utility Customer (or device acting under UC direction) responds to Total Price or Price Component.	The System Operator published day-ahead prices which are statistically higher than average between 2:30 and 5:30 in the afternoon. Illustrate how different End Devices <u>will/could</u> respond to a forward energy price signal including: - An EMS requests BAS to “pre-cool” until 2:30 PM. - Home-based intelligent device is programmed to operate at a time when electricity is cheaper. An electric plug-in vehicle is programmed to charge when electricity is cheaper. A utility distribution company’s fixed time-of-day tariffs indicates higher price during day, and lower price after 11:00 PM. Demonstrate how different End Devices <u>will/could</u> respond<u>se</u> to price differentials: - Time-insensitive building systems schedule their run-time programs after 11:00 PM. Homeowner starts appliance at 5:10. The appliance notifies that by waiting 20 minutes to run, the consumer will get lower cost electricity. Homeowner acknowledges.
Non-Price (Environmental)	Resource ED	Product characteristics	Utility Customer sets a price threshold at which “green” power is



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Use Case	Actors	Description	SAMPLE Scenarios
Response	Premise	(other than price) are used to influence either the quantity or the time at which the customer uses electricity.	desirable. Above the “green price” the customer will take any power, below the “green price” the customer will choose suppliers with renewable portfolios. Test the scenario where, at 5:00 PM wind power picks up such that the price of power from renewable sources falls below the “green price” set by the customer. Utility delivers blend of 20% wind, 80% coal during this time of day at .10/kWh. 25% of customers indicate preference to buy pure wind, an over-subscription. Prices for pure wind are bid up to .15/kWh as the wind-sensitive market decreases. 20% of consumers pay the 50% premium to get only wind-only power. 1) Local PUC <u>could</u> requires that segmentation be revenue-neutral, so bidding for wind power reduces undifferentiated power to .0875 kWh. 2) No bidding was required for undifferentiated power, so provider is incentivized to find additional sources of wind power. 3) Consumers unable to buy desired wind power reduce their aggregate demand. Consumers have programmed non-time-sensitive systems and appliances to not run when wind power is not available, time-shifting some demand until wind power is available at the desired price.



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Use Case	Actors	Description	SAMPLE Scenarios
Load-follower	DER UC		A UC is also a DER. The UC would purchase power up to the price at which the DER can economically produce power. The use case ~~must~~ <u>should</u> prove that such a resource can receive enough information from the pricing signals to change its output according to the resource owner's price curve.
Price-taker	DER		A DER with no storage capability and zero fuel cost, such as a wind farm or solar array, will produce power at whatever the "market rate" for generation is at the time of production. The use case ~~must~~ <u>should</u> prove that such a resource can identify its cost curve (zero in this case), supply energy to the grid, and get paid at the appropriate rate.



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REQ.15.A Appendix A – Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall information model for demand response. Figure 1A contains a data model used to illustrate the entity-relationships within the model.

Proper (and Improper) Usage of the Entity-Relationship Model. The entity-relationship model is used to show cardinality among objects in the model, for example every Resource belongs to one and only one Service Provider and a Service Location contains one or more Service Delivery Points. The entity-relationship model does not provide use case information; actors are objects in the model and do not “act” in the model. The entity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the enrollment of those Resources may be managed by a System Operators or a Utility Distribution Operator. Both use cases and process maps are separate components of the Model Business Practices.

Reading Crow’s Foot Notation. Objects in the model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow’s Foot notation, as documentededs in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a Service Location is related to one-or-more Service Delivery Points (reading top to bottom) and every Service Delivery Points is related to exactly-one Service Location (reading bottom to top).

Optional Entities, Roles and Objects. The entity-relationship model is designed to support multiple business models and not every business model will require all entities, roles and/or objects to function. Therefore, all-entities, roles and objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.

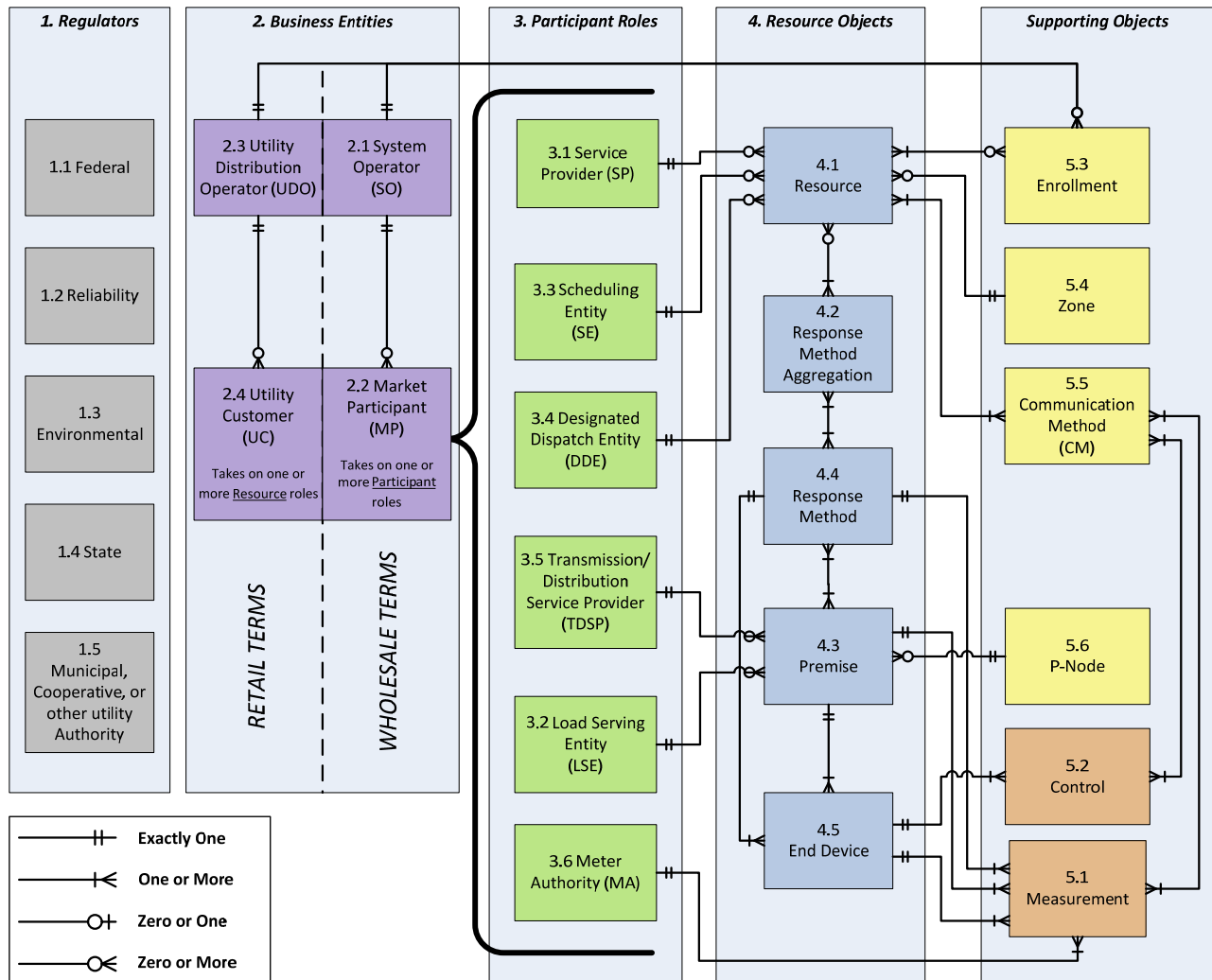
Applicability to Retail and Wholesale. The entity-relationship model is applicable to both wholesale and retail. When using the model for wholesale, the typical applicable business entities are 2.1 (System Operator) and 2.3 (Market Participant), while in retail markets, the parallel business entities are 2.3 (Utility Distribution Operator) and 2.4 (Utility Customers). Other than the swapping of the two pairs of terms, the models are identical, including the names of and relationships among objects.



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Figure 1A. Sample Entity-Relationship Model for Smart Grid Use Cases





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4. Supporting Documentation

a. Description of Request:

REQ Annual Plan Item 9(a) – “Develop Requirements and Use Cases for PAP 03 – Pricing Model”

b. Description of Recommendation:

This recommendation provides the data requirements elements related to the use cases developed as part of the phase one effort

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the development of common specification for electric price and production definition.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes – To be posted
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc
- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc
- September 9, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes – To be posted

C#	Company	Category	Cite
1	Cox Software Architects LLC	Technical	All documents in the public review starting October 15, 2010

Suggested Change

It is not clear (except in one footnote) that these requirements documents are not specification documents, i.e., that the structures, schemas, data element names and types, are requirements stated in very specific form. Add the following to the Executive Summary and the Introduction of each document: "All data element names, and implied or stated structures are not intended to specify specific message payloads or information object. The intent is to clearly specify the business information that is required to be exchanged to make effective and reasonable business decisions, and NAESB understands that standards that do not directly use such schemas and element names may conform to these requirements."



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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1. RECOMMENDED ACTION:

☒ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

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2. TYPE OF DEVELOPMENT/MAINTENANCE

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3. RECOMMENDATION

SUMMARY:

The NAESB Smart Grid Task Force (SGTF) submits this Recommendation that provides requirements-specifications for common pricing attributes that can be used as a basis for messaging protocols throughout the electrical energy system from producer through to a variety of energy consumers and the future intelligent devices employed by these consumers. These attributes are not meant to be a message protocol in and of themselves and further analysis and design work will be completed as part of several initiatives, such as ZigBee smart energy, OpenHAN, and OASIS¹ eMIX. These requirements-specifications should also be used as an input to the CIM maintained by UCAIug.

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REQ.0

New Defined Terms to be added to REQ.0 in support of 2010 REQ AP Items 9(a-c)

(NOTE: NAESB Retail numbering convention will be applied in the final action. Many of the new terms are being used in the three PAP recommendations rather than duplicating the terms in multiple documents they are only listed in this recommendation)

Term	Definition
<u>Asset</u>	<u>A logical entity with measurable and reportable consumption, e.g. an Asset may be a physical device with its own meter, or the main meter at the Service Delivery Point of a Service Location.</u>
<u>Asset Group</u>	<u>A logical entity that as a reportable interval level consumption, e.g. an Asset Group may be a physical entity with its own meter, a neighborhood of homes that has a net meter, or an estimate of consumption of an aggregation of Retail Customers.</u>
<u>Service Delivery Point</u>	<u>The identifier of the location where electric service is delivered to the Service Location.</u>
<u>Service Location (was Facility in the Phase 1 ERD)</u>	<u>The physical location at which connection to the transmission or distribution system is made.</u>
<u>End Device (ED)</u>	<u>A physical end-use device that consumes or supplies electricity.</u>
<u>Premise</u>	<u>The location at which connection to the transmission or distribution system is made.</u>
<u>Response Method</u>	<u>A measurable action taken in response to an instruction to change consumption.</u>
<u>Response Method Aggregation (RMA)</u>	<u>A logical entity that has a reportable interval level consumption, e.g. an RMA may be a physical entity with its own meter, a neighborhood of homes that has a net meter, or an estimate of consumption of an aggregation of retail customers.</u>

RECOMMENDED MODEL BUSINESS PRACTICES:



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for
Common Electricity Product and Pricing
Definition – for NIST PAP03

Specifications for Common Electricity Product and Pricing Definition

Executive Summary

Specifications for Common Electricity Product and Pricing Definition

The following addresses the business objectives and context for capturing the attributes associated with electricity price and product signals as part of the Smart Grid implementation, which is called for by NIST PAP 03. ~~The NAESB SGTF in cooperation with UCAIug, OpenSG Task Force, the IRC Council, and other organizations, has developed the~~ The use cases that provide ~~requirements-specifications~~ for electricity price and product signal Model Business Practices.

~~Because the NAESB SGTF is involved in activities related to several of NIST's PAPs, the SGTF has developed a standard list of actors and related objects for all PAP work coming out of the group. These Model Business Practices also contains an overview of the most common retail rate structures and price-related use cases. Finally, a representative list of price and product attributes is provided. To maintain consistency between this Model Business Practice and related Model Business Practices developed for NIST PAP 04 and PAP 09, a master list of data elements, and common sets of actors terms and definitions are being recommended.~~

The following deals exclusively with the pricing related ~~requirements-specifications~~ at both the wholesale and retail levels. The ~~requirements-specifications~~ are captured in the form of UML models, where business ~~requirements-specifications~~ are captured in use case narrative format and data ~~requirements-elements~~ are captured in tabular format. The main use cases that are affected by pricing are:

- Demand Response
- Non-Price (Environmental) Response
- Load-follower
- Price-takers

~~Reliability-based responses, both wholesale and retail, is addressed by PAP-09 on DR Signaling.~~

~~The intent is to clearly specify the business information that may be necessary to be exchanged to make effective and reasonable business decisions, standards or implementations that do not directly use such schemas and element names may conform to these requirements through clearly defined mapping documentation. All data element names and implied or stated structures are not intended to specify specific message payloads or information object. The intent is to clearly specify the business information that may be necessary to be exchanged to make effective and reasonable business decisions, and NAESB understands that standards that do not directly use such schemas and element names may conform to these requirements.~~

Introduction



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Specifications for Common Electricity Product and Pricing Definition

Purpose: The purpose of the following is to capture business and data ~~requirements~~ elements related to the definition of a common model for capturing the attributes of an electricity product offered at wholesale and/or retail level. Such attributes will mainly include, but are not limited to, the pricing information of the product being offered to the end consumers of electricity.

The use cases included in these Business Practice Standards are not to be required or exhaustive and are provided for ~~clarification~~ informational purposes.

Scope: The scope of the following is to provide business and data requirements, not implementation, of a common pricing model for electricity product.

The electricity rate design process is not included in the scope of these use cases.

These Business Practice Standards and data elements included herein are not intended to (i) require the use of any of these data elements, (ii) require the provision or purchase of any products, programs, rates, markets or services, or (iii) supersede applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this standard.

The North American Energy Standards Board (NAESB) is a voluntary non-profit organization comprised of members from all aspects of the natural gas and electric industries. Within NAESB, the Retail Electric Quadrant (REQ) and the Retail Gas Quadrant (RGQ) focus on issues impacting the retail sale of energy to Retail Customers. REQ / RGQ Model Business Practices are intended to provide guidance to Distribution Companies, and other Market Participants involved in providing energy service to Retail Customers.

These Model Business Practices are voluntary and do not address policy issues that are the subject of state legislation or regulatory decisions. These Model Business Practices have been adopted with the realization that as the industry evolves, additional and amended Model Business Practices may be necessary. Any industry participant seeking additional or amended Model Business Practices (including principles, definitions, data elements, process descriptions, and technical implementation instructions) should submit a request to the NAESB office, detailing the change, so that the appropriate process may take place to amend the Model Business Practice.

REQ.15.1 Principles - Reserved

REQ.15.2 Definitions

REQ.15.2.A Business Definitions



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REQ.15.2.B Technical definitions

(NOTE: NAESB Retail numbering convention will be applied in the final action Many of the new terms below are being used in the three PAP recommendationsREQ.15, REQ.16, REQ.17, and REQ.20. rRather than duplicating the terms in multiple documents they are only listed in this recommendationdocument, but they apply to all four documents.)

<u>Term</u>	<u>Definition</u>
<u>Asset</u>	<u>A logical entity with measurable and reportable consumption, e.g. an Asset may be a physical device with its own meter, or the main meter at the Service Delivery Point of a Service Location</u>
<u>Asset Group</u>	<u>A logical entity that as a reportable interval level consumption, e.g. an Asset Group may be a physical entity with its own meter, a neighborhood of homes that has a net meter, or an estimate of consumption of an aggregation of Retail Customers</u>
<u>Service Delivery Point</u>	<u>The identifier of the location where electric service is delivered to the Service Location.</u>
<u>Service Location (was Facility in the Phase 1 ERD)</u>	<u>The physical location at which connection to the transmission or distribution system is made.</u>
<u>End Device (ED)</u>	<u>A physical end-use device that consumes or supplies electricity.</u>
<u>Premise</u>	<u>The location at which connection to the transmission or distribution system is made.</u>
<u>Response Method</u>	<u>A measurable action taken in response to an instruction to change consumption.</u>
<u>Response Method Aggregation (RMA)</u>	<u>A logical entity that has a reportable interval level consumption, e.g. an RMA may be a physical entity with its own meter, a neighborhood of homes that has a net meter, or an estimate of consumption of an aggregation of retail customers.</u>



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Model Business Practices

REQ.15.31 Specifications for Common Electricity Product and Pricing Definition

REQ.15.31.1 ACTORS LIST

The actors listed in the table below are specific to this Model Business Practice and those in REQ.16, REQ.17 and REQ. are a subset of the actors and related objects defined in REQ.0. Details on the relationships between the actors and related objects are further defined in Appendix A.

Actor Name	Actor ID ²	Examples
Communication Method	5.5	
Control	5.2	Premise, EMS, ESI or Gateway
System Operator	2.1	Market and system operators
End Device	4.5	Electric vehicle, or smart appliance, display
Load Serving Entity	3.2	
Measurement	5.1	Meter
Premise	4.3	Electricity consumer
Resource	4.1	DER
Service Provider	3.1	Retail service provider, demand response provider, dynamic price service provider
Transmission/ Distribution Service Provider	3.5	Utility distribution company
Utility Customer	2.4	Residential, industrial

² The Actor ID shown in the table refers to the item number of the corresponding actor or related object in the Entity-Relationship Diagram provided in Appendix A. Definitions of the actors and related objects are included in REQ.0.



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Actor Name	Actor ID ²	Examples
Utility Distribution Operator	2.3	Distribution operator

REQ.15.13.2 USE CASE DATA CONSIDERATIONS

The following tariff rate types and product and pricing attributes were considered when developing the use cases included in this Model Business Practice.

REQ.15.13.2.1 Tariff Rate Types Considered for Use Cases

A tariff establishes the prices paid for the services received, and is based on a variety of factors including wholesale prices, quality and type of service and costs associated with transmission and distribution grid infrastructure and operation. The use cases in these Model Business Practices illustrate the high-level activities associated with publishing prices and how the information is used to evoke a change in consumption. For the use cases included below the following tariff rate types were considered:

Tariff Rate Type	Target Customers	Description
block rate	C&I, residential	An energy supply rate structure in which the per unit energy price increases or decreases for each successive block of energy consumed.
critical peak price	C&I, residential	A pricing structure in which the customer receives notification identifying a time interval, ("critical hours") during which special higher prices apply over and above whatever other rate they may be charged. Critical hours generally represent a small percentage of the hours in the year.
demand rate	Mainly for C&I customers, pilot for residential customers	A component of an energy supply rate structure based on the highest demand for electricity measured in a billing period.
day ahead market rate	C&I, residential	An energy supply rate structure, typically hourly, based on the day-ahead wholesale market price.

Late Comments Submitted by D. Pratt, J. Phillips and B. Bartell



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Tariff Rate Type	Target Customers	Description
market clearing price for energy	C&I	An energy rate structure that allows for price changes every interval (e.g. 5 minutes, 15 minutes, hourly, etc.) based on real-time wholesale market prices.
peak time rebate	C&I, residential	An incentive rate in which the utility pays a rebate to customers who reduced demand during peak periods on critical days
real time price rate	C&I	An energy supply rate structure in which prices can vary, typically on an hourly basis, based on forecast (day-ahead) or actual (real-time) market conditions.
time of use rate	C&I, residential	An energy supply rate structure where the per unit charge (kWh or kW) varies according to the time of day. Time of use rates may have daily and seasonal variations.
variable peak pricing	C&I, residential	An energy supply rate structure that combines features of time of use and real time price structures to include the flexibility of market price variation and the fixed time periods of a time of use rate.



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REQ.15.13.2.2 Product and Pricing Attributes Considered for Use Cases

For the purpose of the development of the use cases in Model Business Practice REQ.15.2, the following price and product attributes were considered.

REQ.15.13.2.2.1 Product Identification

Attribute	Description	Considerations
<u>Product Name</u>	<u>An identifier for a particular electricity product offering: energy, capacity, ancillary services, etc.</u>	<u>Matches (Ref to Market Product in PAP 09 Wholesale)</u>
Product Identifier	~~Identifies a Specific Product associated with a Price. Energy, although largely a non-storable and transitory commodity, is nonetheless still a tradable and sellable entity. Any commodity benefits from having a unique identifier (external) that can unambiguously be used by consumers to identify what it is that they are purchasing.~~	<u>Any commodity benefits from having a unique identifier (external) that can unambiguously be used by consumers to identify what it is that they are purchasing.</u> Examples of product identification scheme used in the financial world is the ISIN and stock ticker symbols used by exchanges. This not a transaction identifier – this would be an industry agreed upon identifier for a particular energy product offering.
Identifier Source <u>(product)</u>	Identification of the source of the Product Identifier.	In most systems there are competing or alternative product identification schemes. The Identifier Source references the product identification scheme for the Product Identifier.



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Attribute	Description	Considerations
Product Type	<u>Defines the source and productIdentifies the product and marketA product type.</u>	<u>Classifications used within industry for trading energy. Examples: PJM Energy, NYISO 10-min Spin, etcAttempt to fit the product type within already in place ontologies or product classifications used within industry for trading energy.</u>
Product Sub- ~~t~~ ype	<u>Used to further define product typesThe sub-type of product</u>	Products may be further divided into subtypes, for example reserve products may be 10-minute or 30-minute response.
<u>Source Location Identifier</u>	<u>The identifier of the source location of the product for which the price applies</u>	<u>Electric energy cost and value are greatly impacted by the distance between generation and consumption. Indicating the source of the generation is important in terms of pricing decisions on part of consumers and intermediaries.</u> <u>The use of source location would mainly be used for bilateral transactions.</u>
<u>Source Location Identifier Type</u>	<u>Type of location.</u>	<u>The mechanism used to identify location can be defined in multiple sources based upon specific usage from control areas to GPS coordinates it is anticipated that there may need to be more than one method to identify a geographical location.</u> <u>Where possible existing industry standards should be adopted to identify geographic locations.</u>

Late Comments Submitted by D. Pratt, J. Phillips and B. Bartell



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Attribute	Description	Considerations
<u>Delivery Time</u>	<u>Time at which the product is available for physical consumption</u>	
<u>Delivery Interval</u>	<u>The duration over which the product is available for physical consumption</u>	
Unit of Measure ~~for Product~~	<u>Attribute of Product Identifier</u> Unit of measure <u>for the identified product.</u>	The unit of measure such as MWh or kWh. May vary between markets.
<u>Price Location</u>	<u>The location at which the price is applicable.</u>	

REQ.15.13.2.2.2 Pricing Attributes

Attribute	Description	Considerations
~~Total Product~~ Price	<u>The sum of all Price Component Values for a given product (Total Price). Total Price of the product at point of delivery</u>	Price is expressed as currency per unit of measure, i.e. quantity is not required, e.g. \$/MWh The sum of all Price Components must equal the ~~Total Product~~ Price.
Set of 1..n Price Components		
Price Component <u>Value</u>	<u>The value of the price component. A component of the price.</u>	Price may have one or more components.
Price Component Type	<u>The portion of the price to which the corresponding value applies</u> ~~The type of Price Component~~	A standard set of price component types ~~shall~~ <u>should</u> be enumerated, such as: - Wholesale electricity cost - Transmission costs - Distribution costs
Price Type	<u>Time characteristic of the price</u> ~~Type of price~~	A standard set of price types will need to be defined (<u>real time, 5 minute, day ahead, etc.</u>) ~~as examples for price types~~



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Attribute	Description	Considerations
<u>Product Price Factor</u>	<u>Terms of use attribute of Product Price</u>	<u>Examples: Price absolute, Price relative, Price multiplier</u>
Override Unit of Measure for the Product	<u>Alternative unit of measure applicable to a given transaction. Unit of measure which is used to determine the price</u>	<u>If this is used, then Unit of Measure is not applicable. Alternative unit of measure used in calculating the price.</u>
Currency	Economic unit of exchange in which the total price and price components are stated (i.e. dollars, euros)	Currency is required to determine the units of measure of the Total Price and Price Components. The energy units of measure are defined by the Product Type.
~~Time and Interval~~	~~Interval of energy delivery~~	~~Timezone conventions and use need to be unambiguously defined. Daily blocks, hourly markets, 5 minute markets. A decision in how basic product information will reference and interact with the WS-Calendar initiative being completed as part of PAP-04.~~
~~Source Location Identifier~~	~~Location of the source of the electric energy~~	~~Electric energy cost and value are greatly impacted by the distance between generation and consumption. Indicating the source of the generation is important in terms of pricing decisions on part of consumers and intermediaries. The use of source location would mainly be used for bilateral transactions.~~



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Attribute	Description	Considerations
Source Location Identifier Type	Type of location:	The mechanism used to identify location can be defined in multiple sources based upon specific usage from control areas to GPS coordinates it is anticipated that there may need to be more than one method to identify a geographical location. Where possible existing industry standards should be adopted to identify geographic locations.

REQ.15.23.3 Product and Pricing Use Cases

REQ.15.23.3.1 USE CASE OVERVIEW

The use case modeling technique is used for capturing business and data requirements elements relative to electric product and price information. The relationships used in the use case diagrams are as follows:

- Generalization (line with triangle head): this indicates variations (sub-types) of the main use case.
- Precedes: this indicates a time sequence
- Invokes: this indicates a pre-condition or dependency

The use cases included in these Model Business Practices are not intended to be required or exhaustive and are provided for clarification informational purposes.



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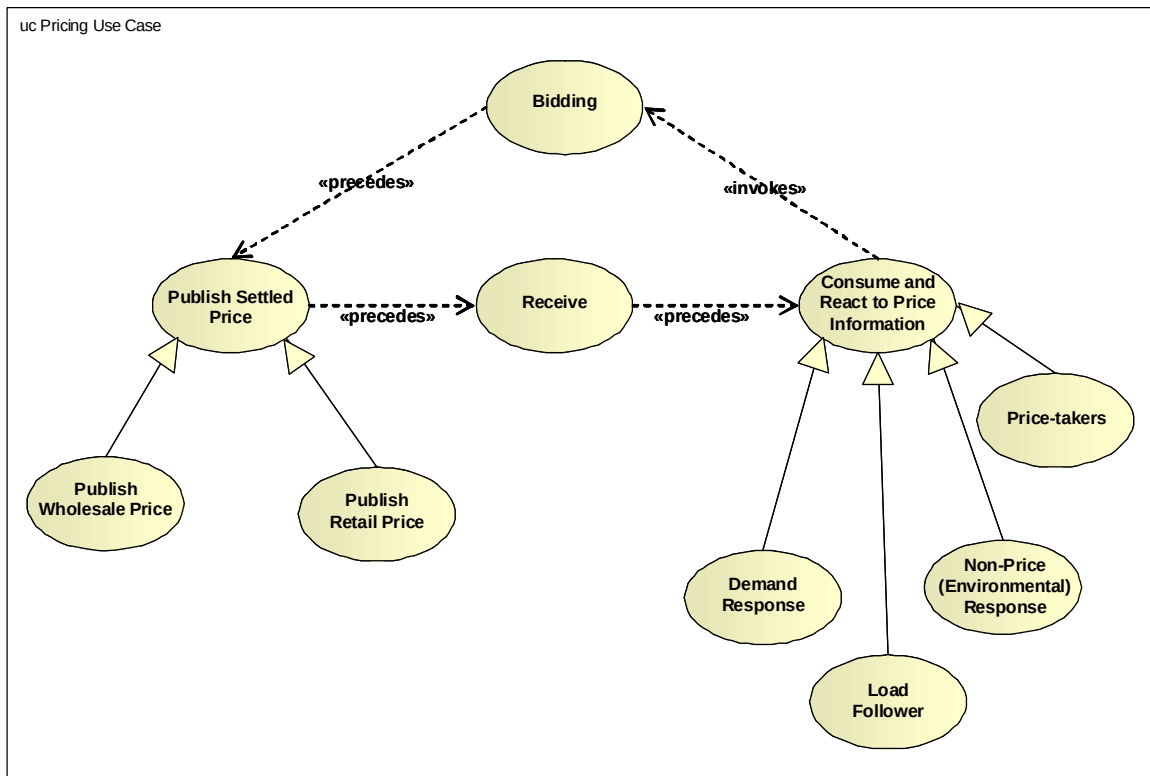
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REQ.15.23.3.2

PRICING USE CASE

The Pricing Use Case below provides an overview of the specific use cases described in these Model Business Practices. The results of bidding produce the settled price which is published and then received. The recipient reacts to the price, which affects the next bidding cycle. The following use cases where electricity pricing and product information can be used are described in these Model Business Practices:

- Demand response
- Non-Price (Environmental) Response
- Load-follower
- Price-takers





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REQ.15.23.3.3 SPECIFIC USE CASES

Specific use cases for what end use consumers of electricity might do when pricing signals are received are listed as follows:

Use Case	Actors	Description	SAMPLE Scenarios
Demand Response	SP ED Control Premise	Utility Customer (or device acting under UC direction) responds to Total Price or Price Component.	The System Operator published day-ahead prices which are statistically higher than average between 2:30 and 5:30 in the afternoon. Illustrate how different End Devices <u>will-could</u> respond to a forward energy price signal including: - An EMS requests BAS to “pre-cool” until 2:30 PM. - Home-based intelligent device is programmed to operate at a time when electricity is cheaper. An electric plug-in vehicle is programmed to charge when electricity is cheaper. A utility distribution company’s fixed time-of-day tariffs indicates higher price during day, and lower price after 11:00 PM. Demonstrate how different End Devices <u>will-could</u> respond<u>se</u> to price differentials: - Time-insensitive building systems schedule their run-time programs after 11:00 PM. Homeowner starts appliance at 5:10. The appliance notifies that by waiting 20 minutes to run, the consumer will get lower cost electricity. Homeowner acknowledges.
Non-Price (Environmental)	Resource ED	Product characteristics	Utility Customer sets a price threshold at which “green” power is



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Use Case	Actors	Description	SAMPLE Scenarios
Response	Premise	(other than price) are used to influence either the quantity or the time at which the customer uses electricity.	desirable. Above the “green price” the customer will take any power, below the “green price” the customer will choose suppliers with renewable portfolios. Test the scenario where, at 5:00 PM wind power picks up such that the price of power from renewable sources falls below the “green price” set by the customer. Utility delivers blend of 20% wind, 80% coal during this time of day at .10/kWh. 25% of customers indicate preference to buy pure wind, an over-subscription. Prices for pure wind are bid up to .15/kWh as the wind-sensitive market decreases. 20% of consumers pay the 50% premium to get only wind-only power. 1) Local PUC <u>could</u> requires that segmentation be revenue-neutral, so bidding for wind power reduces undifferentiated power to .0875 kWh. 2) No bidding was required for undifferentiated power, so provider is incentivized to find additional sources of wind power. 3) Consumers unable to buy desired wind power reduce their aggregate demand. Consumers have programmed non-time-sensitive systems and appliances to not run when wind power is not available, time-shifting some demand until wind power is available at the desired price.



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Use Case	Actors	Description	SAMPLE Scenarios
Load-follower	DER UC		A UC is also a DER. The UC would purchase power up to the price at which the DER can economically produce power. The use case must should prove that such a resource can receive enough information from the pricing signals to change its output according to the resource owner's price curve.
Price-taker	DER		A DER with no storage capability and zero fuel cost, such as a wind farm or solar array, will produce power at whatever the "market rate" for generation is at the time of production. The use case must should prove that such a resource can identify its cost curve (zero in this case), supply energy to the grid, and get paid at the appropriate rate.



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REQ.15.A Appendix A – Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall information model for demand response. Figure 1A contains a data model used to illustrate the entity-relationships within the model.

Proper (and Improper) Usage of the Entity-Relationship Model. The entity-relationship model is used to show cardinality among objects in the model, for example every Resource belongs to one and only one Service Provider and a PremiseService Location contains one or more End-DevicesService Delivery Points. The entity-relationship model does not provide use case information; actors are objects in the model and do not “act” in the model. The entity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the enrollment of those Resources may be managed by a System Operator or a Utility Distribution Operator. Both use cases and process maps are separate components of the Model Business Practices.

Reading Crow's Foot Notation. Objects in the model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow's Foot notation, as documentsed in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a PremiseService Location is related to one-or-more End-DevicesService Delivery Points (reading top to bottom) and every End-DevicesService Delivery Points is related to exactly-one PremiseService Location (reading bottom to top).

~~**Optional Objects.** The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Premises, but does not require Response Method Aggregations and Response Methods. In this example, the relationship between Resource and Premise is transitive: a Resource is comprised of one-or-more Premises and each Premise is associated with zero-or-more Resources.~~

~~**Optional Entities, Roles and Objects.** The entity-relationship model is designed to support multiple business models and not every business model will require all entities, roles and/or objects to function. Therefore, all entities, roles and objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.~~

Applicability to Retail and Wholesale. The entity-relationship model is applicable to both wholesale and retail. When using the model for wholesale, the typical applicable business entities are 2.1 (System Operator) and 2.3 (Market Participant), while in

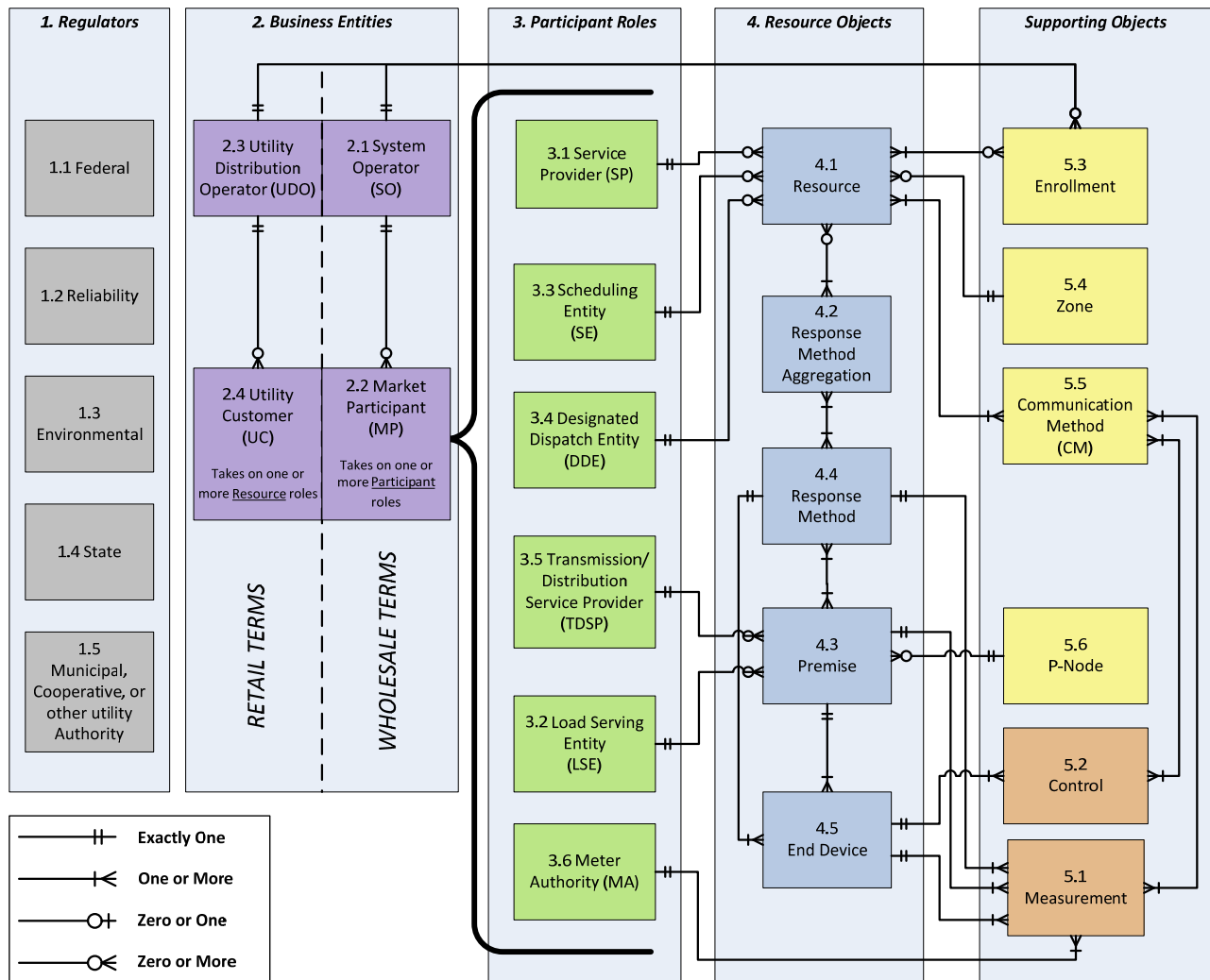


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retail markets, the parallel business entities are 2.3 (Utility Distribution Operator) and 2.4 (Utility Customers). Other than the swapping of the two pairs of terms, the models are identical, including the names of and relationships among objects.

Figure 1A. Sample Entity-Relationship Model for Smart Grid Use Cases





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4. Supporting Documentation

a. Description of Request:

REQ Annual Plan Item 9(a) – “Develop Requirements and Use Cases for PAP 03 – Pricing Model”

b. Description of Recommendation:

This recommendation provides the data elementrequirements related to the use cases developed as part of the phase one effort

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the development of common specification for electric price and production definition.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes – To be posted
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc
- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc
- September 9, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes – To be posted



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1. RECOMMENDED ACTION:

☒ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The NAESB Smart Grid Task Force (SGTF) submits this Recommendation that provides specifications for common pricing attributes that can be used as a basis for messaging protocols throughout the electrical energy system from producer through to a variety of energy consumers and the future intelligent devices employed by these consumers. These attributes are not meant to be a message protocol in and of themselves and further analysis and design work will be completed as part of several initiatives, such as ZigBee smart energy, OpenHAN, and OASIS¹ eMIX. These specifications should also be used as an input to the CIM maintained by UCAIug.

¹Reference to the Organization for the Advancement of Structured Information Standards not the Open Access Same-Time Information System



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03

RECOMMENDED MODEL BUSINESS PRACTICES:

Specifications for Common Electricity Product and Pricing Definition

Executive Summary

The following addresses the business objectives and context for capturing the attributes associated with electricity price and product signals as part of the Smart Grid implementation, which is called for by NIST PAP 03. The use cases provide specifications for electricity price and product signal Model Business Practices.

These Model Business Practices also contains an overview of the most common retail rate structures and price-related use cases. To maintain consistency between this Model Business Practice and related Model Business Practices developed for NIST PAP 04 and PAP 09, a master list of data elements, and common sets of actors terms and definitions are being recommended.

The following deals exclusively with the pricing related specifications at both the wholesale and retail levels. The specifications are captured in the form of UML models, where business specifications are captured in use case narrative format and data elements are captured in tabular format. The main use cases that are affected by pricing are:

- Demand Response
- Non-Price (Environmental) Response
- Load-follower
- Price-takers

The intent is to clearly specify the business information that may be necessary to be exchanged to make effective and reasonable business decisions. Standards or implementations that do not directly use such schemas and element names may conform to these requirements through clearly defined mapping documentation.

Introduction

Specifications for Common Electricity Product and Pricing Definition

Purpose: The purpose of the following is to capture business and data elements related to the definition of a common model for capturing the attributes of an electricity product offered at wholesale and/or retail level. Such attributes will mainly include, but are not limited to, the pricing information of the product being offered to the end consumers of electricity.



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The use cases included in these Business Practice Standards are not to be required or exhaustive and are provided for informational purposes.

Scope: The scope of the following is to provide business and data requirements, not implementation, of a common pricing model for electricity product.

The electricity rate design process is not included in the scope of these use cases.

These Business Practice Standards and data elements included herein are not intended to (i) require the use of any of these data elements, (ii) require the provision or purchase of any products, programs, rates, markets or services, or (iii) supersede applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this standard.

The North American Energy Standards Board (NAESB) is a voluntary non-profit organization comprised of members from all aspects of the natural gas and electric industries. Within NAESB, the Retail Electric Quadrant (REQ) and the Retail Gas Quadrant (RGQ) focus on issues impacting the retail sale of energy to Retail Customers. REQ / RGQ Model Business Practices are intended to provide guidance to Distribution Companies, and other Market Participants involved in providing energy service to Retail Customers.

These Model Business Practices are voluntary and do not address policy issues that are the subject of state legislation or regulatory decisions. These Model Business Practices have been adopted with the realization that as the industry evolves, additional and amended Model Business Practices may be necessary. Any industry participant seeking additional or amended Model Business Practices (including principles, definitions, data elements, process descriptions, and technical implementation instructions) should submit a request to the NAESB office, detailing the change, so that the appropriate process may take place to amend the Model Business Practice.

REQ.15.1 Principles - Reserved

REQ.15.2 Definitions

REQ.15.2.A Business Definitions



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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REQ.15.2.B Technical definitions

(NOTE: NAESB Retail numbering convention will be applied in the final action. Many of the new terms below are being used in the three PAP recommendations REQ.15, REQ.16, REQ.17, and REQ.20. Rather than duplicating the terms in multiple documents they are only listed in this recommendation document, but they apply to all four documents.)

Asset	A logical entity with measurable and reportable consumption, e.g. an Asset may be a physical device with its own meter, or the main meter at the Service Delivery Point of a Service Location
Asset Group	A logical entity that as a reportable interval level consumption, e.g. an Asset Group may be a physical entity with its own meter, a neighborhood of homes that has a net meter, or an estimate of consumption of an aggregation of Retail Customers
Service Delivery Point	The identifier of the location where electric service is delivered to the Service Location.
Service Location (was Facility in the Phase 1 ERD)	The physical location at which connection to the transmission or distribution system is made.



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REQ.15.3 Specifications for Common Electricity Product and Pricing Definition

REQ.15.3.1 ACTORS LIST

The actors listed in the table below are specific to this Model Business Practice and those in REQ.16, REQ.17 and REQ.. Details on the relationships between the actors and related objects are further defined in Appendix A.

Actor Name	Actor ID ²	Examples
Communication Method	5.5	
Control	5.2	Premise, EMS, ESI or Gateway
System Operator	2.1	Market and system operators
End Device	4.5	Electric vehicle, or smart appliance, display
Load Serving Entity	3.2	
Measurement	5.1	Meter
Premise	4.3	Electricity consumer
Resource	4.1	DER
Service Provider	3.1	Retail service provider, demand response provider, dynamic price service provider
Transmission/ Distribution Service Provider	3.5	Utility distribution company
Utility Customer	2.4	Residential, industrial

² The Actor ID shown in the table refers to the item number of the corresponding actor or related object in the Entity-Relationship Diagram provided in Appendix A. Definitions of the actors and related objects are included in REQ.0.



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Actor Name	Actor ID ²	Examples
Utility Distribution Operator	2.3	Distribution operator

REQ.15.3.2 USE CASE DATA CONSIDERATIONS

The following tariff rate types and product and pricing attributes were considered when developing the use cases included in this Model Business Practice.

REQ.15.3.2.1 Tariff Rate Types Considered for Use Cases

A tariff establishes the prices paid for the services received, and is based on a variety of factors including wholesale prices, quality and type of service and costs associated with transmission and distribution grid infrastructure and operation. The use cases in these Model Business Practices illustrate the high-level activities associated with publishing prices and how the information is used to evoke a change in consumption. For the use cases included below the following tariff rate types were considered:

Tariff Rate Type	Target Customers	Description
block rate	C&I, residential	An energy supply rate structure in which the per unit energy price increases or decreases for each successive block of energy consumed.
critical peak price	C&I, residential	A pricing structure in which the customer receives notification identifying a time interval, ("critical hours") during which special higher prices apply over and above whatever other rate they may be charged. Critical hours generally represent a small percentage of the hours in the year.
demand rate	Mainly for C&I customers, pilot for residential customers	A component of an energy supply rate structure based on the highest demand for electricity measured in a billing period.
day ahead market rate	C&I, residential	An energy supply rate structure, typically hourly, based on the day-ahead wholesale market price.



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Tariff Rate Type	Target Customers	Description
market clearing price for energy	C&I	An energy rate structure that allows for price changes every interval (e.g. 5 minutes, 15 minutes, hourly, etc.) based on real-time wholesale market prices.
peak time rebate	C&I, residential	An incentive rate in which the utility pays a rebate to customers who reduced demand during peak periods on critical days
real time price rate	C&I	An energy supply rate structure in which prices can vary, typically on an hourly basis, based on forecast (day-ahead) or actual (real-time) market conditions.
time of use rate	C&I, residential	An energy supply rate structure where the per unit charge (kWh or kW) varies according to the time of day. Time of use rates may have daily and seasonal variations.
variable peak pricing	C&I, residential	An energy supply rate structure that combines features of time of use and real time price structures to include the flexibility of market price variation and the fixed time periods of a time of use rate.



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REQ.15.3.2.2 Product and Pricing Attributes Considered for Use Cases

For the purpose of the development of the use cases in Model Business Practice REQ.15.2, the following price and product attributes were considered.

REQ.15.3.2.2.1 Product Identification

Attribute	Description	Considerations
Product Name	An identifier for a particular electricity product offering: energy, capacity, ancillary services, etc.	Matches (Ref to Market Product in PAP 09 Wholesale)
Product Identifier	Identifies a Specific Product associated with a Price.	Any commodity benefits from having a unique identifier (external) that can unambiguously be used by consumers to identify what it is that they are purchasing. Examples of product identification scheme used in the financial world <u>isare</u> the ISIN and stock ticker symbols used by exchanges. This not a transaction identifier – this would be an industry agreed upon identifier for a particular energy product offering.
Identifier Source (product)	Identification of the source of the Product Identifier.	In most systems there are competing or alternative product identification schemes. The Identifier Source references the product identification scheme for the Product Identifier.
Product Type	Defines the source and product	Classifications used within industry for trading energy. Examples: PJM Energy, NYISO 10-min Spin, etc.



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Attribute	Description	Considerations
Product Sub-type	Used to further define product types	Products may be further divided into subtypes, for example reserve products may be 10-minute or 30-minute response.
Source Location Identifier	The identifier of the source location of the product for which the price applies	Electric energy cost and value are greatly impacted by the distance between generation and consumption. Indicating the source of the generation is important in terms of pricing decisions on part of consumers and intermediaries. The use of source location would mainly be used for bilateral transactions.
Source Location Identifier Type	Type of location.	The mechanism used to identify location can be defined in multiple sources based upon specific usage from control areas to GPS coordinates. It is anticipated that there may need to be more than one method to identify a geographical location. Where possible existing industry standards should be adopted to identify geographic locations.
Delivery Time	Time at which the product is available for physical consumption	
Delivery Interval	The duration over which the product is available for physical consumption	
Unit of Measure	Attribute of Product Identifier.	The unit of measure such as MWh or kWh. May vary between markets.



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Attribute	Description	Considerations
Price Location	The location at which the price is applicable.	

REQ.15.3.2.2.2 Pricing Attributes

Attribute	Description	Considerations
Product Price	The sum of all Price Component Values for a given product (Total Price).	Price is expressed as currency per unit of measure, i.e. quantity is not required, e.g. \$/MWh The sum of all Price Components must equal the Product Price.
Set of 1..n Price Components		
Price Component Value	The value of the price component.	Price may have one or more components.
Price Component Type	The portion of the price to which the corresponding value applies	A standard set of price component types should be enumerated, such as: - Wholesale electricity cost - Transmission costs - Distribution costs
Price Type	Time characteristic of the price	A standard set of price types will need to be defined (real time, 5 minute, day ahead, etc.)
Product Price Factor	Terms of use attribute of Product Price	Examples: Price_absolute, Price_relative, Price_multiplier
Override Unit of Measure for the Product	Alternative unit of measure applicable to a given transaction.	If this is used, then Unit of Measure is not applicable



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Attribute	Description	Considerations
Currency	Economic unit of exchange in which the total price and price components are stated (i.e. dollars, euros)	Currency is required to determine the units of measure of the Total Price and Price Components. The energy units of measure are defined by the Product Type.

REQ.15.3.3 Product and Pricing Use Cases

REQ.15.3.3.1 USE CASE OVERVIEW

The use case modeling technique is used for capturing business and data elements relative to electric product and price information. The relationships used in the use case diagrams are as follows:

- Generalization (line with triangle head): this indicates variations (sub-types) of the main use case.
- Precedes: this indicates a time sequence
- Invokes: this indicates a pre-condition or dependency

The use cases included in these Model Business Practices are not intended to be required or exhaustive and are provided for informational purposes.



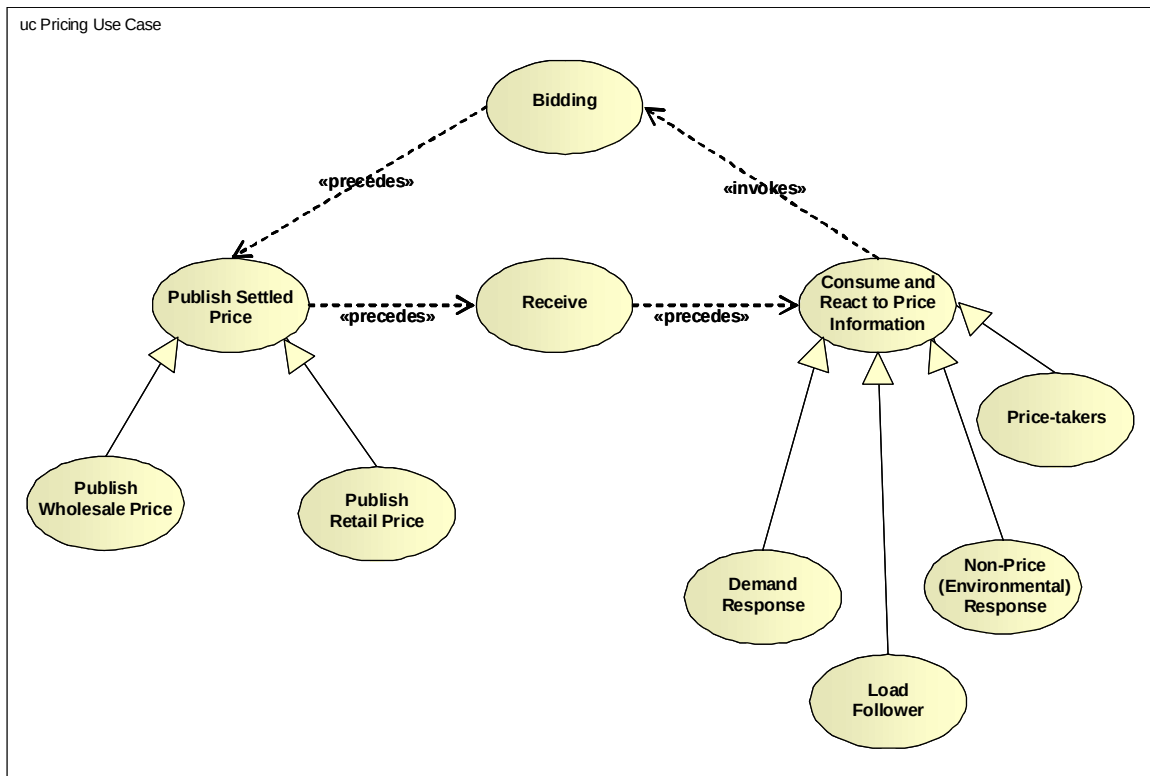
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REQ.15.3.3.2 PRICING USE CASE

The Pricing Use Case below provides an overview of the specific use cases described in these Model Business Practices. The results of bidding produce the settled price which is published and then received. The recipient reacts to the price, which affects the next bidding cycle. The following use cases where electricity pricing and product information can be used are described in these Model Business Practices:

- Demand response
- Non-Price (Environmental) Response
- Load-follower
- Price-takers





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REQ.15.3.3.3 SPECIFIC USE CASES

Specific use cases for what end use consumers of electricity might do when pricing signals are received are listed as follows:

Use Case	Actors	Description	SAMPLE Scenarios
Demand Response	SP ED Control Premise	Utility Customer (or device acting under UC direction) responds to Total Price or Price Component.	The System Operator published day-ahead prices which are statistically higher than average between 2:30 and 5:30 in the afternoon. Illustrate how different End Devices could respond to a forward energy price signal including: - An EMS requests BAS to “pre-cool” until 2:30 PM. - Home-based intelligent device is programmed to operate at a time when electricity is cheaper. An electric plug-in vehicle is programmed to charge when electricity is cheaper. A utility distribution company’s fixed time-of-day tariffs indicates higher price during day, and lower price after 11:00 PM. Demonstrate how different End Devices could respond to price differentials: - Time-insensitive building systems schedule their run-time programs after 11:00 PM. Homeowner starts appliance at 5:10. The appliance notifies that by waiting 20 minutes to run, the consumer will get lower cost electricity. Homeowner acknowledges.
Non-Price (Environmental)	Resource ED	Product characteristics	Utility Customer sets a price threshold at which “green” power is



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Use Case	Actors	Description	SAMPLE Scenarios
Response	Premise	(other than price) are used to influence either the quantity or the time at which the customer uses electricity.	desirable. Above the “green price” the customer will take any power, below the “green price” the customer will choose suppliers with renewable portfolios. Test the scenario where, at 5:00 PM wind power picks up such that the price of power from renewable sources falls below the “green price” set by the customer. Utility delivers blend of 20% wind, 80% coal during this time of day at .10/kWh. 25% of customers indicate preference to buy pure wind, an over-subscription. Prices for pure wind are bid up to .15/kWh as the wind-sensitive market decreases. 20% of consumers pay the 50% premium to get only wind-only power. 1) Local PUC could require that segmentation be revenue-neutral, so bidding for wind power reduces undifferentiated power to .0875 kWh. 2) No bidding was required for undifferentiated power, so provider is incentivized to find additional sources of wind power. 3) Consumers unable to buy desired wind power reduce their aggregate demand. Consumers have programmed non-time-sensitive systems and appliances to not run when wind power is not available, time-shifting some demand until wind power is available at the desired price.



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Use Case	Actors	Description	SAMPLE Scenarios
Load-follower	DER UC		A UC is also a DER. The UC would purchase power up to the price at which the DER can economically produce power. The use case should prove that such a resource can receive enough information from the pricing signals to change its output according to the resource owner's price curve.
Price-taker	DER		A DER with no storage capability and zero fuel cost, such as a wind farm or solar array, will produce power at whatever the "market rate" for generation is at the time of production. The use case should prove that such a resource can identify its cost curve (zero in this case), supply energy to the grid, and get paid at the appropriate rate.



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REQ.15.A Appendix A – Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall information model for demand response. Figure 1A contains a data model used to illustrate the entity-relationships within the model.

Proper (and Improper) Usage of the Entity-Relationship Model. The entity-relationship model is used to show cardinality among objects in the model, for example every Resource belongs to one and only one Service Provider and a Service Location contains one or more Service Delivery Points. The entity-relationship model does not provide use case information; actors are objects in the model and do not “act” in the model. The entity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the enrollment of those Resources may be managed by a System Operator or a Utility Distribution Operator. Both use cases and process maps are separate components of the Model Business Practices.

Reading Crow’s Foot Notation. Objects in the model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow’s Foot notation, as documented in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a Service Location is related to one-or-more Service Delivery Points (reading top to bottom) and every Service Delivery Points is related to exactly-one Service Location (reading bottom to top).

Optional Entities, Roles and Objects. The entity-relationship model is designed to support multiple business models and not every business model will require all entities, roles and/or objects to function. Therefore, entities, roles and objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.

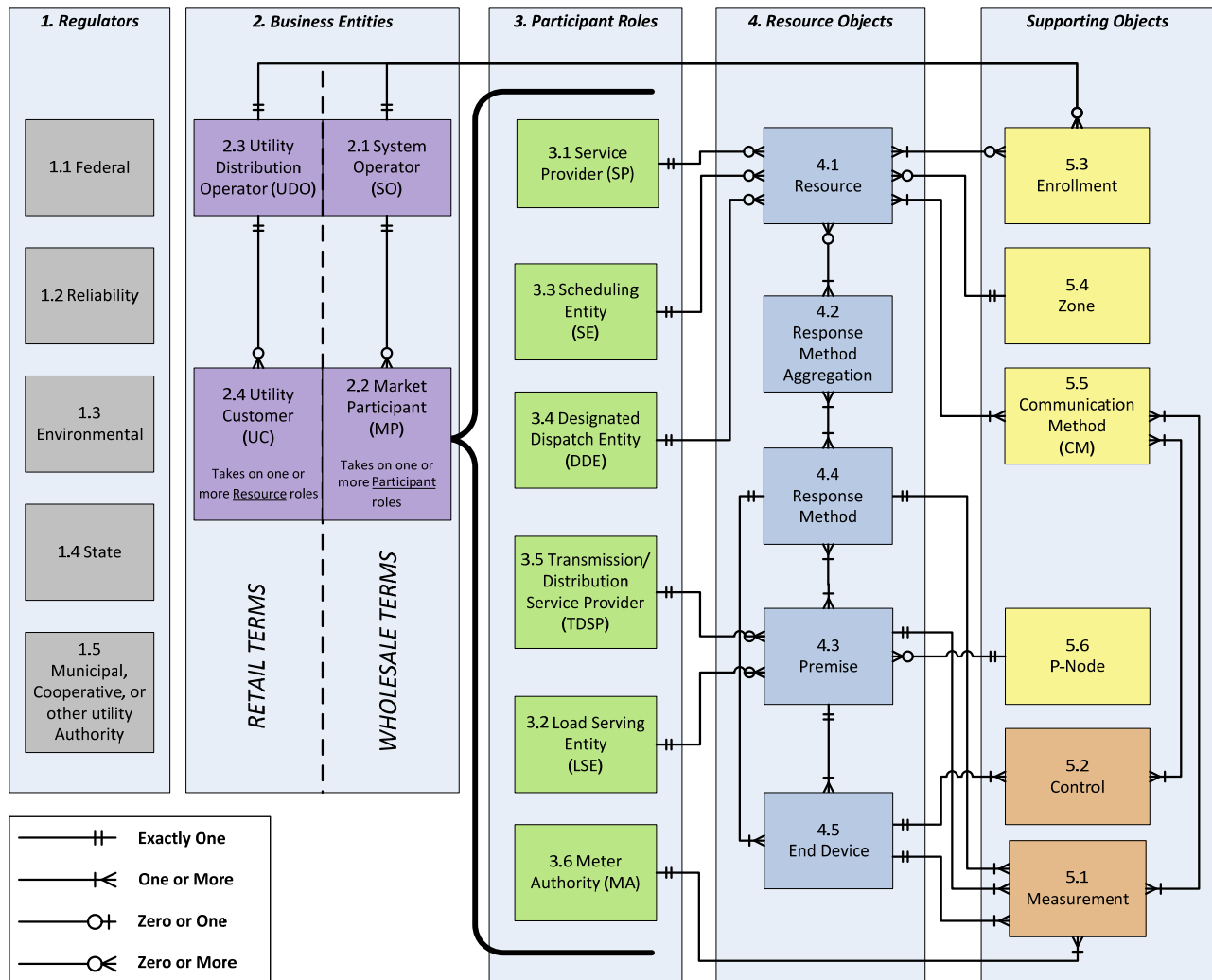
Applicability to Retail and Wholesale. The entity-relationship model is applicable to both wholesale and retail. When using the model for wholesale, the typical applicable business entities are 2.1 (System Operator) and 2.3 (Market Participant), while in retail markets, the parallel business entities are 2.3 (Utility Distribution Operator) and 2.4 (Utility Customers). Other than the swapping of the two pairs of terms, the models are identical, including the names of and relationships among objects.



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Figure 1A. Sample Entity-Relationship Model for Smart Grid Use Cases





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4. Supporting Documentation

a. Description of Request:

REQ Annual Plan Item 9(a) – “Develop Requirements and Use Cases for PAP 03 – Pricing Model”

b. Description of Recommendation:

This recommendation provides the data elements related to the use cases developed as part of the phase one effort

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the development of common specification for electric price and production definition.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes – To be posted
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc
- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc
- September 9, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes – To be posted



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two Requirements Specifications for
Common Scheduling-Schedule Communication
Mechanism for Energy Transactions – for NIST
PAP04

1. RECOMMENDED ACTION:

☐ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☒ Initiation
☐ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☐ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☐ Principle
☐ Definition
☐ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The Smart Grid Standards Subcommittee has determined that additional data requirements related to Priority Action Plan 04 do not need to be developed, as the standards developed as part of the Phase One effort satisfy the request of NIST and provide the necessary basis for other standards organizations developing standards at the request of NIST.

However, the Wholesale Electric Quadrant (WEQ) Executive Committee on July 7, 2010, did "direct the Smart Grid Standards Subcommittee to review the Executive Summary and Introduction to reconsider language that may not be appropriate for business practices long-term in their Phase 2 work."



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two Requirements Specifications for Common Scheduling-Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

Additionally the Board on June 24, 2010 passed a resolution whereby they determined “that the Smart Grid standards developed by the wholesale and retail electric executive committees should strive to be consistent in all areas excepting where there are substantive jurisdictional differences.”

Based on the direction provided, the Smart Grid Standards Subcommittee is submitting the following changes to the Executive Summary and Introductions section for REQ-016.

Note: Conforming changes are also being recommended for the WEQ 2010 Annual Plan Item 6(b)(ii) recommendation “Phase Two - Requirements Specifications for Common Scheduling-Schedule Communication Mechanism for Energy Transactions – for NIST PAP04.”

REQ.16.2.B

New REQ.17.2.B Defined Terms to be added to REQ.17 are included in the Recommendation Request Titled Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03 to avoid redundancy between recommendations.

RECOMMENDED STANDARDS:

Model Business Practices REQ.16 – Specifications for Common Scheduling-Schedule Communication Mechanism for Energy Transactions

Executive Summary

~~Specifications for Common Scheduling Mechanism for Energy Transactions~~

The following contains a set of requirements relating to the use of date and time based data elements that are used in transactions for Demand Response programs. ~~This information is being provided to NIST in order to aid in the development of a standard representation for date/time based data elements derived from an XML representation of iCalendar[±].~~

~~Although there are many other areas where date/time based data elements are used in energy industry transactions this recommendation is~~ These model business practices are limited in scope to only those date/time based data elements that are utilized in Demand Response programs.

[±] <http://tools.ietf.org/html/rfc5545>



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common ~~Scheduling~~ <u>Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two Requirements Specifications for
Common Scheduling-Schedule Communication
Mechanism for Energy Transactions – for NIST
PAP04

Introduction

~~Specifications for Common Scheduling Mechanism for Energy Transactions~~

~~Smart grid interfaces must communicate between domains, that is between different business and consumer entities with different values and approaches (ontologies). Such interfaces must be simplified to bare essentials, and be understandable by parties with different backgrounds and expectations.~~

~~To achieve cross-domain understandability, and thereby enhance interoperation, smart grid transactions must use semantic models from different areas developed by different standards groups. Each of these vocabularies is most fully defined in one area. We have agreed, within the NIST process, to use the vocabularies from the appropriate domain experts to compose the message that flow between domains on the smart grid.~~

~~In the following, we defined transactions as grid events that occur between domains, or whose effects and outcomes must be communicated between domains. This activity makes no assertions about any other events.~~

Smart grid transactions communicate three classes of information. They communicate information about events that occur during power management and distribution. They invoke financial or business transactions that guide those events. They communicate schedules and interval information for the flows of energy. ~~Per agreement, all semantics relating to Power Management will use the CIM from IEC TC57. All financial and market semantics will be based upon the definitions found in ISO 20022² and in their most common expression, FIX. All elements relating to schedule and interval will be expressed in the notation of the IETF iCalendar (RFC 5545³) standard, as defined in the XML representation iCalendar developed by CalConnect. The purpose of this approach is to increase interoperation and understanding between domains.~~

~~The group primarily associated with the development of interoperable enterprise date, time, and interval standards for the IETF is the CalConnect. CalConnect and the Organization for the Advancement of Structured Information Standards will work together to define the common communication of date time and interval to meet the needs of smart grid transaction communications as well as for building systems integration, enterprise interaction, and financial transactions. This commonality is anticipated to reduce barriers to interoperation and thereby to expand participation in DR and DER.~~

The purpose of ~~this action~~ these model business practices is to define the requirements for standard communication of date, time, schedule, and interval by smart grid actors, with particular attention to DR.

² ~~International Organization for Standardization ISO 20022 Universal financial industry message scheme~~

³ ~~Internet Calendaring and Scheduling Core Object Specification (iCalendar)~~



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common <u>Scheduling-Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04

~~These requirements will be submitted to the Organization for the Advancement of Structured Information Standards and CalConnect technical committee to define the applicable communication standards to support them.~~

~~The use cases included in these model business practices are not to be required or exhaustive and are provided for clarification purposes.~~

Scope: The scope of the following is to define the range of information required to establish the breadth of the communication requirement. There is no need for the cases to be exhaustive, merely illustrative of the full scope.

Model Business Practices

REQ.16.1 Specification for Common Scheduling-Schedule Communication Mechanism for Energy Transactions

REQ.16.1.1 ACTORS LIST

There were no actors provided for the associated use cases.

REQ.16.2 Common Scheduling-Schedule Communication Mechanism for Energy Transactions Use Cases

REQ.16.2.1 USE CASE OVERVIEW

The use case modeling technique is used for capturing business and data requirements relative to electric product and price information.

The use cases included in these Model Business Practices are not intended to be required or exhaustive and are provided for clarification purposes.

REQ.16.2.1.1 Requirements for Date and Time Usage

Demand Response programs employ a combination of absolute dates/times, absolute periods (range) of dates/times, relative dates/times, recurring dates/times, absolute intervals and absolute durations in order to communicate temporal information pertaining to demand response transactions. Demand Response programs must also accommodate time zone variations, leap years, leap seconds, and the use of daylight savings time. Any calendaring/Scheduling-schedule communication Model Business Practice that is applicable



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
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to Demand Response programs must be capable of supporting this range of requirements.

An incomplete, but representative, set of instances is provided below. The sample data included are non-normative representations; they are included to clarify the expectation of information that will be in the Model Business Practice.

Type of Representation	Representative Instance	Sample Data
Absolute date/time	Effective start date	2009-11-01
	Effective start date and time	2009-11-01T01:00:00-Z
Absolute Periods (range)	Deployment Period	2009-11-01T01:00:00-Z/ 2009-11-02T24:00:00-Z
Relative date/time (time-point)	Reduction Deadline	30 minutes from a specified point in time
Recurring date/time	Market Closing	Every day at 12:00 noon
Absolute Interval	Meter Data Recording Interval	Every 5 minutes
	System Frequency	60 cycles per second
Absolute Duration	Outage Duration	2 days
	Minimum Run Time	4 hours

It is an additional requirement that all schedule and interval communications be able to express the precision required in the response. For example, an actor may be required to perform within five minutes, or within five milliseconds of the agreed upon time.



For Quadrant: Requesters: Request No.: Request Title:	Retail Electric Quadrant (REQ) Smart Grid Interoperability Panel 2010 Retail Annual Plan Item 9(b)(ii) Phase Two Requirements Specifications for Common <u>Scheduling-Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04

REQ.16.A Appendix A – Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall information model for demand response. Figure 1A contains a data model used to illustrate the entity-relationships within the model.

Proper (and Improper) Usage of the Entity-Relationship Model. The entity-relationship model is used to show cardinality among objects in the model, for example every Resource belongs to one and only one Service Provider and a PremiseService Location contains one or more End-DevicesService Delivery Points. The entity-relationship model does not provide use case information; actors are objects in the model and do not “act” in the model. The entity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the enrollment of those Resources may be managed by a System Operators or a Utility Distribution Operator. Both use cases and process maps are separate components of the Model Business Practices.

Reading Crow’s Foot Notation. Objects in the model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow’s Foot notation, as documents in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a PremiseService Location is related to one-or-more End-DevicesService Delivery Points s (reading top to bottom) and every End-DevicesService Delivery Point is related to exactly-one PremiseService Location (reading bottom to top).

~~**Optional Objects.** The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Premises, but does not require Response Method Aggregations and Response Methods. In this example, the relationship between Resource and Premise is transitive: a Resource is comprised of one-or-more Premises and each Premise is associated with zero-or-more Resources.~~

Optional Objects. The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
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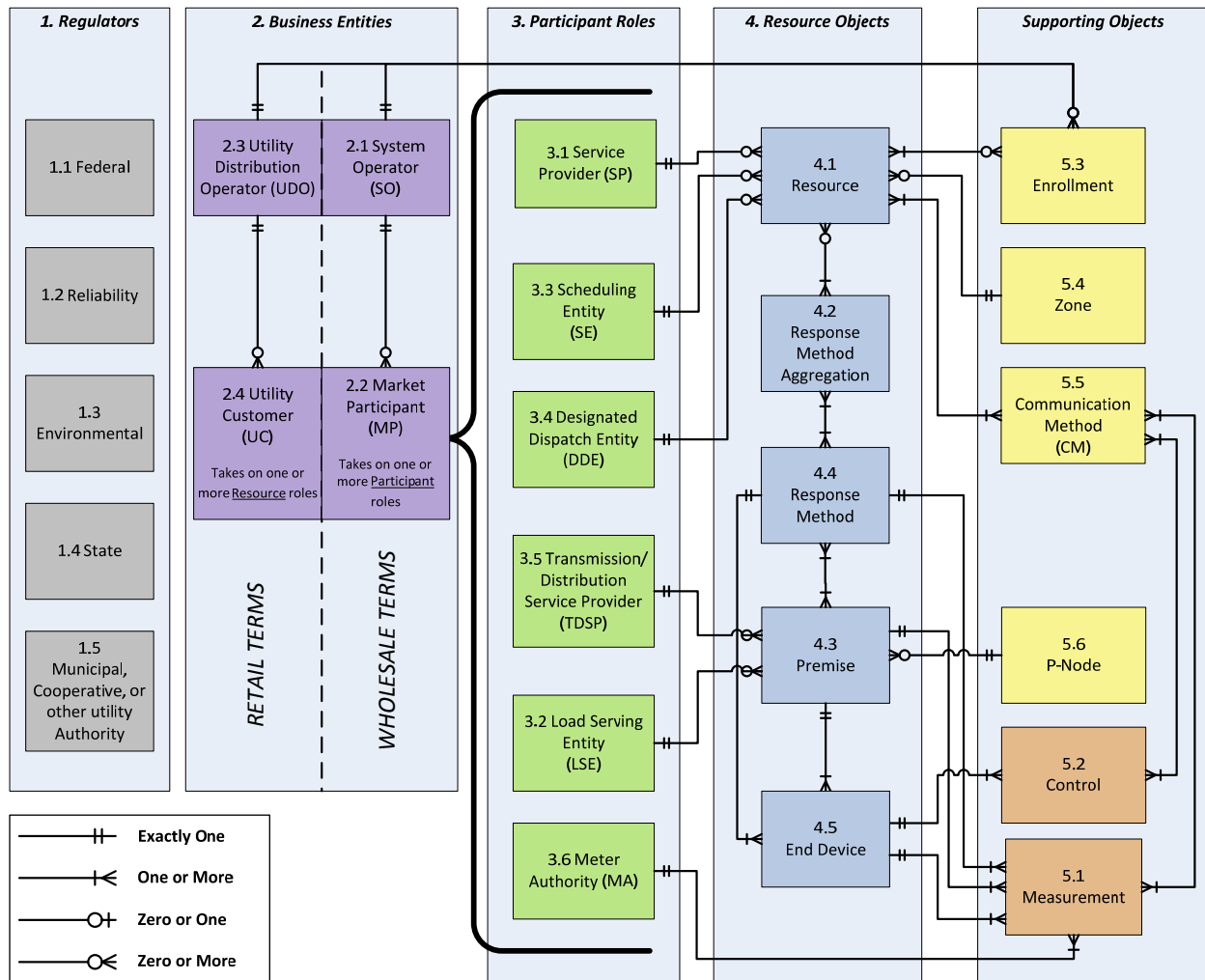
Applicability to Retail and Wholesale. The entity-relationship model is applicable to both wholesale and retail. When using the model for wholesale, the applicable business entities are 2.1 (System Operator) and 2.3 (Market Participant), while in retail markets, the parallel business entities are 2.3 (Utility Distribution Operator) and 2.4 (Utility Customers). Other than the swapping of the two pairs of terms, the models are identical, including the names of and relationships among objects.



For Quadrant:
Requesters:
Request No.:
Request Title:

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Figure 1A. Entity-Relationship Model for Smart Grid Use Cases





For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common <u>Scheduling-Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04

4. SUPPORTING DOCUMENTATION

a. Description of Request:

Retail Annual Plan Item 9(b)(ii) – “Develop Requirements and Use Cases for PAP 04 – Scheduling-Schedule Communication Model - Phase 2”

b. Description of Recommendation:

The Smart Grid Standards Subcommittee is recommending that changes be made to the Executive Summary and Introduction of the model business practices.

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the use of dates/times within a broad spectrum of energy transactions. The scope of this effort has been limited to Demand Response Programs in order to meet NIST’s deadline for this effort. No further action is required to satisfy the request of NIST.

Additionally, the recommendation addresses the direction provided by the WEQ Executive Committee on July 7, 2010, and the resolution passed by the Board of Directions on June 24, 2010.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd072210notes.doc
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc
- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
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Request Title:	Phase Two Requirements Specifications for Common ~~Scheduling~~ <u>Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04

- September 9, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd092310notes.doc
- October 7, 2010 Meeting Notes – To be posted
- October 14, 2010 Meeting Notes – To be posted

Additional links

- WEQ Executive Committee Motions July 7, 2010
http://www.naesb.org/pdf4/weq_ec070710motions.doc
- Board of Directors Resolution June 24, 2010
<http://www.naesb.org/pdf4/bd062410a4.doc>

BGE Comments



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two Requirements Specifications for Common ~~Scheduling~~ Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

1. RECOMMENDED ACTION:

☐ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☒ Initiation
☐ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☐ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☐ Principle
☐ Definition
☐ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The Smart Grid Standards Subcommittee has determined that additional data requirements related to Priority Action Plan 04 do not need to be developed, as the standards-Model Business Practices developed as part of the Phase One effort satisfy the request of NIST and provide the necessary basis for other standards organizations developing standards at the request of NIST.

However, the Wholesale Electric Quadrant (WEQ) Executive Committee on July 7, 2010, did "direct the Smart Grid Standards Subcommittee to review the Executive Summary and Introduction to reconsider language that may not be appropriate for business practices long-term in their Phase 2 work."

BGE Comments



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common ~~Scheduling~~ <u>Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04

Additionally the Board on June 24, 2010 passed a resolution whereby they determined “that the Smart Grid standards developed by the wholesale and retail electric executive committees should strive to be consistent in all areas excepting where there are substantive jurisdictional differences.”

Based on the direction provided, the Smart Grid Standards Subcommittee is submitting the following changes to the Executive Summary and Introductions section for ~~REQ-016~~ REQ.16.

Note: Conforming changes are also being recommended for the WEQ 2010 Annual Plan Item 6(b)(ii) recommendation “Phase Two - Requirements Specifications for Common ~~Scheduling~~ Schedule Communication Mechanism for Energy Transactions – for NIST PAP04.”

(Moved to appropriate location in the document)

REQ.16.2.B

~~New REQ.17.2.B Defined Terms to be added to REQ.17 are included in the Recommendation Request Titled Phase Two Requirements Specification for Common Electricity Product and Pricing Definition for NIST PAP03 to avoid redundancy between recommendations.~~

RECOMMENDED STANDARDS:

Model Business Practices REQ.16 – Specifications for Common ~~Scheduling~~ Schedule Communication Mechanism for Energy Transactions

Executive Summary

~~Specifications for Common Scheduling Mechanism for Energy Transactions~~

The following document contains a set of requirements relating to the use of date and time based data elements that are used in transactions for Demand Response programs. ~~This information is being provided to NIST in order to aid in the development of a standard~~

BGE Comments



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
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~~representation for date/time based data elements derived from an XML representation of iCalendar[±].~~

~~Although there are many other areas where date/time based data elements are used in energy industry transactions this recommendation is~~ These model business practices are limited in scope to only those date/time based data elements that are utilized in Demand Response programs.

[±] ~~<http://tools.ietf.org/html/rfc5545>~~

BGE Comments



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common <u>Scheduling-Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04

Introduction

Specifications for Common Scheduling Mechanism for Energy Transactions

~~Smart grid interfaces must communicate between domains, that is between different business and consumer entities with different values and approaches (ontologies). Such interfaces must be simplified to bare essentials, and be understandable by parties with different backgrounds and expectations.~~

~~To achieve cross-domain understandability, and thereby enhance interoperation, smart grid transactions must use semantic models from different areas developed by different standards groups. Each of these vocabularies is most fully defined in one area. We have agreed, within the NIST process, to use the vocabularies from the appropriate domain experts to compose the message that flow between domains on the smart grid.~~

~~In the following, we defined transactions as grid events that occur between domains, or whose effects and outcomes must be communicated between domains. This activity makes no assertions about any other events.~~

Smart grid transactions communicate three classes of information. They communicate information about events that occur during power management and distribution. They invoke financial or business transactions that guide those events. They communicate schedules and interval information for the flows of energy. ~~Per agreement, all semantics relating to Power Management will use the CIM from IEC TC57. All financial and market semantics will be based upon the definitions found in ISO 20022² and in their most common expression, FIX. All elements relating to schedule and interval will be expressed in the notation of the IETF iCalendar (RFC 5545³) standard, as defined in the XML representation iCalendar developed by CalConnect. The purpose of this approach is to increase interoperation and understanding between domains.~~

~~The group primarily associated with the development of interoperable enterprise date, time, and interval standards for the IETF is the CalConnect. CalConnect and the Organization for the Advancement of Structured Information Standards will work together to define the common communication of date time and interval to meet the needs of smart grid transaction communications as well as for building systems integration, enterprise interaction, and financial transactions. This commonality is anticipated to reduce barriers to interoperation and thereby to expand participation in DR and DER.~~

The purpose of ~~this action~~ these model business practices is to define the requirements for standard communication of date, time, schedule, and interval by smart grid actors, with particular attention to DR~~Demand Response~~.

² ~~International Organization for Standardization ISO 20022 Universal financial industry message scheme~~

³ ~~Internet Calendaring and Scheduling Core Object Specification (iCalendar)~~

BGE Comments



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common ~~Scheduling~~ <u>Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04

~~These requirements will be submitted to the Organization for the Advancement of Structured Information Standards and CalConnect technical committee to define the applicable communication standards to support them.~~

~~The use cases included in these ~~m~~Model ~~b~~Business ~~p~~Practices are not to be required or exhaustive and are provided for clarification purposes.~~

Scope: The scope of the following Model Business Practices is to define the range of information required to establish the breadth of the communication requirement. There is no need for the cases to be exhaustive, merely illustrative of the full scope.

(Need to add the boiler-plate language)

The North American Energy Standards Board (NAESB) is a voluntary non-profit organization comprised of members from all aspects of the natural gas and electric industries. Within NAESB, the Retail Electric Quadrant (REQ) and the Retail Gas Quadrant (RGQ) focus on issues impacting the retail sale of energy to Retail Customers. REQ / RGQ Model Business Practices are intended to provide guidance to Distribution Companies, and other Market Participants involved in providing energy service to Retail Customers.

These Model Business Practices are voluntary and do not address policy issues that are the subject of state legislation or regulatory decisions. These Model Business Practices have been adopted with the realization that as the industry evolves, additional and amended Model Business Practices may be necessary. Any industry participant seeking additional or amended Model Business Practices (including principles, definitions, data elements, process descriptions, and technical implementation instructions) should submit a request to the NAESB office, detailing the change, so that the appropriate process may take place to amend the Model Business Practice.

BGE Comments



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common ~~Scheduling~~ Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

REQ.16.1 Principles (Reserved)

REQ.16.2 Definitions

REQ.16.2.A Business Definitions (Reserved)

REQ.16.2.B Technical Definitions

New REQ.16.2.B Defined Terms to be added to REQ.16 are included in the Recommendation Request Titled Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03 (REQ.15) to avoid redundancy between Model Business Practices.

BGE Comments



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two Requirements Specifications for Common ~~Scheduling~~ Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

REQ.16.3 Model Business Practices

(Standard numbering has REQ.16.1 as Principles, and REQ.2 as Definitions. Model Business Practices are REQ.3)

REQ.16.~~13~~.3.1 Specification for Common ~~Scheduling~~ Schedule Communication Mechanism for Energy Transactions

REQ.16.~~13~~.1.3.1.1 ACTORS LIST

There were no actors provided for the associated use cases.

REQ.16.3.2 Common ~~Scheduling~~ Schedule Communication Mechanism for Energy Transactions Use Cases

REQ.16.3.2.1 USE CASE OVERVIEW

The use case modeling technique is used for capturing business and data requirements relative to electric product and price information.

The use cases included in these Model Business Practices are not intended to be required or exhaustive and are provided for clarification purposes.

REQ.16.3.2.1.1 Requirements for Date and Time Usage

Demand Response programs employ a combination of absolute dates/times, absolute periods (range) of dates/times, relative dates/times, recurring dates/times, absolute intervals and absolute durations in order to communicate temporal information pertaining to ~~d~~Demand ~~r~~Response transactions. Demand Response programs must also accommodate time zone variations, leap years, leap seconds, and the use of daylight savings time. Any calendaring/ ~~Scheduling~~ schedule communication Model Business Practice that is applicable to Demand Response programs must be capable of supporting this range of requirements.

BGE Comments



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
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An incomplete, but representative, set of instances is provided below. The sample data included are non-normative representations; they are included to clarify the expectation of information that will be in the Model Business Practice.

Type of Representation	Representative Instance	Sample Data
Absolute date/time	Effective start date	2009-11-01
	Effective start date and time	2009-11-01T01:00:00-Z
Absolute Periods (range)	Deployment Period	2009-11-01T01:00:00-Z/ 2009-11-02T24:00:00-Z
Relative date/time (time-point)	Reduction Deadline	30 minutes from a specified point in time
Recurring date/time	Market Closing	Every day at 12:00 noon
Absolute Interval	Meter Data Recording Interval	Every 5 minutes
	System Frequency	60 cycles per second
Absolute Duration	Outage Duration	2 days
	Minimum Run Time	4 hours

It is an additional requirement that all schedule and interval communications be able to express the precision required in the response. For example, an actor may be required to perform within five minutes, or within five milliseconds of the agreed upon time.

BGE Comments



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
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(Why is this repeated from REQ.15??? Why not reference it like definitions? This would avoid future maintenance issues with having to update the Appendix in multiple documents. If retained, then need to make the same changes as in REQ.15; i.e. why an Appendix? Why not additional Model Business Practices? Numbering suggestions are if made Model Business Practices. Note that numbering is different than REQ.15. It can be made to conform, but would be confusing.)

REQ.16.A3.3 Appendix A—Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall energy usage information model for ~~d~~Demand ~~r~~Response. Figure 1A contains a data model used to illustrate the eEntity-relationships within the model.

REQ.16.3.3.1 **Proper (and Improper) Usage of the Entity-Relationship Model.** The eEntity-relationship model is used to show cardinality among objects in the model (What model??), for example every Resource (Not defined) belongs to one and only one Service Provider and a PremiseService Location contains one or more End-DevicesService Delivery Points. The eEntity-relationship model does not provide use case information; actors are objects in the Entity-relationship model and do not “act” in the model. The eEntity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the enrollment of those Resources may be managed by a System Operators or a Utility-Distribution Company Operator. Both use cases and process maps are separate components of the Model Business Practices.

REQ.16.3.3.2 **Reading Crow’s Foot Notation.** Objects in the Entity-relationship model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow’s Foot notation, as documenteds in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a PremiseService Location is related to one-or-more End-DevicesService Delivery Points s (reading top to bottom) and

BGE Comments



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
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every ~~End Devices~~ Service Delivery Point is related to exactly-one Premise Service Location (reading bottom to top).

Optional Objects. ~~The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Premises, but does not require Response Method Aggregations and Response Methods. In this example, the relationship between Resource and Premise is transitive: a Resource is comprised of one or more Premises and each Premise is associated with zero or more Resources.~~

REQ.3.3.3 **Optional Objects.** The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the Entity-relationship model are considered optional. For example, a Utility-Distribution Company Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.

REQ.3.3.4 **Applicability to Retail and Wholesale.** The eEntity-relationship model is applicable to both wWholesale Electric (WEQ) and rRetail Electric Quadrants (REQ). When using the Entity-relationship model for wholesaleWEQ, the applicable business eEntities are 2.1 (System Operator) and 2.3 (Market Participant), while in retail-REQ markets, the parallel business eEntities are 2.3 (Utility-Distribution Company Operator) and 2.4 (Utility-Retail Customers). Other than the swapping of the two pairs of terms, the Entity-relationship models are identical, including the names of and relationships among objects.

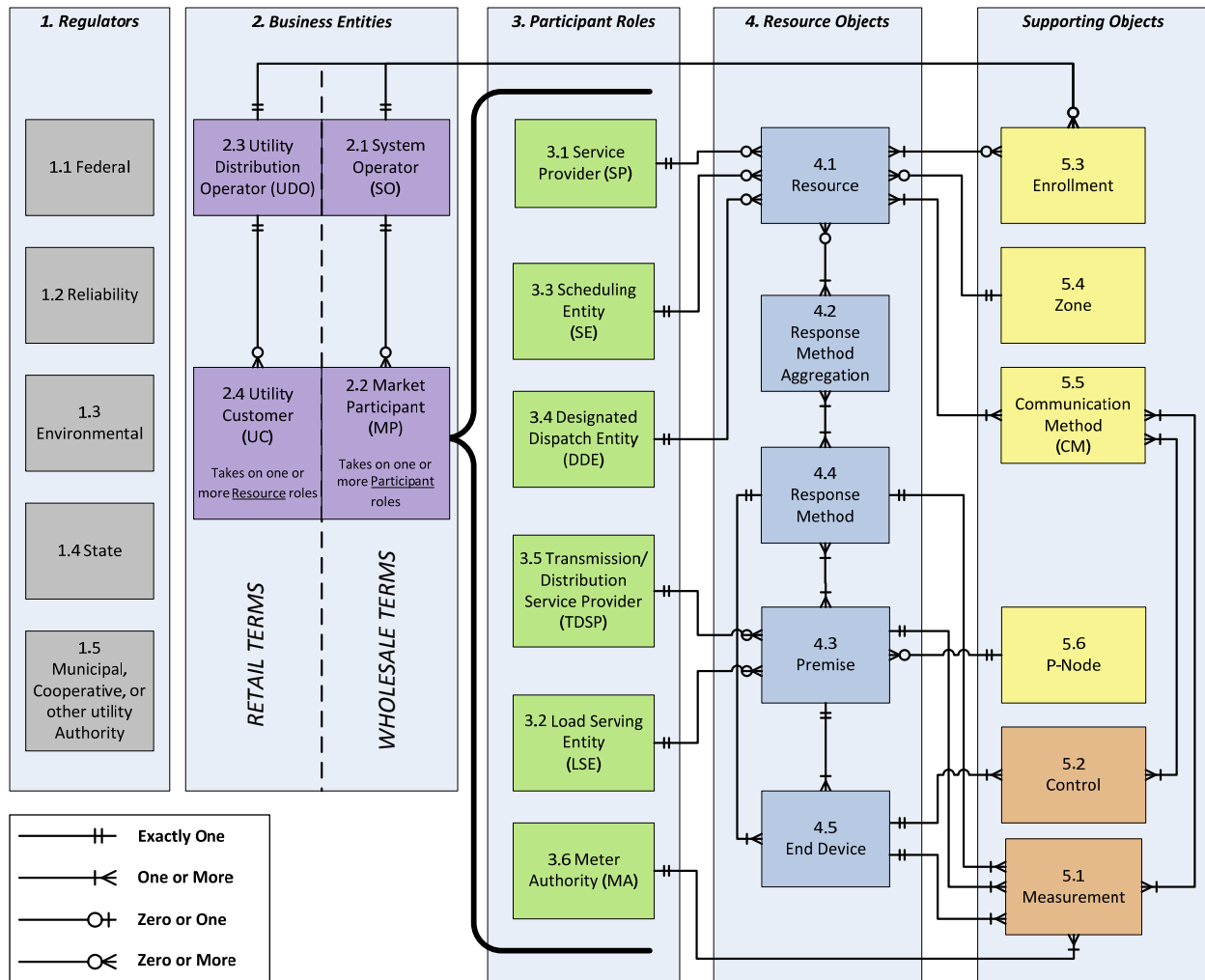
BGE Comments



For Quadrant:
Requesters:
Request No.:
Request Title:

Retail Electric Quadrant (REQ)
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2010 Retail Annual Plan Item 9(b)(ii)
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Common ~~Scheduling~~ Schedule Communication
Mechanism for Energy Transactions – for NIST
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Figure 1A. Entity-Relationship Model for Smart Grid Use Cases



BGE Comments



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common ~~Scheduling~~ <u>Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04

4. SUPPORTING DOCUMENTATION

a. Description of Request:

Retail Annual Plan Item 9(b)(ii) – “Develop Requirements and Use Cases for PAP 04 – ~~Scheduling~~ Schedule Communication Model - Phase 2”

b. Description of Recommendation:

The Smart Grid Standards Subcommittee is recommending that changes be made to the Executive Summary and Introduction of the ~~m~~Model ~~b~~Business ~~p~~Pactices.

c. Business Purpose:

This ~~r~~Recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the use of dates/times within a broad spectrum of energy transactions. The scope of this effort has been limited to Demand Response ~~P~~Programs in order to meet NIST’s deadline for this effort. No further action is required to satisfy the request of NIST.

Additionally, the ~~r~~Recommendation addresses the direction provided by the WEQ Executive Committee on July 7, 2010, and the resolution passed by the Board of Directions on June 24, 2010.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
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BGE Comments



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- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd092310notes.doc
- October 7, 2010 Meeting Notes – To be posted
- October 14, 2010 Meeting Notes – To be posted

Additional links

- WEQ Executive Committee Motions July 7, 2010
http://www.naesb.org/pdf4/weq_ec070710motions.doc
- Board of Directors Resolution June 24, 2010
<http://www.naesb.org/pdf4/bd062410a4.doc>

C#	Company	Category	Cite
1	Trane - Ingersoll Rand (Sharon Dinges)	Editorial	REQ.16.A

Suggested Change

"End Device" / "End Devices" are used, throughout. This was removed as a defined term therefore, suggest considering removal of the capitalization and change it to "end device" / "end devices".



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two ~~Requirements~~ Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

1. RECOMMENDED ACTION:

☐ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☒ Initiation
☐ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☐ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☐ Principle
☐ Definition
☐ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The Smart Grid Standards Subcommittee has determined that additional data ~~requirements~~ elements related to Priority Action Plan 04 do not need to be developed, as the standards developed as part of the Phase One effort satisfy the request of NIST and provide the necessary basis for other standards organizations developing standards at the request of NIST.

However, the Wholesale Electric Quadrant (WEQ) Executive Committee on July 7, 2010, did "direct the Smart Grid Standards Subcommittee to review the Executive Summary and Introduction to reconsider language that may not be appropriate for business practices long-term in their Phase 2 work."



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two ~~Requirements~~ Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

Additionally the Board on June 24, 2010 passed a resolution whereby they determined “that the Smart Grid standards developed by the wholesale and retail electric executive committees should strive to be consistent in all areas excepting where there are substantive jurisdictional differences.”

Based on the direction provided, the Smart Grid Standards Subcommittee is submitting the following changes to the Executive Summary and Introductions section for REQ-016.

Note: Conforming changes are also being recommended for the WEQ 2010 Annual Plan Item 6(b)(ii) recommendation “Phase Two - ~~Requirements~~ Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04.”

REQ.16.2.B

New REQ.17.2.B Defined Terms to be added to REQ.17 are included in the Recommendation Request Titled Phase Two ~~Requirements~~ Specifications for Common Electricity Product and Pricing Definition – for NIST PAP03 to avoid redundancy between recommendations.

RECOMMENDED STANDARDS:

Model Business Practices REQ.16 – Specifications for Common Schedule Communication Mechanism for Energy Transactions

Executive Summary

The following contains a set of ~~requirements~~specifications relating to the use of date and time based data elements that are commonly used in transactions for Demand Response programs.

These model business practices are limited in scope to only those date/time based data elements that are utilized in Demand Response programs.



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two ~~Requirements~~ Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

Introduction

Smart grid transactions communicate three classes of information. They communicate information about events that occur during power management and distribution. They invoke financial or business transactions that guide those events. They communicate schedules and interval information for the flows of energy.

The purpose of these model business practices is to define the ~~requirements~~specifications for standard communication of date, time, schedule, and interval by smart grid actors, with particular attention to DR.

The use cases included in these model business practices are not to be required or exhaustive and are provided for ~~clarification~~informational purposes.

These model business practices and mechanisms included herein are not intended to (i) require the use of any of these mechanisms, (ii) require the provision or purchase of any products, programs, rates, markets or services, or (iii) supersede applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this standard.

Scope: The scope of the following is to define the range of information ~~required~~ to establish the breadth of the communication ~~requirements~~specification. There is no need for the cases to be exhaustive, merely illustrative of the full scope.

Model Business Practices

REQ.16.1 Specification for Common Schedule Communication Mechanism for Energy Transactions

REQ.16.1.1 ACTORS LIST

There were no actors provided for the associated use cases.

REQ.16.2 Common Schedule Communication Mechanism for Energy Transactions Use Cases

REQ.16.2.1 USE CASE OVERVIEW

The use case modeling technique is used for capturing business and data requirements relative to electric product and price information.



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two ~~Requirements~~ Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

The use cases included in these Model Business Practices are not intended to be required or exhaustive and are provided for ~~clarification~~ informational purposes.

These model business practices and mechanisms included herein are not intended to (i) require the use of any of these mechanisms, (ii) require the provision or purchase of any products, programs, rates, markets or services, or (iii) supersede applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this standard.

REQ.16.2.1.1 ~~Requirements~~ Specifications for Date and Time Usage

Demand Response programs employ a combination of absolute dates/times, absolute periods (range) of dates/times, relative dates/times, recurring dates/times, absolute intervals and absolute durations in order to communicate temporal information pertaining to demand response transactions. Demand Response programs ~~must~~ should also accommodate time zone variations, leap years, leap seconds, and the use of daylight savings time. Any calendaring/schedule communication Model Business Practice that is applicable to Demand Response programs ~~must~~ should be capable of supporting this range of requirements.

An incomplete, but representative, set of instances is provided below. The sample data included are non-normative representations; they are included for illustrative purpose ~~to clarify the expectation of information that will be in the Model Business Practice.~~

Type of Representation	Representative Instance	Sample Data
Absolute date/time	Effective start date	2009-11-01
	Effective start date and time	2009-11-01T01:00:00-Z
Absolute Periods (range)	Deployment Period	2009-11-01T01:00:00-Z/ 2009-11-02T24:00:00-Z
Relative date/time (time-point)	Reduction Deadline	30 minutes from a specified point in time
Recurring date/time	Market Closing	Every day at 12:00 noon



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two ~~Requirements~~ Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

Type of Representation	Representative Instance	Sample Data
Absolute Interval	Meter Data Recording Interval	Every 5 minutes
	System Frequency	60 cycles per second
Absolute Duration	Outage Duration	2 days
	Minimum Run Time	4 hours

It is an additional requirementspecification that all schedule and interval communications be able to express the precision required in the response. For example, an actor may be required to perform within five minutes, or within five milliseconds of the agreed upon time.



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two ~~Requirements~~ Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

REQ.16.A Appendix A – Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall information model for demand response. Figure 1A contains a data model used to illustrate the entity-relationships within the model.

Proper (and Improper) Usage of the Entity-Relationship Model. The entity-relationship model is used to show cardinality among objects in the model, for example every Resource belongs to one and only one Service Provider and a Service Location contains one or more Service Delivery Points. The entity-relationship model does not provide use case information; actors are objects in the model and do not “act” in the model. The entity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the enrollment of those Resources may be managed by a System Operators or a Utility Distribution Operator. Both use cases and process maps are separate components of the Model Business Practices.

Reading Crow’s Foot Notation. Objects in the model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow’s Foot notation, as documented [eds](#) in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a Service Location is related to one-or-more Service Delivery Points s (reading top to bottom) and every Service Delivery Point is related to exactly-one Service Location (reading bottom to top).

Optional [Entities, Roles and Objects](#). The entity-relationship model is designed to support multiple business models and not every business model will require all [entities, roles and/or](#) objects to function. Therefore, [all-entities, roles and](#) objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.

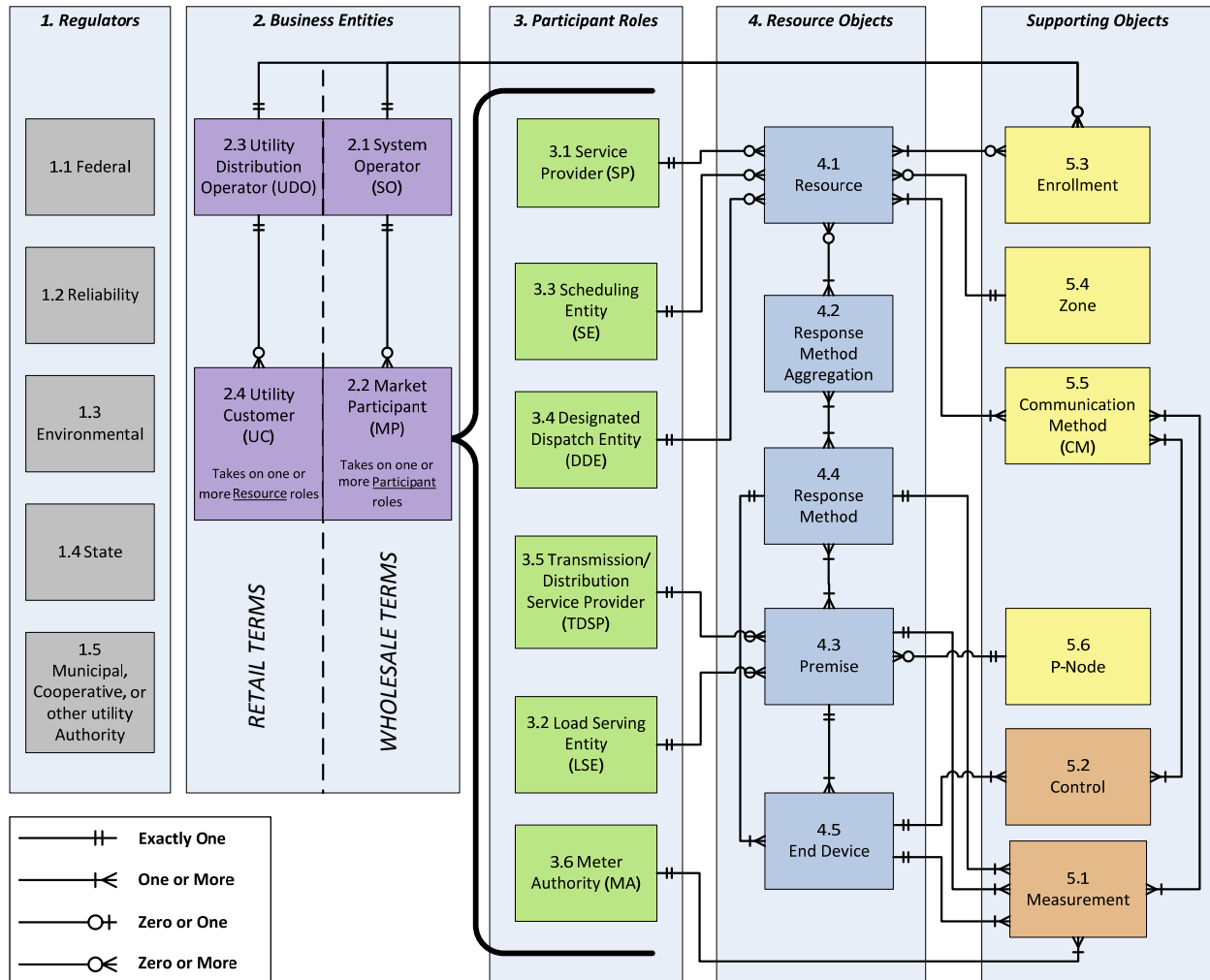
Applicability to Retail and Wholesale. The entity-relationship model is applicable to both wholesale and retail. When using the model for wholesale, the [typical](#) applicable business entities are 2.1 (System Operator) and 2.3 (Market Participant), while in retail markets, the parallel business entities are 2.3 (Utility Distribution Operator) and 2.4 (Utility Customers). Other than the swapping of the two pairs of terms, the models are identical, including the names of and relationships among objects.



For Quadrant:
Requesters:
Request No.:
Request Title:

Retail Electric Quadrant (REQ)
Smart Grid Interoperability Panel
2010 Retail Annual Plan Item 9(b)(ii)
Phase Two **Requirements** Specifications for
Common Schedule Communication Mechanism
for Energy Transactions – for NIST PAP04

Figure 1A. **Sample** Entity-Relationship Model for Smart Grid Use Cases





For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two ~~Requirements~~ Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

4. SUPPORTING DOCUMENTATION

a. Description of Request:

Retail Annual Plan Item 9(b)(ii) – “Develop Requirements and Use Cases for PAP 04 – Schedule Communication Model - Phase 2”

b. Description of Recommendation:

The Smart Grid Standards Subcommittee is recommending that changes be made to the Executive Summary and Introduction of the model business practices.

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the use of dates/times within a broad spectrum of energy transactions. The scope of this effort has been limited to Demand Response Programs in order to meet NIST’s deadline for this effort. No further action is required to satisfy the request of NIST.

Additionally, the recommendation addresses the direction provided by the WEQ Executive Committee on July 7, 2010, and the resolution passed by the Board of Directions on June 24, 2010.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd072210notes.doc
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc
- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc
- September 9, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two ~~Requirements~~ Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd092310notes.doc
- October 7, 2010 Meeting Notes – To be posted
- October 14, 2010 Meeting Notes – To be posted

Additional links

- WEQ Executive Committee Motions July 7, 2010
http://www.naesb.org/pdf4/weq_ec070710motions.doc
- Board of Directors Resolution June 24, 2010
<http://www.naesb.org/pdf4/bd062410a4.doc>



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two Requirements Specifications for Common Scheduling-Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

1. RECOMMENDED ACTION:

☐ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☒ Initiation
☐ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☐ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☐ Principle
☐ Definition
☐ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The Smart Grid Standards Subcommittee has determined that additional data requirements-elements related to Priority Action Plan 04 do not need to be developed, as the standards developed as part of the Phase One effort satisfy the request of NIST and provide the necessary basis for other standards organizations developing standards at the request of NIST.

However, the Wholesale Electric Quadrant (WEQ) Executive Committee on July 7, 2010, did "direct the Smart Grid Standards Subcommittee to review the Executive Summary and Introduction to reconsider language that may not be appropriate for business practices long-term in their Phase 2 work."



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two Requirements Specifications for Common Scheduling-Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

Additionally the Board on June 24, 2010 passed a resolution whereby they determined “that the Smart Grid standards developed by the wholesale and retail electric executive committees should strive to be consistent in all areas excepting where there are substantive jurisdictional differences.”

Based on the direction provided, the Smart Grid Standards Subcommittee is submitting the following changes to the Executive Summary and Introductions section for REQ-016.

Note: Conforming changes are also being recommended for the WEQ 2010 Annual Plan Item 6(b)(ii) recommendation “Phase Two - Requirements Specifications for Common Scheduling-Schedule Communication Mechanism for Energy Transactions – for NIST PAP04.”

REQ.16.2.B

New REQ.17.2.B Defined Terms to be added to REQ.17 are included in the Recommendation Request Titled Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03 to avoid redundancy between recommendations.

RECOMMENDED STANDARDS:

Model Business Practices REQ.16 – Specifications for Common Scheduling-Schedule Communication Mechanism for Energy Transactions

Executive Summary

~~Specifications for Common Scheduling Mechanism for Energy Transactions~~

The following contains a set of requirements-specifications relating to the use of date and time based data elements that are commonly used in transactions for Demand Response programs. ~~This information is being provided to NIST in order to aid in the development of a standard representation for date/time based data elements derived from an XML representation of iCalendar[±].~~

~~Although there are many other areas where date/time based data elements are used in energy industry transactions this recommendation is~~ These model business practices are limited in

[±] <http://tools.ietf.org/html/rfc5545>

Late Comments Submitted by D. Pratt, J. Phillips and B. Bartell



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common ~~Scheduling~~ <u>Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04

scope to only those date/time based data elements that are utilized in Demand Response programs.

The intent is to clearly specify the business information that may be necessary to be exchanged to make effective and reasonable business decisions, standards or implementations that do not directly use such schemas and element names may conform to these requirements through clearly defined mapping documentation. All data element names and implied or stated structures are not intended to specify specific message payloads or information object. The intent is to clearly specify the business information that may be necessary to be exchanged to make effective and reasonable business decisions, and NAESB understands that standards that do not directly use such schemas and element names may conform to these requirements.



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two Requirements Specifications for
Common Scheduling Schedule Communication
Mechanism for Energy Transactions – for NIST
PAP04

Introduction

~~Specifications for Common Scheduling Mechanism for Energy Transactions~~

~~Smart grid interfaces must communicate between domains, that is between different business and consumer entities with different values and approaches (ontologies). Such interfaces must be simplified to bare essentials, and be understandable by parties with different backgrounds and expectations.~~

~~To achieve cross-domain understandability, and thereby enhance interoperation, smart grid transactions must use semantic models from different areas developed by different standards groups. Each of these vocabularies is most fully defined in one area. We have agreed, within the NIST process, to use the vocabularies from the appropriate domain experts to compose the message that flow between domains on the smart grid.~~

~~In the following, we defined transactions as grid events that occur between domains, or whose effects and outcomes must be communicated between domains. This activity makes no assertions about any other events.~~

Smart grid transactions communicate three classes of information. They communicate information about events that occur during power management and distribution. They invoke financial or business transactions that guide those events. They communicate schedules and interval information for the flows of energy. ~~Per agreement, all semantics relating to Power Management will use the CIM from IEC TC57. All financial and market semantics will be based upon the definitions found in ISO 20022² and in their most common expression, FIX. All elements relating to schedule and interval will be expressed in the notation of the IETF iCalendar (RFC 5545³) standard, as defined in the XML representation iCalendar developed by CalConnect. The purpose of this approach is to increase interoperation and understanding between domains.~~

~~The group primarily associated with the development of interoperable enterprise date, time, and interval standards for the IETF is the CalConnect. CalConnect and the Organization for the Advancement of Structured Information Standards will work together to define the common communication of date time and interval to meet the needs of smart grid transaction communications as well as for building systems integration, enterprise interaction, and financial transactions. This commonality is anticipated to reduce barriers to interoperation and thereby to expand participation in DR and DER.~~

The purpose of this action these model business practices is to define the requirements specifications for standard communication of date, time, schedule, and interval by smart grid actors, with particular attention to DR.

² International Organization for Standardization ISO 20022 Universal financial industry message scheme

³ Internet Calendaring and Scheduling Core Object Specification (iCalendar)



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common <u>Scheduling-Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04

~~These requirements will be submitted to the Organization for the Advancement of Structured Information Standards and CalConnect technical committee to define the applicable communication standards to support them.~~

~~The use cases included in these model business practices are not to be required or exhaustive and are provided for clarification-informational purposes.~~

These model business practices and mechanisms included herein are not intended to (i) require the use of any of these mechanisms, (ii) require the provision or purchase of any products, programs, rates, markets or services, or (iii) supersede applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this standard.

Scope: The scope of the following is to define the range of information required to establish the breadth of the communication requirement. There is no need for the cases to be exhaustive, merely illustrative of the full scope.

The North American Energy Standards Board (NAESB) is a voluntary non-profit organization comprised of members from all aspects of the natural gas and electric industries. Within NAESB, the Retail Electric Quadrant (REQ) and the Retail Gas Quadrant (RGQ) focus on issues impacting the retail sale of energy to Retail Customers. REQ / RGQ Model Business Practices are intended to provide guidance to Distribution Companies, and other Market Participants involved in providing energy service to Retail Customers.

These Model Business Practices are voluntary and do not address policy issues that are the subject of state legislation or regulatory decisions. These Model Business Practices have been adopted with the realization that as the industry evolves, additional and amended Model Business Practices may be necessary. Any industry participant seeking additional or amended Model Business Practices (including principles, definitions, data elements, process descriptions, and technical implementation instructions) should submit a request to the NAESB office, detailing the change, so that the appropriate process may take place to amend the Model Business Practice.



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two Requirements Specifications for
Common ~~Scheduling~~ Schedule Communication
Mechanism for Energy Transactions – for NIST
PAP04

REQ.16.1 Principles (Reserved)

REQ.16.2 Definitions

REQ.16.2.A Business Definitions (Reserved)

REQ.16.2.B Technical Definitions

New REQ.16.2.B Defined Terms to be added to REQ.16 are included in the Recommendation Request Titled Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03 (REQ.15) to avoid redundancy between Model Business Practices.

Model Business Practices

| REQ.16.~~13~~.1 Specification for Common ~~Scheduling~~ Schedule Communication Mechanism for Energy Transactions

| REQ.16.~~31~~.1.1 ACTORS LIST

There were no actors provided for the associated use cases.

| REQ.16.3.2 Common ~~Scheduling~~ Schedule Communication Mechanism for Energy Transactions Use Cases

| REQ.16.3.2.1 USE CASE OVERVIEW

The use case modeling technique is used for capturing business and data requirements relative to electric product and price information.

The use cases included in these Model Business Practices are not intended to be required or exhaustive and are provided for ~~clarification~~ informational purposes.



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two Requirements Specifications for
Common Scheduling-Schedule Communication
Mechanism for Energy Transactions – for NIST
PAP04

REQ.16.3.2.1.1 Requirements-Specifications for Date and Time Usage

Demand Response programs employ a combination of absolute dates/times, absolute periods (range) of dates/times, relative dates/times, recurring dates/times, absolute intervals and absolute durations in order to communicate temporal information pertaining to demand response transactions. Demand Response programs mustshould also accommodate time zone variations, leap years, leap seconds, and the use of daylight savings time. Any calendaring/Scheduling-schedule communication Model Business Practice that is applicable to Demand Response programs must-should be capable of supporting this range of requirements.

An incomplete, but representative, set of instances is provided below. The sample data included are non-normative representations; they are included to clarify the expectation of information that will be in the Model Business Practicefor illustrative purposes.

Type of Representation	Representative Instance	Sample Data
Absolute date/time	Effective start date	2009-11-01
	Effective start date and time	2009-11-01T01:00:00-Z
Absolute Periods (range)	Deployment Period	2009-11-01T01:00:00-Z/ 2009-11-02T24:00:00-Z
Relative date/time (time-point)	Reduction Deadline	30 minutes from a specified point in time
Recurring date/time	Market Closing	Every day at 12:00 noon
Absolute Interval	Meter Data Recording Interval	Every 5 minutes
	System Frequency	60 cycles per second
Absolute Duration	Outage Duration	2 days
	Minimum Run Time	4 hours

Late Comments Submitted by D. Pratt, J. Phillips and B. Bartell



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common ~~Scheduling~~ <u>Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04

It is an additional requirement–specification that all schedule and interval communications be able to express the precision required in the response. For example, an actor may be required to perform within five minutes, or within five milliseconds of the agreed upon time.



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two Requirements Specifications for
Common Scheduling-Schedule Communication
Mechanism for Energy Transactions – for NIST
PAP04

REQ.16.A Appendix A – Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall information model for demand response. Figure 1A contains a data model used to illustrate the entity-relationships within the model.

Proper (and Improper) Usage of the Entity-Relationship Model. The entity-relationship model is used to show cardinality among objects in the model, for example every Resource belongs to one and only one Service Provider and a PremiseService Location contains one or more End-DevicesService Delivery Points. The entity-relationship model does not provide use case information; actors are objects in the model and do not “act” in the model. The entity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the enrollment of those Resources may be managed by a System Operator^s or a Utility Distribution Operator. Both use cases and process maps are separate components of the Model Business Practices.

Reading Crow’s Foot Notation. Objects in the model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow’s Foot notation, as documented^{eds} in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a PremiseService Location is related to one-or-more End-DevicesService Delivery Points s (reading top to bottom) and every End-DevicesService Delivery Point is related to exactly-one PremiseService Location (reading bottom to top).

~~**Optional Objects.** The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Premises, but does not require Response Method Aggregations and Response Methods. In this example, the relationship between Resource and Premise is transitive: a Resource is comprised of one-or-more Premises and each Premise is associated with zero-or-more Resources.~~

Optional Entities, Roles and Objects. The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all-entities, roles and objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common ~~Scheduling~~ <u>Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04

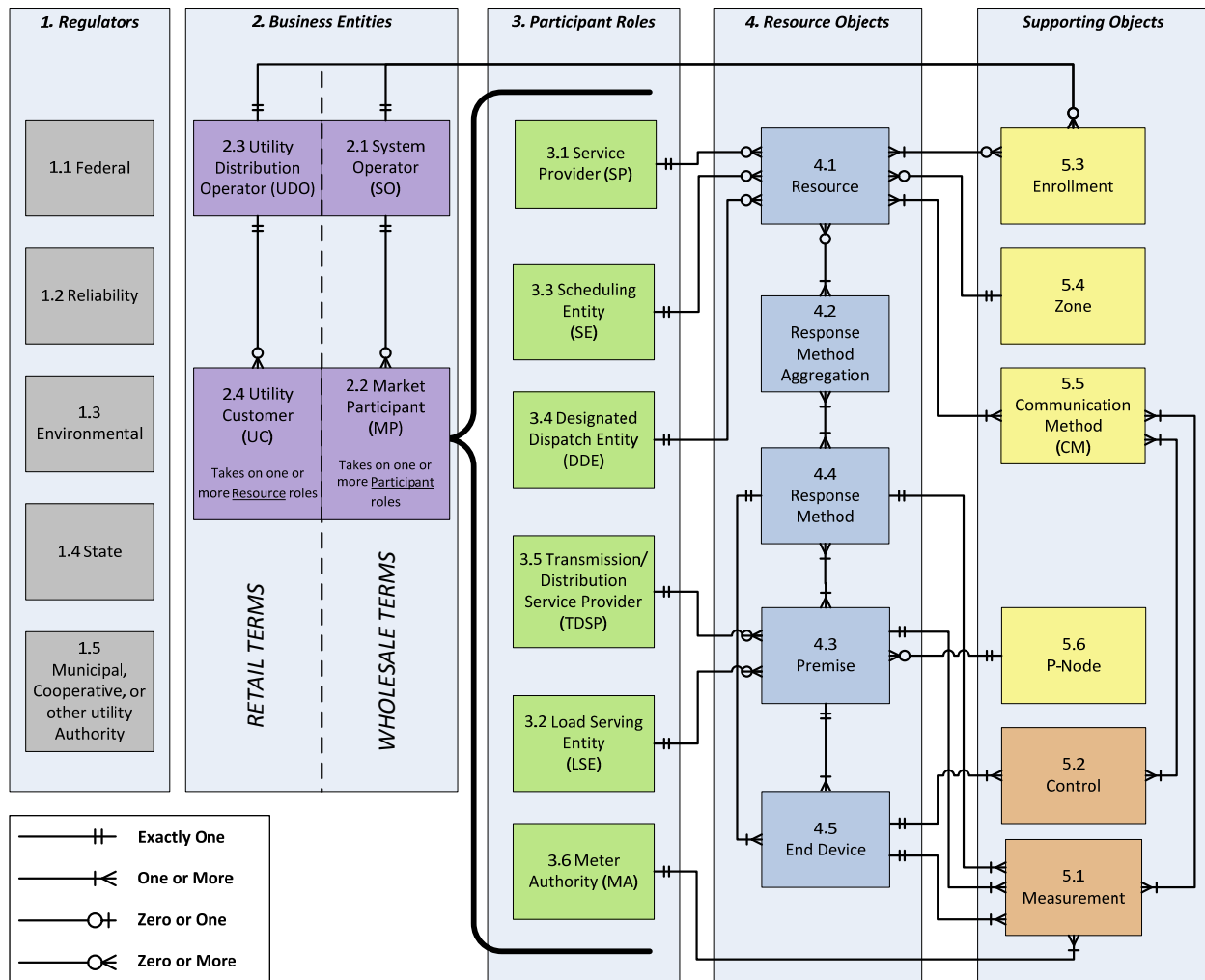
Applicability to Retail and Wholesale. The entity-relationship model is applicable to both wholesale and retail. When using the model for wholesale, the typical applicable business entities are 2.1 (System Operator) and 2.3 (Market Participant), while in retail markets, the parallel business entities are 2.3 (Utility Distribution Operator) and 2.4 (Utility Customers). Other than the swapping of the two pairs of terms, the models are identical, including the names of and relationships among objects.



For Quadrant:
Requesters:
Request No.:
Request Title:

Retail Electric Quadrant (REQ)
Smart Grid Interoperability Panel
2010 Retail Annual Plan Item 9(b)(ii)
Phase Two Requirements Specifications for
Common Scheduling-Schedule Communication
Mechanism for Energy Transactions – for NIST
PAP04

Figure 1A. Sample Entity-Relationship Model for Smart Grid Use Cases





For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common <u>Scheduling-Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04

4. SUPPORTING DOCUMENTATION

a. Description of Request:

Retail Annual Plan Item 9(b)(ii) – “Develop Requirements and Use Cases for PAP 04 – Scheduling-Schedule Communication Model - Phase 2”

b. Description of Recommendation:

The Smart Grid Standards Subcommittee is recommending that changes be made to the Executive Summary and Introduction of the model business practices.

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the use of dates/times within a broad spectrum of energy transactions. The scope of this effort has been limited to Demand Response Programs in order to meet NIST’s deadline for this effort. No further action is required to satisfy the request of NIST.

Additionally, the recommendation addresses the direction provided by the WEQ Executive Committee on July 7, 2010, and the resolution passed by the Board of Directions on June 24, 2010.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd072210notes.doc
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc
- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc

Late Comments Submitted by D. Pratt, J. Phillips and B. Bartell



For Quadrant:	Retail Electric Quadrant (REQ)
Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common ~~Scheduling~~ <u>Schedule Communication</u> Mechanism for Energy Transactions – for NIST PAP04

- September 9, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd092310notes.doc
- October 7, 2010 Meeting Notes – To be posted
- October 14, 2010 Meeting Notes – To be posted

Additional links

- WEQ Executive Committee Motions July 7, 2010
http://www.naesb.org/pdf4/weq_ec070710motions.doc
- Board of Directors Resolution June 24, 2010
<http://www.naesb.org/pdf4/bd062410a4.doc>



For Quadrant: Retail Electric Quadrant (REQ)
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(b)(ii)
Request Title: Phase Two Requirements Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

1. RECOMMENDED ACTION:

☐ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☒ Initiation
☐ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☐ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☐ Principle
☐ Definition
☐ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The Smart Grid Standards Subcommittee has determined that additional data elements related to Priority Action Plan 04 do not need to be developed, as the standards developed as part of the Phase One effort satisfy the request of NIST and provide the necessary basis for other standards organizations developing standards at the request of NIST.

However, the Wholesale Electric Quadrant (WEQ) Executive Committee on July 7, 2010, did "direct the Smart Grid Standards Subcommittee to review the Executive Summary and Introduction to reconsider language that may not be appropriate for business practices long-term in their Phase 2 work."



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Requesters:	Smart Grid Interoperability Panel
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Request Title:	Phase Two Requirements Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

Additionally the Board on June 24, 2010 passed a resolution whereby they determined “that the Smart Grid standards developed by the wholesale and retail electric executive committees should strive to be consistent in all areas excepting where there are substantive jurisdictional differences.”

Based on the direction provided, the Smart Grid Standards Subcommittee is submitting the following changes to the Executive Summary and Introductions section for REQ-016.

Note: Conforming changes are also being recommended for the WEQ 2010 Annual Plan Item 6(b)(ii) recommendation “Phase Two - Requirements Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04.”

RECOMMENDED STANDARDS:

Model Business Practices REQ.16 – Specifications for Common Schedule Communication Mechanism for Energy Transactions

Executive Summary

The following contains a set of specifications relating to the use of date and time based data elements that are commonly used in transactions for Demand Response programs.

These model business practices are limited in scope to only those date/time based data elements that are utilized in Demand Response programs.

The intent is to clearly specify the business information that may be necessary to be exchanged to make effective and reasonable business decisions, standards or implementations that do not directly use such schemas and element names may conform to these requirements through clearly defined mapping documentation.



For Quadrant:	Retail Electric Quadrant (REQ)
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Request Title:	Phase Two Requirements Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

Introduction

Smart grid transactions communicate three classes of information. They communicate information about events that occur during power management and distribution. They invoke financial or business transactions that guide those events. They communicate schedules and interval information for the flows of energy.

The purpose of these model business practices is to define the specifications for standard communication of date, time, schedule, and interval by smart grid actors, with particular attention to DR.

The use cases included in these model business practices are not to be required or exhaustive and are provided for informational purposes.

These model business practices and mechanisms included herein are not intended to (i) require the use of any of these mechanisms, (ii) require the provision or purchase of any products, programs, rates, markets or services, or (iii) supersede applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this standard.

Scope: The scope of the following is to define the range of information required to establish the breadth of the communication requirement. There is no need for the cases to be exhaustive, merely illustrative of the full scope.

The North American Energy Standards Board (NAESB) is a voluntary non-profit organization comprised of members from all aspects of the natural gas and electric industries. Within NAESB, the Retail Electric Quadrant (REQ) and the Retail Gas Quadrant (RGQ) focus on issues impacting the retail sale of energy to Retail Customers. REQ / RGQ Model Business Practices are intended to provide guidance to Distribution Companies, and other Market Participants involved in providing energy service to Retail Customers.

These Model Business Practices are voluntary and do not address policy issues that are the subject of state legislation or regulatory decisions. These Model Business Practices have been adopted with the realization that as the industry evolves, additional and amended Model Business Practices may be necessary. Any industry participant seeking additional or amended Model Business Practices (including principles, definitions, data elements, process descriptions, and technical implementation instructions) should submit a request to the NAESB office, detailing the change, so that the appropriate process may take place to amend the Model Business Practice.



For Quadrant:	Retail Electric Quadrant (REQ)
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Request Title:	Phase Two Requirements Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

REQ.16.1 Principles (Reserved)

REQ.16.2 Definitions

REQ.16.2.A Business Definitions (Reserved)

REQ.16.2.B Technical Definitions

New REQ.16.2.B Defined Terms to be added to REQ.16 are included in the Recommendation Request Titled Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03 (REQ.15) to avoid redundancy between Model Business Practices.

Model Business Practices

REQ.16.3.1 Specification for Common Schedule Communication Mechanism for Energy Transactions

REQ.16.3.1.1 ACTORS LIST

There were no actors provided for the associated use cases.

REQ.16.3.2 Common Schedule Communication Mechanism for Energy Transactions Use Cases

REQ.16.3.2.1 USE CASE OVERVIEW

The use case modeling technique is used for capturing business and data requirements relative to electric product and price information.

The use cases included in these Model Business Practices are not intended to be required or exhaustive and are provided for informational purposes.

[These model business practices and mechanisms included herein are not intended to \(i\) require the use of any of these mechanisms. \(ii\) require the](#)



For Quadrant: Retail Electric Quadrant (REQ)
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provision or purchase of any products, programs, rates, markets or services, or (iii) supersede applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this standard.

REQ.16.3.2.1.1 Specifications for Date and Time Usage

Demand Response programs employ a combination of absolute dates/times, absolute periods (range) of dates/times, relative dates/times, recurring dates/times, absolute intervals and absolute durations in order to communicate temporal information pertaining to demand response transactions. Demand Response programs should also accommodate time zone variations, leap years, leap seconds, and the use of daylight savings time. Any calendaring/schedule communication Model Business Practice that is applicable to Demand Response programs should be capable of supporting this range of requirements.

An incomplete, but representative, set of instances is provided below. The sample data included are non-normative representations; they are included for illustrative purposes.

Type of Representation	Representative Instance	Sample Data
Absolute date/time	Effective start date	2009-11-01
	Effective start date and time	2009-11-01T01:00:00-Z
Absolute Periods (range)	Deployment Period	2009-11-01T01:00:00-Z/ 2009-11-02T24:00:00-Z
Relative date/time (time-point)	Reduction Deadline	30 minutes from a specified point in time
Recurring date/time	Market Closing	Every day at 12:00 noon
Absolute Interval	Meter Data Recording Interval	Every 5 minutes
	System Frequency	60 cycles per second
Absolute Duration	Outage Duration	2 days
	Minimum Run Time	4 hours



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It is an additional specification that all schedule and interval communications be able to express the precision required in the response. For example, an actor may be required to perform within five minutes, or within five milliseconds of the agreed upon time.



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REQ.16.A Appendix A – Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall information model for demand response. Figure 1A contains a data model used to illustrate the entity-relationships within the model.

Proper (and Improper) Usage of the Entity-Relationship Model. The entity-relationship model is used to show cardinality among objects in the model, for example every Resource belongs to one and only one Service Provider and a Service Location contains one or more Service Delivery Points. The entity-relationship model does not provide use case information; actors are objects in the model and do not “act” in the model. The entity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the enrollment of those Resources may be managed by a System Operator or a Utility Distribution Operator. Both use cases and process maps are separate components of the Model Business Practices.

Reading Crow’s Foot Notation. Objects in the model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow’s Foot notation, as documented in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a Service Location is related to one-or-more Service Delivery Points (reading top to bottom) and every Service Delivery Point is related to exactly-one Service Location (reading bottom to top).

Optional Entities, Roles and Objects. The entity-relationship model is designed to support multiple business models and not every business model will require all [entities, roles and/or](#) objects to function. Therefore, entities, roles and objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.

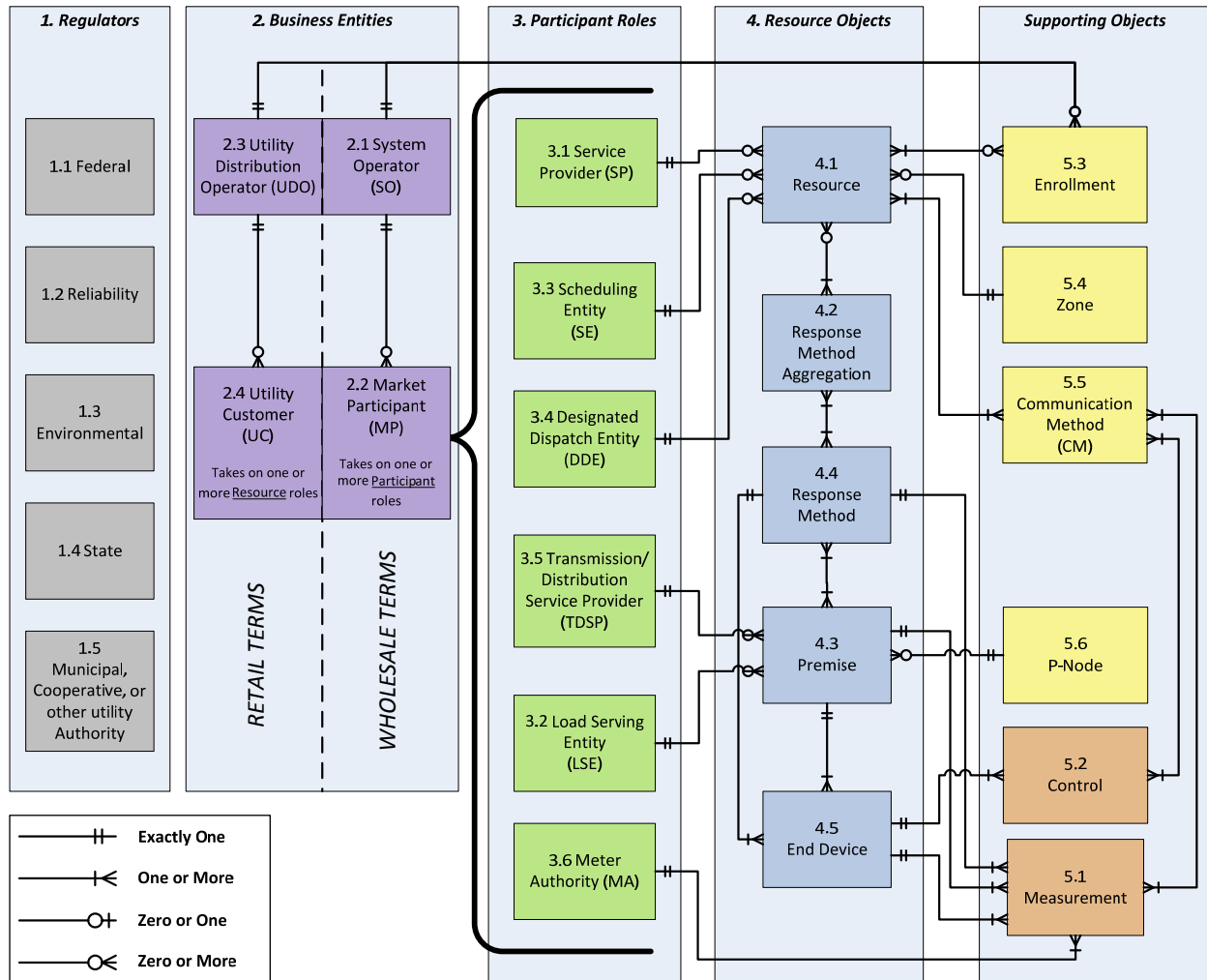
Applicability to Retail and Wholesale. The entity-relationship model is applicable to both wholesale and retail. When using the model for wholesale, the typical applicable business entities are 2.1 (System Operator) and 2.3 (Market Participant), while in retail markets, the parallel business entities are 2.3 (Utility Distribution Operator) and 2.4 (Utility Customers). Other than the swapping of the two pairs of terms, the models are identical, including the names of and relationships among objects.



For Quadrant:
Requesters:
Request No.:
Request Title:

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Smart Grid Interoperability Panel
2010 Retail Annual Plan Item 9(b)(ii)
Phase Two Requirements Specifications for
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for Energy Transactions – for NIST PAP04

Figure 1A. Sample Entity-Relationship Model for Smart Grid Use Cases





For Quadrant:	Retail Electric Quadrant (REQ)
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Request No.:	2010 Retail Annual Plan Item 9(b)(ii)
Request Title:	Phase Two Requirements Specifications for Common Schedule Communication Mechanism for Energy Transactions – for NIST PAP04

4. SUPPORTING DOCUMENTATION

a. Description of Request:

Retail Annual Plan Item 9(b)(ii) – “Develop Requirements and Use Cases for PAP 04 – Schedule Communication Model - Phase 2”

b. Description of Recommendation:

The Smart Grid Standards Subcommittee is recommending that changes be made to the Executive Summary and Introduction of the model business practices.

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the use of dates/times within a broad spectrum of energy transactions. The scope of this effort has been limited to Demand Response Programs in order to meet NIST’s deadline for this effort. No further action is required to satisfy the request of NIST.

Additionally, the recommendation addresses the direction provided by the WEQ Executive Committee on July 7, 2010, and the resolution passed by the Board of Directions on June 24, 2010.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- June 10, 2010 Meeting Notes – To be posted
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- August 12, 2010 Meeting Notes –
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- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc
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- September 16, 2010 Meeting Notes –
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- September 23, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd092310notes.doc
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Additional links

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http://www.naesb.org/pdf4/weq_ec070710motions.doc
- Board of Directors Resolution June 24, 2010
<http://www.naesb.org/pdf4/bd062410a4.doc>



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

1. RECOMMENDED ACTION:

☒ Accept as requested
☐ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☒ Initiation
☐ Modification
☐ Interpretation
☐ Withdrawal

☐ Principle
☐ Definition
☐ Business Practice Standard
☐ Document
☒ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☒ Initiation
☐ Modification
☐ Interpretation
☐ Withdrawal

☐ Principle
☐ Definition
☐ Business Practice Standard
☐ Document
☒ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY: The Master Data Requirements List contains the list of data elements used in the use cases that were developed for PAP 03 and PAP 09 in the phase one effort.



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

RECOMMENDED STANDARDS:

REQ.20.3 Smart Grid Standards Data Requirements Table

Introduction

This Business Practice Standard contains the list of data elements used in Business Practice Standards WEQ-016 and WEQ-018. Specific application of the data elements to a given use case contained in WEQ-016 and WEQ-018 are identified within the appropriate Business Practice Standard. This Business Practice Standard and data elements included herein are not intended to replace applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this standard.

REQ.20.3.1 Alphabetical Listing by Data Element Name

** Listing by Category ID and Category Element ID begins on page 46*

<u>Category</u>	<u>Category ID</u>	<u>Category Element ID</u>	<u>Data Element</u>	<u>Short Description</u>	<u>Long Description</u>	<u>Wholesale</u>			<u>Retail</u>		
						<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>	<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>
<u>2-Location</u>	<u>2</u>	<u>10</u>	<u>Address1</u>	<u>Address line 1</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>11</u>	<u>Address2</u>	<u>Address line 2</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
10-Ancillary Service Market	10	16	Ancillary Service Award - Cleared Price	Awarded Price	The market clearing price for the cleared ancillary service product MW.	-	-	Y	-	-	-
10-Ancillary Service Market	10	13	Ancillary Service Award - End Time	End Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.	-	-	Y	-	-	-
10-Ancillary Service Market	10	14	Ancillary Service Award - Interval Start Time	Start Time of the ancillary service Interval within the ancillary service Award and the ancillary service Value of the Time Interval	The start time of a specific ancillary service schedule interval	-	-	Y	-	-	-
10-Ancillary Service Market	10	15	Ancillary Service Award - Interval Value	The awarded Value for the Time Interval within the ancillary service Award	The value associated with a specific ancillary service schedule interval	-	-	Y	-	-	-
10-Ancillary Service Market	10	12	Ancillary Service Award - Start Time	Start Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.	-	-	Y	-	-	-
10-Ancillary Service Market	10	0	Ancillary Service Instruction ID	-	Unique identifier assigned to each ancillary service instruction.	-	-	Y	-	-	-
10-Ancillary Service Market	10	20	Ancillary Service Product Qualification Type	Type of Qualification	Examples include initial, requalification, etc.	-	-	Y	-	-	-



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
10-Ancillary Service Market	10	10	Ancillary Service Product Type	Type of Ancillary Service product(s) the Resource is enrolling to provide	-	-	-	Y	-	-	Y
10-Ancillary Service Market	10	22	Ancillary Service Product Type Qualification Date	Date of Qualification of the Resource	-	-	-	Y	-	-	-
10-Ancillary Service Market	10	23	Ancillary Service Product Type Qualified	Type of Ancillary Service Product(s) for which the Resource has Qualified	-	-	-	Y	-	-	-
10-Ancillary Service Market	10	17	Ancillary Service Schedule ID	-	Unique identifier assigned to each ancillary service schedule.	-	-	Y	-	-	-
6-Device and Qualification	6	229 4	ANSI Compliance	ANSI standard with which the Meter complies	-	-	-	Y	-	-	-
1-General Asset / Resource	1	30	Asset Group ID	The identifier of a group of assets	An Asset Group is a logical entity that has a reportable interval-level consumption.	-	-	Y	-	-	Y
1-General Asset / Resource	1	31	Asset Group Name	Name of the aggregated group of assets	-	-	-	Y	-	-	Y
1-General Asset / Resource	1	12	Asset ID	The unique identifier of the asset	-	-	-	Y	-	-	Y
6-Device and Qualification	6	83	Asset Manufacture Date	Date of Manufacture of the Asset	-	-	-	-	-	-	Y



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>6-Device and Qualification</u>	<u>6</u>	<u>80</u>	<u>Asset Manufacturer</u>	<u>Manufacturer of the Asset</u>	-	-	-	-	-	-	<u>Y</u>
<u>6-Device and Qualification</u>	<u>6</u>	<u>81</u>	<u>Asset Model</u>	<u>Model identifier of the Asset, assigned by the Manufacturer</u>	-	-	-	-	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>51</u>	<u>Asset Multiplier</u>	<u>Number of identical Assets within the Service Location</u>	-	-	-	<u>Y</u>	-	-	-
<u>1-General Asset / Resource</u>	<u>1</u>	<u>13</u>	<u>Asset Name</u>	<u>The name of the asset</u>	-	-	-	<u>Y</u>	-	-	-
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>90</u>	<u>Asset Operator ID</u>	<u>The identifier of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.</u>	-	-	-	-	-	-	<u>Y</u>
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>91</u>	<u>Asset Operator Name</u>	<u>The name of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.</u>	-	-	-	-	-	-	<u>Y</u>



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	92	Asset Owner ID	The Identifier of the business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).	-	-	-	-	-	-	Y
5-Business Entity Relationships	5	93	Asset Owner Name	The Name of business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).	-	-	-	-	-	-	Y
6-Device and Qualification	6	84	Asset Type	Type of Asset	Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.	-	-	-	-	-	Y
6-Device and Qualification	6	82	Asset Version	Model version identifier, assigned by the Manufacturer	-	-	-	-	-	-	Y
10-Ancillary Service Market	10	33	Base Load MW	Level of Load at time of dispatch	-	-	-	Y	-	-	-



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
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Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	20	Base Point	Per-interval dispatch instruction	A Dispatch is a real-time instruction to a Resource to move to a Base Point at a specific time (Resource-Specific Deployment) or a set of real-time instructions to multiple Resources (Bulk Deployment). A Resource-Specific Deployment is the deployment, via established Communication Methods initiated by the System Operator, of one or more discrete and/or unique Resources designated to provide a selected service.	-	-	Y	-	-	-
12-Event and Performance	12	21	Baseline Dates	Dates of days used to calculate the Energy Baseline	The Baseline Window is the window of time preceding, and optionally following, a Demand Response Event, over which electricity consumption data is collected for the purpose of establishing a Baseline. The applicability of this term is limited to Meter Before/Meter After, and Baseline Type-I and Type-II.	-	-	Y	-	-	Y
12-Event and Performance	12	22	Baseline Exclusion Dates	Dates of days Excluded from the calculation of the Energy Baseline	-	-	-	Y	-	-	Y
1-General Asset / Resource	1	51	Batch Load Flag	Flag set if the Resource is a Batch Load	-	-	-	Y	-	-	-
9-Energy Market	9	21	Breaker Status	Status of the Breaker for the Resource	-	-	-	Y	-	-	-



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>6-Device and Qualification</u>	<u>6</u>	<u>45</u>	<u>Breaker Status During Event</u>	<u>Status of the Breaker for the Service Location during an Emergency Event</u>	-	-	-	<u>Y</u>	-	-	-
<u>1-General Asset / Resource</u>	<u>1</u>	<u>50</u>	<u>Business Segment</u>	<u>SIC or NAICS code of the Service Location</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>43</u>	<u>Capable of Synchronizing to Grid</u>	<u>Flag set if the Service Location is capable of Synchronizing to the Grid</u>	-	-	-	<u>Y</u>	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	<u>991</u>	<u>Capacity Comments</u>	<u>Comments associated with the Capacity market</u>	-	-	-	<u>Y</u>	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	<u>31</u>	<u>Capacity Obligation Period</u>	<u>Period of time for which the Capacity Resource is Obligated</u>	<u>Examples include: month, season, year, etc.</u>	-	-	<u>Y</u>	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	<u>30</u>	<u>Capacity Obligation Period Type</u>	<u>Type of Capacity Obligation Time Period within which the Resource is obligated</u>	<u>Examples are: All hours, Business hours 1, Business hours 2, Business Hours 3, Non-Business hours.</u>	-	-	<u>Y</u>	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	<u>50</u>	<u>Capacity Reference ID</u>	<u>Identifier assigned to the External System award</u>	<u>An Award is the selection of a Resource to provide energy, ancillary services, or capacity for a future time period. Expressed as a string.</u>	-	-	<u>Y</u>	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	<u>41</u>	<u>Capacity Supply Obligation</u>	<u>Capacity Obligation</u>	<u>This may result from an auction or other clearing mechanism.</u>	-	-	<u>Y</u>	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>11-Capacity Market</u>	<u>11</u>	<u>10</u>	<u>Capacity Type</u>	<u>Type of Capacity</u>	<u>Capacity Service is a type of Demand Response service in which Demand Resources are obligated over a defined period of time to be available to deliver upon deployment by the System Operator or Service Provider. Examples: Hourly, Monthly, etc.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>11-Capacity Market</u>	<u>11</u>	<u>11</u>	<u>Capacity Type description</u>	<u>Description of the Type of Capacity</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>12</u>	<u>City</u>	<u>City</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>50</u>	<u>Competitive Choice Area</u>	<u>Flag set if the Service Location is in an area with Competitive Choice</u>	-	-	-	<u>Y</u>	-	-	-
<u>4-Grid Connection</u>	<u>4</u>	<u>12</u>	<u>Connect Voltage</u>	<u>Voltage level</u>	<u>Voltage at connection.</u>	-	-	<u>Y</u>	-	-	-
<u>2-Location</u>	<u>2</u>	<u>72</u>	<u>Connection Address</u>	<u>Address associated with the Connection Type</u>	<u>Example: Address of ICCP Connection, IP address</u>	-	-	<u>Y</u>	-	-	-
<u>2-Location</u>	<u>2</u>	<u>71</u>	<u>Connection Type</u>	<u>Additional type of connection associated with the Service Delivery Point</u>	<u>Example: ICCP Connection, IP address</u>	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>72</u>	<u>Constraint Interval</u>	<u>The timeframe over which the constraint type applies.</u>	<u>Typically daily, hourly, weekly, date</u>	-	-	<u>Y</u>	-	-	<u>Y</u>



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	71	Constraint Type	Type of operational, schedule or offer constraint	Types of operational, offer or schedule parameters. Examples include: Select Operational Minimum Runtime, Schedule Minimum Runtime, Operational Maximum Runtime, Schedule Maximum Runtime, Minimum Load, Maximum Load, Minimum Downtime, Minimum Starts, Maximum Energy, Maximum Starts, Time of Day schedule constraints, Black out date, Maximum consecutive days of participation, Maximum calls per day, Minimum Advanced Notification, Minimum duration of participation, etc.	-	-	Y	-	-	Y
8-Offer Parameters	8	73	Constraint Value	Value of the Constraint Type and Interval	-	-	-	Y	-	-	Y
3-Contact	3	31	Contact Address Data	Method-dependent Address of the Contact	This identifies specific information required for the contact method selected.	-	-	Y	-	-	-
3-Contact	3	991	Contact Comments	Comments associated with the Contact	-	-	-	Y	-	-	-
3-Contact	3	30	Contact Method	Method of communication with the Contact	This identifies the various types of communication options (phone, email, etc.) to be used.	-	-	Y	-	-	-
3-Contact	3	32	Contact Method Priority	Order in which a Communication Method should be selected for a Contact	A Communication Method is the medium by which an object communicates with another object for instruction, measurement, or control. The user specifies the sequence in which each medium is to be used when being contacted.	-	-	Y	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>3-Contact</u>	<u>3</u>	<u>23</u>	<u>Contact Middle Name</u>	<u>Middle Name of the Contact</u>	-	-	-	<u>Y</u>	-	-	-
<u>3-Contact</u>	<u>3</u>	<u>11</u>	<u>Contact Priority</u>	<u>Order in which this Contact should be selected</u>	<u>This is used when multiple contacts are defined.</u>	-	-	<u>Y</u>	-	-	-
<u>3-Contact</u>	<u>3</u>	<u>10</u>	<u>Contact Type</u>	<u>Interest code associated with a Contact</u>	<u>This is a classification defining the function a particular contact serves. It supports "who to call for what needs" decisions. Examples are: Primary, Secondary, Billing, Third Party, and Authorized Representative.</u>	-	-	<u>Y</u>	-	-	-
<u>2-Location</u>	<u>2</u>	<u>15</u>	<u>Country</u>	<u>Country</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>12-Event and Performance</u>	<u>12</u>	<u>51</u>	<u>Criticality Level</u>	This field defines the level of criticality of this event. The action taken by load control devices for an event can be solely based on this value, or combination with other Load Control Event fields supported by this device.	For example, additional fields such as Average Load Adjustment Percentage, Duty Cycle, Cooling Temperature Offset, Heating Temperature Offset, Cooling Temperature Set Point or Heating Temperature Set Point can be used in combination with the Criticality level. Criticality Level Level Description Participation 0 Reserved 1 Green Voluntary 2 1 Voluntary 3 2 Voluntary 4 3 Voluntary 5 4 Voluntary 6 5 Voluntary 7 Emergency Mandatory 8 Planned Outage Mandatory 9 Service Disconnect Mandatory 0x0A to 0x0F Utility Defined Utility Defined	-	-	-	-	-	Y
<u>6-Device and Qualification</u>	<u>6</u>	<u>291</u>	<u>CT Ratio</u>	Ratio of the Current Transformer	-	-	-	Y	-	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>15</u>	<u>Currency</u>	Economic unit of exchange in which the total price and price components are stated (e.g. dollars, euros)	-	Y	-	-	Y	-	Y
<u>6-Device and Qualification</u>	<u>6</u>	<u>228</u>	<u>Date of Last Meter Test</u>	Date of Last Test of the Meter	-	-	-	Y	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>31</u>	<u>Day Ahead Flag</u>	<u>Flag set if the Resource will be participating in the Day-Ahead market</u>	-	-	-	<u>Y</u>	-	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>38</u>	<u>Delivery Interval</u>	<u>The duration over which the product is available for physical consumption</u>	-	<u>Y</u>	-	-	<u>Y</u>	-	<u>Y</u>
<u>14-Price and Product</u>	<u>14</u>	<u>37</u>	<u>Delivery Time</u>	<u>Time at which the product is available for physical consumption</u>	-	<u>Y</u>	-	-	<u>Y</u>	-	<u>Y</u>
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>14</u>	<u>Demand Response Controlling Entity</u>	-	<u>An identifier for the Service Provider issuing the DR event deployment instructions.</u>	-	-	-	-	-	<u>Y</u>
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>13</u>	<u>Demand Response Provider</u>	-	<u>The entity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response products.</u>	-	-	-	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>16</u>	<u>Deployment MW</u>	<u>Absolute or relative Deployment quantity</u>	<u>Expressed as an absolute or relative (%) MW value.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>11</u>	<u>Deployment Type</u>	<u>Type of Deployment</u>	<u>Examples are: Advanced (Normal), Immediate, Audit/Test</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>80</u>	<u>Designated Dispatch Entity ID</u>	<u>Identifier assigned to the Designated Dispatch Entity</u>	<u>The Designated Dispatch Entity receives and processes Demand Resource Dispatch instructions or market information and may provide response information.</u>	-	-	<u>Y</u>	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	81	Designated Dispatch Entity Name	Name of the Designated Dispatch Entity	-	-	-	Y	-	-	-
6-Device and Qualification	6	70	Device Class	-	Note: From SEP2.0 Enumeration representing the Device Class to apply the current Load Control Event. 0 HVAC compressor or furnace 1 Strip Heaters/Baseboard Heaters 2 Water Heater 3 Pool Pump/Spa/Jacuzzi 4 Smart Appliances 5 Irrigation Pump 6 Managed Commercial & Industrial (C&I) loads 7 Simple misc. (Residential On/Off) loads 8 Exterior Lighting 9 Interior Lighting 10 Electric Vehicle 11 Generation Systems 12 to 15 Reserved	-	-	-	-	-	Y
6-Device and Qualification	6	991	Distributed Generator Comments	Comments associated with the Distributed Generator	-	-	-	Y	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>6-Device and Qualification</u>	<u>6</u>	<u>32</u>	<u>Distributed Generator Fuel Type</u>	<u>Type of Fuel consumed by the Distributed Generator</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>34</u>	<u>Distributed Generator Manufacturer</u>	<u>Manufacturer of the Distributed Generator</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>6-Device and Qualification</u>	<u>6</u>	<u>39</u>	<u>Distributed Generator Name</u>	<u>Name of the Distributed Generator</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>33</u>	<u>Distributed Generator Permit Type</u>	<u>Type of environmental authorization required to operate the Distributed Generator</u>	<u>The Environmental Authority is a regulatory authority responsible for the development, reporting, and enforcement of environmental activities.</u>	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>30</u>	<u>Distributed Generator Type</u>	<u>Type of Distributed Generator</u>	<u>This technology characteristic of the Distributed Generator, such as combined cycle, induction, etc.</u>	-	-	<u>Y</u>	-	-	-
<u>9-Energy Market</u>	<u>9</u>	<u>24</u>	<u>DR Bus Load MW</u>	<u>Instantaneous Bus Load of a Demand Resource providing Ancillary Services</u>	<u>Demand is the rate at which electric energy is being used by the customer (NERC Definition). Expressed in MW. This element only applies to DR</u>	-	-	<u>Y</u>	-	-	-



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>13-Direct Load Control</u>	<u>13</u>	<u>11</u>	<u>DR Control Command: Direct Load Control Type</u>	<u>The type of DR Direct Load Control Command: e.g. Set Point, Open/Close, Heating Temperature - offset/setpoint, Cooling Temperature - offset/setpoint, Load adjustment offset</u>	-	-	-	-	-	-	<u>Y</u>
<u>13-Direct Load Control</u>	<u>13</u>	<u>12</u>	<u>DR Control Command: Direct Load Control Value</u>	<u>Value associated with the Direct Load Control Type.</u>	-	-	-	-	-	-	<u>Y</u>
<u>1-General Asset / Resource</u>	<u>1</u>	<u>22</u>	<u>DR Resource Group ID</u>	<u>Grouping of Resources that can respond to the same DR signal</u>	-	-	-	-	-	-	<u>Y</u>
<u>3-Contact</u>	<u>3</u>	<u>12</u>	<u>DUNS Number</u>	<u>DUNS business number</u>	-	-	-	<u>Y</u>	-	-	-
<u>13-Direct Load Control</u>	<u>13</u>	<u>13</u>	<u>Duty Cycle</u>	<u>"Duty Cycle : Defines the maximum On state duty cycle as a percentage of time. Example, if the value is 80, the device would be in an "on state" for 80% of the time for the duration of the event. Range of the value is 0 to 100. A value of 0xFF indicates the field</u>	-	-	-	-	-	-	<u>Y</u>



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						<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>	<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>
				is not used." (from SEP2.0)							
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>21</u>	<u>Effective Enrollment Date</u>	<u>Effective Start Date for the Enrollment</u>	<u>Market Enrollment is the collection of enrollment or tariff data for a Demand Resource to provide a specific market product or service.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>40</u>	<u>Electrical Node ID</u>	<u>Identifier assigned to the Electrical Node at which the Service Location is connected</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>41</u>	<u>Electrical Node Name</u>	<u>Name of the Electrical Node at which the Service Location is connected</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>42</u>	<u>Electrical Node Type</u>	<u>Type of Electrical Node at which the Service Location is attached</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>24</u>	<u>Energy Baseline Timestamp</u>	<u>Timestamp of Energy Baseline</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>



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<u>12-Event and Performance</u>	<u>12</u>	<u>23</u>	<u>Energy Baseline Value</u>	<u>Calculated Energy Baseline</u>	<u>A Baseline is an estimate of the electricity that would have been consumed by a Demand Resource in the absence of a Demand Response Event. The Baseline is compared to the actual metered electricity consumption during the Demand Response Event to determine the Demand Modification Value. Depending on the type of Demand Response product or service, Baseline calculations may be performed in real time or after the fact.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>9-Energy Market</u>	<u>9</u>	<u>13</u>	<u>Energy Schedule - Cleared MW Interval Value</u>	<u>The Energy Value of cleared MW for the Time Interval within the Energy Schedule</u>	<u>The offered energy MW that have cleared the market.</u>	-	-	<u>Y</u>	-	-	-
<u>9-Energy Market</u>	<u>9</u>	<u>14</u>	<u>Energy Schedule - Cleared Price</u>	<u>Awarded Price</u>	<u>The market clearing price for the cleared energy MW.</u>	-	-	<u>Y</u>	-	-	-
<u>9-Energy Market</u>	<u>9</u>	<u>11</u>	<u>Energy Schedule - End Time</u>	<u>End Time of the Energy Schedule</u>	<u>A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).</u>	-	-	<u>Y</u>	-	-	-
<u>9-Energy Market</u>	<u>9</u>	<u>12</u>	<u>Energy Schedule - Interval Start Time</u>	<u>Start Time of the Energy Interval within the Energy Schedule</u>	<u>The start time of a specific energy schedule interval</u>	-	-	<u>Y</u>	-	-	-
<u>9-Energy Market</u>	<u>9</u>	<u>10</u>	<u>Energy Schedule - Start Time</u>	<u>Start Time of the Energy Schedule</u>	<u>A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).</u>	-	-	<u>Y</u>	-	-	<u>Y</u>



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<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>25</u>	<u>Enrollment End Date</u>	<u>Date of Termination of Enrollment</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>22</u>	<u>Enrollment Status</u>	<u>Status of the Enrollment for the Facility or Resource</u>	<u>Examples: Pending Enrollment, Approved Enrollment, Under Review, Denied, Separated</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>991</u>	<u>Event & Performance comments</u>	<u>Comments associated with Event and Performance data</u>	-	-	-	<u>Y</u>	-	-	-
<u>13-Direct Load Control</u>	<u>13</u>	<u>14</u>	<u>Event Control</u>	<u>Event Control options for randomized start or end times: 1= Randomize Start time, 0=Randomized Start not Applied 1= Randomize End time, 0=Randomized End not Applied. (from SEP2.0)</u>	-	-	-	-	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>12</u>	<u>Event Day</u>	<u>Operating Date of Start of Event</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>13</u>	<u>Event Description</u>	<u>Description of the Event</u>	-	-	-	<u>Y</u>	-	-	-



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>12-Event and Performance</u>	<u>12</u>	<u>18</u>	<u>Event End Time</u>	<u>Time of End of deployment period</u>	<u>Release/Recall is the notification, sent from the System Operator or Service Demand Response Provider to the Demand Resource, that the Deployment Period has ended or announcing the time that it will end.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>10</u>	<u>Event ID</u>	<u>Identifier assigned to the Event</u>	<u>An Event consists of the time periods, deadlines, and transitions during which Demand Resources perform. The System Operator shall specify the duration and applicability of a Demand Response Event. Some deadlines, time periods, and transitions may not be not applicable to all products or services.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>19</u>	<u>Event Modification Number</u>	<u>A modification number for the DR event. This is used to indicate if the DR Event has been modified by the Utility. Each time it is modified, this number is incremented.</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>112</u>	<u>Event Modification Reason Code</u>	<u>The reason the event is being cancelled or modified.</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>14</u>	<u>Event Start Time</u>	<u>Time of Start of deployment period for Event</u>	<u>The Deployment Period is the period of time from the Deployment to Release/Recall.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>12-Event and Performance</u>	<u>12</u>	<u>17</u>	<u>Event Status</u>	<u>Status of the Event</u>	<u>Examples include: initiated, completed, etc.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>13-Direct Load Control</u>	<u>13</u>	<u>15</u>	<u>Exception Conditions</u>	<u>This is used to report that the load controller may not behave as commanded because of a variety of conditions including:</u> • <u>Faults in device</u> • <u>Customer override.</u>	-	-	-	-	-	-	<u>Y</u>
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>991</u>	<u>External Entity Comments</u>	<u>Comments associated with the External Entity</u>	-	-	-	<u>Y</u>	-	-	-
<u>3-Contact</u>	<u>3</u>	<u>21</u>	<u>First Name</u>	<u>First Name of the Contact</u>	-	-	-	<u>Y</u>	-	-	-
<u>1-General Asset / Resource</u>	<u>1</u>	<u>41</u>	<u>GenBillingID</u>	<u>Billing Identifier assigned to the Resource</u>	-	-	-	<u>Y</u>	-	-	-
<u>1-General Asset / Resource</u>	<u>1</u>	<u>40</u>	<u>GenEMSID</u>	<u>Alias or point Identifier assigned to the Resource</u>	-	-	-	<u>Y</u>	-	-	-
<u>1-General Asset / Resource</u>	<u>1</u>	<u>991</u>	<u>General Resource Comments</u>	<u>General comments associated with the Resource</u>	-	-	-	<u>Y</u>	-	-	-
<u>2-Location</u>	<u>2</u>	<u>20</u>	<u>GPS Coordinates</u>	<u>Latitude and longitude</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>4-Grid Connection</u>	<u>4</u>	<u>991</u>	<u>Grid Connection Comments</u>	<u>Comments associated with the Grid Connection of the Resource</u>	-	-	-	<u>Y</u>	-	-	-



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>11</u>	<u>Have Engineering Diagram</u>	<u>Flag set if One-Line Diagrams have been submitted</u>	-	-	-	<u>Y</u>	-	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>13</u>	<u>Identifier Source (product)</u>	<u>The Identifier Source references the product identification scheme for the Product Identifier.</u>	-	<u>Y</u>	-	-	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>37</u>	<u>In-Service Date</u>	<u>Date the Distributed Generator became operational</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>36</u>	<u>Installation Date of Distributed Generator</u>	<u>Date of Installation of the Distributed Generator</u>	-	-	-	<u>Y</u>	-	-	-
<u>9-Energy Market</u>	<u>9</u>	<u>0</u>	<u>Instruction ID</u>	-	<u>Unique identifier assigned to each instruction.</u>	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>41</u>	<u>Interconnection Agreement Type</u>	<u>Type of Interconnection Agreement between the Distributed Generator or Service Location and the TDSP</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>42</u>	<u>Interconnection Limits</u>	<u>Limits associated with the Interconnection of the Distributed Generator or Service Location</u>	-	-	-	<u>Y</u>	-	-	-
<u>3-Contact</u>	<u>3</u>	<u>22</u>	<u>Last Name</u>	<u>Last Name of the Contact</u>	-	-	-	<u>Y</u>	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>30</u>	<u>Lead Time</u>	<u>Time between the advanced notification and deployment</u>	<u>Notification is the transmittal of a Deployment message.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>13-Direct Load Control</u>	<u>13</u>	<u>16</u>	<u>Load Control State</u>	<u>The state of the load, which includes both commanded states and user settings. This may include a schedule of future states if a particular control algorithm for the load controller is being executed.</u>	-	-	-	-	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>113</u>	<u>Load Level Value</u>	<u>Value of the load level to be achieved based on a set of enumerated values (e.g., moderate, high, etc.).</u>	-	-	-	-	-	-	<u>Y</u>
<u>6-Device and Qualification</u>	<u>6</u>	<u>52</u>	<u>Load Resource Control Device</u>	<u>Type of Control Device at a Service Location or deployed by a Response Method</u>	-	-	-	<u>Y</u>	-	-	-
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>30</u>	<u>Load Serving Entity ID</u>	<u>Identifier assigned to the LSE</u>	<u>The Load-Serving Entity serves end users and sells electric energy to end users.</u>	-	-	<u>Y</u>	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	31	Load Serving Entity Name	Name of the LSE	-	-	-	Y	-	-	-
2-Location	2	991	Location Comments	Comments associated with the Service Location	-	-	-	Y	-	-	-
4-Grid Connection	4	10	Loss Factor Type	Type of Loss Factor	-	-	-	Y	-	-	-
4-Grid Connection	4	11	Loss Factor Value	Loss Factor	Expressed as a decimal value.	-	-	Y	-	-	-
6-Device and Qualification	6	35	Manufactured Date of Distributed Generator	Date of Manufacturer of the Distributed Generator	-	-	-	Y	-	-	Y
7-Market / Program Enrollment	7	12	Market	Type of wholesale market	-	-	-	Y	-	-	-
8-Offer Parameters	8	40	Market Clearing Day	Market Clearing Day of the Offer	-	-	-	Y	-	-	-
7-Market / Program Enrollment	7	991	Market Enrollment Comments	Comments associated with the Enrollment	-	-	-	Y	-	-	-
7-Market / Program Enrollment	7	13	Market Product	Market Product	Product types include the following: energy, capacity, regulation, operating reserves (spinning or non-spin).	-	-	Y	-	-	Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>6-Device and Qualification</u>	<u>6</u>	<u>28</u>	<u>Maximum Error</u>	<u>Error of the Meter, including end-to-end Maximum Error</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>2293</u>	<u>Measurement Interval</u>	<u>Interval of time between Measurement readings</u>	<u>This is the time between electricity meter recordings. The Measurement records the consumption or supply of an End Device. An End Device is a physical end-use device that consumes or supplies electricity.</u>	-	-	<u>Y</u>	-	-	-
<u>12-Event and Performance</u>	<u>12</u>	<u>32</u>	<u>Measurement Value (CIM)</u>	<u>Value of the interval reading</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>31</u>	<u>Measurement Value Timestamp (CIM)</u>	<u>The time when the value was last updated</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>34</u>	<u>Measurement Value Type</u>	<u>The type of measurement value.</u>	<u>The Measurement Value Type identifies the type of information provided in the Measurement Value. For example, the Measurement Value type could be energy (kWh/MWh) or demand (KW or MW).</u>	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>26</u>	<u>Meter Accuracy Class</u>	<u>Accuracy Class of the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>2296</u>	<u>Meter Asset Comments</u>	<u>Comments associated with the Meter Asset</u>	-	-	-	<u>Y</u>	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>60</u>	<u>Meter Authority ID</u>	<u>Identifier assigned to the Metering Authority</u>	<u>The Metering Authority provides electric usage data necessary to determine the performance of a Resource.</u>	-	-	<u>Y</u>	-	-	-
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>61</u>	<u>Meter Authority Name</u>	<u>Name of the Metering Authority</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>10</u>	<u>Meter Configuration</u>	<u>Configuration of the Meter at the Facility</u>	<u>The CIM defines the Meter as the physical asset that performs the metering role of the ServiceDeliveryPoint. It is used for measuring consumption and detecting events.</u>	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>224</u>	<u>Meter Correction Factors</u>	<u>Device-specific Factors used to adjust for atmospheric changes at the point of installation of the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>227</u>	<u>Meter Device QA Plan</u>	<u>Quality Assurance plan for maintenance and testing of the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>20</u>	<u>Meter ID</u>	<u>Identifier assigned to the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>221</u>	<u>Meter Installation Date</u>	<u>Date of Installation of the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>50</u>	<u>Meter Installation Provider ID</u>	<u>Identifier assigned to the Meter Installation Provider</u>	-	-	-	<u>Y</u>	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	51	Meter Installation Provider Name	Name of the Meter Installation Provider	This is the competitive meter entity for the meter device.	-	-	Y	-	-	-
6-Device and Qualification	6	223	Meter Installer License	Professional License Number of the Installer of the Meter	-	-	-	Y	-	-	-
6-Device and Qualification	6	27	Meter Loss Compensation	Line Losses included in the Meter	-	-	-	Y	-	-	-
6-Device and Qualification	6	22	Meter Manufacturer	Manufacturer of the Meter	-	-	-	Y	-	-	-
6-Device and Qualification	6	23	Meter Model	Model of the Meter	-	-	-	Y	-	-	-
6-Device and Qualification	6	25	Meter Multiplier (kH)	Multiplier used to convert pulses into power units	-	-	-	Y	-	-	-
6-Device and Qualification	6	229 5	Meter Owner	Owner of the Meter	-	-	-	Y	-	-	-
6-Device and Qualification	6	29	Meter Phase	Specific Phase information	-	-	-	Y	-	-	-
6-Device and Qualification	6	229	Meter Qualification Date	Date of Qualification of the Meter by the Metering Authority or System Operator	-	-	-	Y	-	-	-
6-Device and Qualification	6	24	Meter Rating	Load Rating of the Meter	-	-	-	Y	-	-	-



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<u>6-Device and Qualification</u>	<u>6</u>	<u>225</u>	<u>Meter Test Criteria</u>	<u>Test Criteria required to qualify the installation of the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>226</u>	<u>Meter Test Frequency</u>	<u>Frequency of Tests of the Meter</u>	<u>Expressed in months.</u>	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>229</u> <u>1</u>	<u>Meter Test Results</u>	<u>Results of Tests of the Meter</u>	<u>These are specific to the meter type.</u>	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>21</u>	<u>Meter Type</u>	<u>Type of Meter installed at the Facility</u>	<u>Examples: RTU, CT/PT, etc.</u>	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>21</u>	<u>Min Gen MW</u>	<u>Minimum MW available for dispatch</u>	<u>When required as part of an enrollment request, this value acts as a default.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>22</u>	<u>MinGenCost</u>	<u>The cost per hour for each Min Gen MW value.</u>	<u>The cost per hour for each MinGenMW value.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>11-Capacity Market</u>	<u>11</u>	<u>40</u>	<u>Minimum Payment Nomination</u>	<u>Strike price for the economic dispatch of the energy component of the capacity program</u>	<u>Expressed in Price/MW.</u>	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>31</u>	<u>Nameplate Rating</u>	<u>Manufacturer's output rating of the Distributed Generator</u>	-	-	-	<u>Y</u>	-	-	-
<u>0-Common Message Parameters</u>	<u>0</u>	<u>20</u>	<u>NERC CIP Security - Availability</u>	<u>CIP Security Classification for Availability</u>	-	-	-	<u>Y</u>	-	-	-



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<u>0-Common Message Parameters</u>	<u>0</u>	<u>21</u>	<u>NERC CIP Security - Confidentiality</u>	<u>CIP Security Classification for Confidentiality</u>	-	-	-	<u>Y</u>	-	-	-
<u>0-Common Message Parameters</u>	<u>0</u>	<u>22</u>	<u>NERC CIP Security - Integrity</u>	<u>CIP Security Classification for Integrity</u>	-	-	-	<u>Y</u>	-	-	-
<u>2-Location</u>	<u>2</u>	<u>60</u>	<u>NERC Control Area</u>	<u>The NERC control area of the resource</u>	-	-	-	<u>Y</u>	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	<u>23</u>	<u>Nominal Capacity</u>	<u>Nominated load</u>	<u>Expressed as a decimal value.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>6-Device and Qualification</u>	<u>6</u>	<u>44</u>	<u>Normal Breaker Status</u>	<u>Status of the Breaker for the Service Location under Normal operating conditions</u>	<u>Normal Operations is the time following Release/Recall during which a System Operator or Service Provider may require a Demand Resource to have returned its Load consumption to normal levels and to be available again for Deployment.</u>	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>38</u>	<u>Normal Load Rating</u>	<u>Average load picked up by the Distributed Generator during the applicable performance hours</u>	-	-	-	<u>Y</u>	-	-	-
<u>12-Event and Performance</u>	<u>12</u>	<u>111</u>	<u>Notification Acknowledgement</u>	<u>This is an acknowledgement of the receipt of a DR notification or dispatch. It should include any necessary provisions for non-repudiation.</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>



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<u>8-Offer Parameters</u>	<u>8</u>	<u>38</u>	<u>Offer Commit Status</u>	<u>Commitment status of offer</u>	<u>Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>39</u>	<u>Offer Dispatch Status</u>	<u>Dispatch Status of Offer</u>	<u>Product-specific commitment status types included with offer. Examples include: economic, emergency, not participating, not qualified, and self-schedule.</u> <u>May also be used to temporarily opt out of DR Events and to override the normal operational constraints. The opt-out can be specified using the following criteria:</u> <u>• All events in a program indefinitely (unspecified time period)</u> <u>• Specific DR Event</u> <u>• All events in a specific time period.</u> <u>• Other triggered programs for which an asset or DR resource is already called upon (reduce double counting of available capacity)</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>30</u>	<u>Offer Dispatch Type</u>	<u>Type of Offer</u>	<u>Examples are Flexible (resource follows basepoint signals) or Fixed (resource requests DA commitment and RT schedules of 15 minutes or greater)</u>	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>36</u>	<u>Offer Expiration Date</u>	<u>Date of Expiration of the Offer</u>	<u>This applies to DAM only.</u>	-	-	<u>Y</u>	-	-	-



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Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>8-Offer Parameters</u>	<u>8</u>	<u>12</u>	<u>Offer Limit Interval</u>	<u>Offer Limit Interval</u>	<u>The period over which the offer limit applies, i.e., hour, day, etc.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>11</u>	<u>Offer Limit Type</u>	<u>Type of Offer Limit</u>	<u>The limit may be associated with the bidding parameters of a resource. These may include limit types such as seasonal rating, reasonability, economic and ramp limits.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>10</u>	<u>Offer Limit Value</u>	<u>Offer Limit Value</u>	<u>Expressed in MW or hours. Multiple Limit Types are applicable.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>331</u>	<u>Offer Price Curve Slope</u>	<u>Flag to smoothe offer segments from step function to slope</u>	-	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>33</u>	<u>Offer Segment Hour</u>	<u>Hour of Segment of the Offer</u>	<u>NOTE: When required as part of an enrollment request, this value becomes the default.</u>	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>31</u>	<u>Offer Segment MW</u>	<u>Energy of Segment of the Offer</u>	<u>The end value of the offer step, monotonically increasing, expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)</u>	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>32</u>	<u>Offer Segment Price</u>	<u>Price of Segment of the Offer</u>	<u>NOTE: When required as part of an enrollment request, this value becomes the default.</u>	-	-	<u>Y</u>	-	-	-
<u>12-Event and Performance</u>	<u>12</u>	<u>15</u>	<u>Operator Comment</u>	<u>Additional Event information provided by the Operator</u>	-	-	-	<u>Y</u>	-	-	-
<u>9-Energy Market</u>	<u>9</u>	<u>23</u>	<u>Output MVAR</u>	<u>Reactive Power Output of the Distributed Generator</u>	<u>Expressed in Mvar</u>	-	-	<u>Y</u>	-	-	-



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	22	Output MW	Real Power Output of the Distributed Generator	Expressed in MW	-	-	Y	-	-	-
14-Price and Product	14	30	Override Unit of Measure	Optional Attribute of Price object If this is used, then Unit of Measure is not applicable	-	Y	-	-	-	-	-
6-Device and Qualification	6	11	Parent Meter id	Flag set if the Meter is a Master or Parent Meter	-	-	-	Y	-	-	-
11-Capacity Market	11	22	Peak Date/Time	Date and Time of measurement of Peak	-	-	-	Y	-	-	-
11-Capacity Market	11	21	Peak Type	Type of measurement of Peak	Examples are: Annual, Monthly, Weekly, and Seasonal.	-	-	Y	-	-	-
11-Capacity Market	11	20	Peak Value	Measurement of Peak	-	-	-	Y	-	-	-
7-Market / Program Enrollment	7	51	Performance Evaluation Method	Method used to Evaluate the Performance of a Resource	Based on NAESB M&V terms.	-	-	Y	-	-	-
7-Market / Program Enrollment	7	50	Performance Evaluation Method Type Code	Code representing the Type of Measurement	-	-	-	Y	-	-	-
8-Offer Parameters	8	20	Physical Min Gen	Minimum Operating Level of a Resource	-	-	-	Y	-	-	Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	43	PNode	Name of the Price Node associated with the Service Location	The P-Node is the price location of the Service Location in the transmission and/or distribution network.	-	-	Y	-	-	Y
2-Location	2	44	PNode ID	Identifier assigned to the Price Node associated with the Service Location	-	-	-	Y	-	-	Y
8-Offer Parameters	8	50	Portfolio Name	Name of an aggregation of Resources for market participation	-	-	-	Y	-	-	-
14-Price and Product	14	33	Price Component Type	The portion of the price to which the corresponding value applies.	Examples: Energy, congestion, losses	Y	-	-	-	-	-
14-Price and Product	14	34	Price Component Value	The value of the price component.	-	Y	-	-	-	-	-
14-Price and Product	14	35	Price Location	The location at which the price is applicable.	-	Y	-	-	-	-	-
14-Price and Product	14	36	Price Type	Time characteristic of the price	The type of price (day-ahead, real-time, etc.).	Y	-	-	-	-	-
6-Device and Qualification	6	47	Private Use Network	Flag set if the Resource is an Electric Network connected to the transmission grid	This is used for load that is typically netted with internal generation.	-	-	Y	-	-	-
14-Price and Product	14	20	Product Identifier	Identifies specific product associated with the price	-	Y	-	-	Y	-	-



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>14-Price and Product</u>	<u>14</u>	<u>10</u>	<u>Product Name</u>	Same as 7.13 Market Product	An identifier for a particular electricity product offering: energy, capacity, ancillary services, etc.	<u>Y</u>	-	-	-	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>31</u>	<u>Product Price</u>	The sum of all Price Component Values for a given product (Total Price).		<u>Y</u>	-	-	-	-	<u>Y</u>
<u>14-Price and Product</u>	<u>14</u>	<u>32</u>	<u>Product Price Factor</u>	Terms of use attribute of Product Price	Examples: Price absolute, Price relative, Price multiplier	<u>Y</u>	-	-	<u>Y</u>	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>12</u>	<u>Product Sub-type</u>	Used to further define product types		<u>Y</u>	-	-	<u>Y</u>	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>11</u>	<u>Product Type</u>	Defines the source and product	Classifications used within industry for trading energy. Examples: PJM Energy, NYISO 10-min Spin, etc.	<u>Y</u>	-	-	-	-	<u>Y</u>
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>10</u>	<u>Program ID</u>	Program Identifier	The identifier of the program	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>11</u>	<u>Program Name</u>	Name of the Program		-	-	<u>Y</u>	-	-	<u>Y</u>
<u>6-Device and Qualification</u>	<u>6</u>	<u>222</u>	<u>PT Ratio</u>	Ratio of the Potential Transformer		-	-	<u>Y</u>	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	<u>24</u>	<u>Qualified Capacity</u>	Nominal ICAP derated for performance	Derated based on past performance.	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>25</u>	<u>Ramp Rate Direction</u>	Direction of the selected Ramp Rate Type and Ramp Rate Segment	Valid directions are: Upward, Downward, Both.	-	-	<u>Y</u>	-	-	<u>Y</u>



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Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>8-Offer Parameters</u>	<u>8</u>	<u>24</u>	<u>Ramp Rate Segment</u>	<u>Energy of Segment of the Ramp Rate</u>	<u>The end value of the Ramp Rate step, monotonically increasing or decreasing (as indicated by the Ramp Rate Direction), expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>23</u>	<u>Ramp Rate Type</u>	<u>Type of Ramp Rate</u>	<u>Examples are: Normal, Emergency, Regulation.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>26</u>	<u>Ramp Rate Value</u>	<u>Ramp Rate associated with the selected Ramp Rate Type for the selected Ramp Rate Segment and Ramp Rate Direction</u>	<u>The NERC definition of Ramp Rate is the rate, expressed in megawatts per minute, by which a generator changes its output. For a Demand Resource, the Ramp Rate is the rate, expressed in megawatts per minute, by which a Demand Resource changes its Load.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>32</u>	<u>Real Time Flag</u>	<u>Flag set if the Resource will be participating in the Real-Time market</u>	-	-	-	<u>Y</u>	-	-	-



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>32</u>	<u>Regulation Base Point</u>	<u>Per-interval Regulation dispatch instruction</u>	<u>Regulation Service is a type of Demand Response service in which a Demand Resource corrects for short-term changes in electricity use that might affect the stability of the power system, matching generation and load to maintain a desired frequency. Demand Resources providing Regulation Service are subject to dispatch continuously during a commitment period. Provision of Regulation Service does not correlate to Demand Response deployment terms of the Event timelines, deadlines and durations.</u>	-	-	<u>Y</u>	-	-	-
<u>0-Common Message Parameters</u>	<u>0</u>	<u>13</u>	<u>Rejection Code Type</u>	<u>Type of rejection message</u>	<u>Rejection code type is categorizing the different kinds of rejection messages associated with enrollment, qualification, offers or meter data. May be combined with comments to provide details beyond the type of rejection.</u>	-	-	<u>Y</u>	-	-	-
<u>0-Common Message Parameters</u>	<u>0</u>	<u>14</u>	<u>Rejection Code Value</u>	<u>Code referring to the reason for a rejection message</u>	<u>Rejection code related to the type of rejection. May be combined with comments to provide details beyond the type of rejection.</u>	-	-	<u>Y</u>	-	-	-
<u>12-Event and Performance</u>	<u>12</u>	<u>30</u>	<u>Reporting Interval</u>	<u>Interval size required for Reporting</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>24</u>	<u>Requalification Requirement</u>	<u>Flag set if Requalification is Required</u>	-	-	-	<u>Y</u>	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	26	Requalification Test Date	Date the Resource will retest its ability to deliver a product or service	-	-	-	Y	-	-	Y
10-Ancillary Service Market	10	31	Reserve Pickup Flag	Flag set if this is a Reserve Pickup schedule	Reserve Service is a type of Demand Response service in which Demand Resources are obligated to be available to provide Demand reduction Energy Service, based on reserve capacity requirements that are established to meet applicable reliability standards. Reserve Services are defined by short-term response rates (Ramp Period) and synchronization with the electricity grid (i.e., spinning and non-spinning reserves).	-	-	Y	-	-	-
1-General Asset / Resource	1	20	Resource ID	Identifier assigned to the Resource	A Resource may be an individual asset or a group of assets that represent a dispatchable entity.	-	-	Y	-	-	Y
1-General Asset / Resource	1	21	Resource Name	Name of the Resource	-	-	-	Y	-	-	-
7-Market / Program Enrollment	7	24	Resource Qualification Test Date	Date the Resource demonstrated its ability to deliver a product or service	-	-	-	Y	-	-	Y
7-Market / Program Enrollment	7	23	Resource Type	Type of Resource	Examples are: load reduction (curtailable or interruptible load), distributed generation, combination, renewable, storage, etc.	-	-	Y	-	-	Y
7-Market / Program	7	41	Response Method ID	Identifier assigned to the Response Method	-	-	-	Y	-	-	-



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>Enrollment</u>											
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>42</u>	<u>Response Method Name</u>	<u>Name of the Response Method</u>	-	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>40</u>	<u>Response Method Type</u>	<u>Type of Response Method</u>	<u>Expressed as a response type code</u>	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>43</u>	<u>Response Method Value</u>	<u>Value of the Response Method</u>	<u>The Demand Response Value is the quantity of modified electrical consumption by a Demand Resource, expressed as MW.</u>	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>34</u>	<u>Response Time</u>	<u>The amount of time before an asset/resource is capable of meeting its full performance, in response to a request by a Service Provider to shed load.</u>	-	-	-	-	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>33</u>	<u>Response Value</u>	<u>Response</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>44</u>	<u>Retail Rate</u>	<u>Retail Rate</u>	<u>Expressed as Price per kWh</u>	-	-	<u>Y</u>	-	-	-
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>41</u>	<u>Retail Rate Code</u>	<u>Code representing the Retail Rate for the Service Location</u>	-	-	-	<u>Y</u>	-	-	-



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<u>5-Business Entity Relationships</u>	<u>5</u>	<u>43</u>	<u>Retail Rate Description</u>	<u>Description of the Retail Rate</u>	<u>This can also be used for comments associated with the Retail Rate.</u>	-	-	<u>Y</u>	-	-	-
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>40</u>	<u>Retail Rate ID</u>	<u>Identifier assigned to the Retail Rate</u>	-	-	-	<u>Y</u>	-	-	-
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>42</u>	<u>Retail Rate Name</u>	<u>Name of the Retail Rate for the Service Location</u>	-	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>42</u>	<u>Schedule Description</u>	<u>Description of the Offer</u>	-	-	-	<u>Y</u>	-	-	-
<u>9-Energy Market</u>	<u>9</u>	<u>15</u>	<u>Schedule ID</u>	-	<u>Unique identifier assigned to each schedule.</u>	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>41</u>	<u>Schedule Name</u>	<u>Name or tag of the Offer</u>	-	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>43</u>	<u>Schedule Status</u>	<u>Status of the Offer</u>	-	-	-	<u>Y</u>	-	-	-
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>70</u>	<u>Scheduling Entity ID</u>	<u>Identifier assigned to the Scheduling Entity</u>	<u>A Scheduling Entity submits bids and/or offers and receives Schedules and Awards.</u>	-	-	<u>Y</u>	-	-	-
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>71</u>	<u>Scheduling Entity Name</u>	<u>Name of the Scheduling Entity</u>	-	-	-	<u>Y</u>	-	-	-



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<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>33</u>	<u>Self-Schedule Flag</u>	Flag set if the Resource is Self-Deploying	Self-Deployment is the Deployment via established Communication Methods initiated by the Service Provider or the Resource.	-	-	<u>Y</u>	-	-	-
<u>1-General Asset / Resource</u>	<u>1</u>	<u>10</u>	<u>Service Location ID</u>	Identifier assigned to the Service Location	The location at which connection to the transmission or distribution system is made.	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>1-General Asset / Resource</u>	<u>1</u>	<u>11</u>	<u>Service Location Name</u>	Name of the Service Location	-	-	-	<u>Y</u>	-	-	-
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>11</u>	<u>Service Provider ID</u>	Identifier assigned to the Service Provider	The Service Provider coordinates Resources to deliver electricity products and services to a market or distribution operator.	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>12</u>	<u>Service Provider Name</u>	Name of the Service Provider	-	-	-	<u>Y</u>	-	-	-
<u>9-Energy Market</u>	<u>9</u>	<u>25</u>	<u>Set Point</u>	Final dispatch target level	The real-time desired MW output signal calculated for a specific Resource by the Transmission Provider's control system on a specified periodicity that is equal to the current Energy Dispatch Target plus the Regulating Reserve Deployment instruction (which may be positive or negative) plus an adjustment to the Energy Dispatch Target to account for Contingency Reserve Deployment Instructions. The Setpoint Instruction represents the desired output level of the Resource.	-	-	<u>Y</u>	-	-	-



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<u>12-Event and Performance</u>	<u>12</u>	<u>50</u>	<u>Simple Signal Levels</u>	<u>Used as an alternate and simplified representation of the DR signal, whether it be price based or a dispatch. Takes on a small number of finite levels such as NORMAL, MODERATE, and HIGH, SPECIAL</u>	-	-	-	-	-	-	<u>Y</u>
<u>14-Price and Product</u>	<u>14</u>	<u>40</u>	<u>Source Location Identifier</u>	<u>The identifier of the source location of the product for which the price applies</u>	-	<u>Y</u>	-	-	<u>Y</u>	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>41</u>	<u>Source Location Identifier Type</u>	<u>The type of source location of the product for which the price applies</u>	-	<u>Y</u>	-	-	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>34</u>	<u>Startup Cost</u>	<u>Cost of starting a response activity</u>	<u>NOTE: When required as part of an enrollment request, this value becomes the default.</u>	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>37</u>	<u>Startup Cost Type</u>	<u>Type of startup cost</u>	<u>The type of Start Up Cost included in the offer. Options may include: Select cold, intermediate, hot or shutdown.</u>	-	-	<u>Y</u>	-	-	-
<u>2-Location</u>	<u>2</u>	<u>13</u>	<u>State/Province</u>	<u>State or Province two-letter code</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>



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<u>13-Direct Load Control</u>	<u>13</u>	<u>10</u>	<u>Status Check</u>	A signal to require the DR resource status to be sent back. (Only applicable to Direct Load Control)	-	-	-	-	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>35</u>	<u>Strike Price</u>	<u>Threshold Price</u>	<u>Expressed as a decimal value of price/MW.</u>	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>332</u>	<u>Strike Price Type</u>	<u>Type of strike price</u>	<u>Indicates the type of strike price. Options may include: buy or sell.</u>	-	-	<u>Y</u>	-	-	-
<u>0-Common Message Parameters</u>	<u>0</u>	<u>10</u>	<u>Submittal Date</u>	<u>Timestamp for the sender's use</u>	-	-	-	<u>Y</u>	-	-	-
<u>0-Common Message Parameters</u>	<u>0</u>	<u>11</u>	<u>Submitted By</u>	<u>User ID of submitter</u>	<u>Common data element to indicate the user ID of the entity submitting the data</u>	-	-	<u>Y</u>	-	-	-
<u>0-Common Message Parameters</u>	<u>0</u>	<u>12</u>	<u>Submitted Error</u>	<u>ID of submission error detected</u>	<u>Common data element to capture any errors or exceptions during submission</u>	-	-	<u>Y</u>	-	-	-
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>21</u>	<u>Synchronization Test Date</u>	<u>Target Date of Test of Synchronization to the grid</u>	-	-	-	<u>Y</u>	-	-	-
<u>3-Contact</u>	<u>3</u>	<u>13</u>	<u>Third Party</u>	<u>Flag set if the Contact is a third-party entity</u>	-	-	-	<u>Y</u>	-	-	-
<u>2-Location</u>	<u>2</u>	<u>22</u>	<u>Time Zone Name</u>	<u>Name of the Time Zone in which the Service Location is located</u>	-	-	-	<u>Y</u>	-	-	-



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>3-Contact</u>	<u>3</u>	<u>20</u>	<u>Title</u>	<u>Title of the Contact</u>	-	-	-	<u>Y</u>	-	-	-
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>22</u>	<u>Transmission / Distribution Service Provider Account Number</u>	<u>Transmission / Distribution Service Provider's account number for the Resource</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>20</u>	<u>Transmission / Distribution Service Provider ID</u>	<u>Identifier assigned to the Transmission / Distribution Service Provider</u>	<u>The Transmission / Distribution Service Provider operates a local electricity transmission and/or distribution system.</u>	-	-	<u>Y</u>	-	-	-
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>21</u>	<u>Transmission / Distribution Service Provider Name</u>	<u>Name of the Transmission / Distribution Service Provider</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>51</u>	<u>UFR Settings</u>	<u>Setting of the Under-Frequency Relay</u>	-	-	-	<u>Y</u>	-	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>14</u>	<u>Unit of Measure</u>	<u>Attribute of Product Identifier</u>	-	<u>Y</u>	-	-	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>52</u>	<u>Usage Information</u>	<u>Information about the near real time electricity usage of the DR Resource.</u>	-	-	-	-	-	-	<u>Y</u>



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>6-Device and Qualification</u>	<u>6</u>	<u>229</u> <u>2</u>	<u>VEE Compliance</u>	<u>Compliance standard for Validation, Editing, and Estimation</u>	<u>Validation, Editing, and Estimation is the process of taking raw meter data and performing validation and, as necessary, editing and estimation of corrupt or missing data, to create validated data. VEE guidelines are published in the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering, Volume Two, Published 12/05/00, http://www.naesb.org/REQ/req_form.asp.</u>	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>44</u>	<u>Verified Capability</u>	<u>Audited Capability</u>	<u>Auditing is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods AFTER the Enrollment process.</u>	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>45</u>	<u>Verified Capability Factor</u>	<u>Ratio of the Verified Capability to the qualified capability</u>	<u>Qualification is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods DURING the Enrollment process.</u>	-	-	<u>Y</u>	-	-	-
<u>2-Location</u>	<u>2</u>	<u>21</u>	<u>Weather Station</u>	<u>Weather Station code associated with the Service Location</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>6-Device and Qualification</u>	<u>6</u>	<u>46</u>	<u>Wholesale Delivery Point Status</u>	<u>Flag set if the Service Location is metered at the Wholesale level</u>	-	-	-	<u>Y</u>	-	-	-
<u>2-Location</u>	<u>2</u>	<u>14</u>	<u>Zip/Postal Code</u>	<u>Zip or Postal Code</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>31</u>	<u>Zone</u>	<u>Name of the Zone in which the Service Location is</u>	<u>A Zone is a physical or electrical region.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
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Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

<u>Category</u>	<u>Category ID</u>	<u>Category Element ID</u>	<u>Data Element</u>	<u>Short Description</u>	<u>Long Description</u>	<u>Wholesale</u>			<u>Retail</u>		
						<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>	<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>
				<u>located</u>							
<u>2-Location</u>	<u>2</u>	<u>30</u>	<u>Zone ID</u>	<u>Identifier assigned to the Zone in which the Service Location is located</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>32</u>	<u>Zone Type</u>	<u>Type of Zone</u>	<u>Examples: Capacity, Dispatch, Price, Load, etc.</u>	-	-	<u>Y</u>	-	-	-



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Listing by Category ID and Category Element ID

<u>Category</u>	<u>Category ID</u>	<u>Category Element ID</u>	<u>Data Element</u>	<u>Short Description</u>	<u>Long Description</u>	<u>Wholesale</u>			<u>Retail</u>		
						<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>	<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>
<u>0-Common Message Parameters</u>	<u>0</u>	-	<u>Common Message Parameters</u>	-	-	-	-	-	-	-	-
<u>0-Common Message Parameters</u>	<u>0</u>	<u>10</u>	<u>Submittal Date</u>	<u>Timestamp for the sender's use</u>	-	-	-	<u>Y</u>	-	-	-
<u>0-Common Message Parameters</u>	<u>0</u>	<u>11</u>	<u>Submitted By</u>	<u>User ID of submitter</u>	<u>Common data element to indicate the user ID of the entity submitting the data</u>	-	-	<u>Y</u>	-	-	-
<u>0-Common Message Parameters</u>	<u>0</u>	<u>12</u>	<u>Submitted Error</u>	<u>ID of submission error detected</u>	<u>Common data element to capture any errors or exceptions during submission</u>	-	-	<u>Y</u>	-	-	-
<u>0-Common Message Parameters</u>	<u>0</u>	<u>13</u>	<u>Rejection Code Type</u>	<u>Type of rejection message</u>	<u>Rejection code type is categorizing the different kinds of rejection messages associated with enrollment, qualification, offers or meter data. May be combined with comments to provide details beyond the type of rejection.</u>	-	-	<u>Y</u>	-	-	-
<u>0-Common Message Parameters</u>	<u>0</u>	<u>14</u>	<u>Rejection Code Value</u>	<u>Code referring to the reason for a rejection message</u>	<u>Rejection code related to the type of rejection. May be combined with comments to provide details beyond the type of rejection.</u>	-	-	<u>Y</u>	-	-	-



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
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Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
0-Common Message Parameters	0	20	NERC CIP Security - Availability	CIP Security Classification for Availability	-	-	-	<u>Y</u>	-	-	-
0-Common Message Parameters	0	21	NERC CIP Security - Confidentiality	CIP Security Classification for Confidentiality	-	-	-	<u>Y</u>	-	-	-
0-Common Message Parameters	0	22	NERC CIP Security - Integrity	CIP Security Classification for Integrity	-	-	-	<u>Y</u>	-	-	-
1-General Asset / Resource	1	-	General Asset/Resource	-	-	-	-	-	-	-	-
1-General Asset / Resource	1	10	Service Location ID	Identifier assigned to the Service Location	The location at which connection to the transmission or distribution system is made.	-	-	<u>Y</u>	-	-	<u>Y</u>
1-General Asset / Resource	1	11	Service Location Name	Name of the Service Location	-	-	-	<u>Y</u>	-	-	-
1-General Asset / Resource	1	12	Asset ID	The unique identifier of the asset	-	-	-	<u>Y</u>	-	-	<u>Y</u>
1-General Asset / Resource	1	13	Asset Name	The name of the asset	-	-	-	<u>Y</u>	-	-	-
1-General Asset / Resource	1	20	Resource ID	Identifier assigned to the Resource	A Resource may be an individual asset or a group of assets that represent a dispatchable entity.	-	-	<u>Y</u>	-	-	<u>Y</u>
1-General Asset / Resource	1	21	Resource Name	Name of the Resource	-	-	-	<u>Y</u>	-	-	-



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>1-General Asset / Resource</u>	<u>1</u>	<u>22</u>	<u>DR Resource Group ID</u>	<u>Grouping of Resources that can respond to the same DR signal</u>		-	-	-	-	-	<u>Y</u>
<u>1-General Asset / Resource</u>	<u>1</u>	<u>30</u>	<u>Asset Group ID</u>	<u>The identifier of a group of assets</u>	<u>An Asset Group is a logical entity that has a reportable interval-level consumption.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>1-General Asset / Resource</u>	<u>1</u>	<u>31</u>	<u>Asset Group Name</u>	<u>Name of the aggregated group of assets</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>1-General Asset / Resource</u>	<u>1</u>	<u>40</u>	<u>GenEMSID</u>	<u>Alias or point Identifier assigned to the Resource</u>	-	-	-	<u>Y</u>	-	-	-
<u>1-General Asset / Resource</u>	<u>1</u>	<u>41</u>	<u>GenBillingID</u>	<u>Billing Identifier assigned to the Resource</u>	-	-	-	<u>Y</u>	-	-	-
<u>1-General Asset / Resource</u>	<u>1</u>	<u>50</u>	<u>Business Segment</u>	<u>SIC or NAICS code of the Service Location</u>	-	-	-	<u>Y</u>	-	-	-
<u>1-General Asset / Resource</u>	<u>1</u>	<u>51</u>	<u>Batch Load Flag</u>	<u>Flag set if the Resource is a Batch Load</u>	-	-	-	<u>Y</u>	-	-	-
<u>1-General Asset / Resource</u>	<u>1</u>	<u>991</u>	<u>General Resource Comments</u>	<u>General comments associated with the Resource</u>	-	-	-	<u>Y</u>	-	-	-
<u>2-Location</u>	<u>2</u>	-	<u>Location</u>	-	-	-	-	-	-	-	-
<u>2-Location</u>	<u>2</u>	<u>10</u>	<u>Address1</u>	<u>Address line 1</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>11</u>	<u>Address2</u>	<u>Address line 2</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>12</u>	<u>City</u>	<u>City</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>13</u>	<u>State/Province</u>	<u>State or Province two-letter code</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

<u>Category</u>	<u>Category ID</u>	<u>Category Element ID</u>	<u>Data Element</u>	<u>Short Description</u>	<u>Long Description</u>	<u>Wholesale</u>			<u>Retail</u>		
						<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>	<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>
<u>2-Location</u>	<u>2</u>	<u>14</u>	<u>Zip/Postal Code</u>	<u>Zip or Postal Code</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>15</u>	<u>Country</u>	<u>Country</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>20</u>	<u>GPS Coordinates</u>	<u>Latitude and longitude</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>21</u>	<u>Weather Station</u>	<u>Weather Station code associated with the Service Location</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>22</u>	<u>Time Zone Name</u>	<u>Name of the Time Zone in which the Service Location is located</u>	-	-	-	<u>Y</u>	-	-	-
<u>2-Location</u>	<u>2</u>	<u>30</u>	<u>Zone ID</u>	<u>Identifier assigned to the Zone in which the Service Location is located</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>31</u>	<u>Zone</u>	<u>Name of the Zone in which the Service Location is located</u>	<u>A Zone is a physical or electrical region.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>32</u>	<u>Zone Type</u>	<u>Type of Zone</u>	<u>Examples: Capacity, Dispatch, Price, Load, etc.</u>	-	-	<u>Y</u>	-	-	-
<u>2-Location</u>	<u>2</u>	<u>40</u>	<u>Electrical Node ID</u>	<u>Identifier assigned to the Electrical Node at which the Service Location is connected</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>2-Location</u>	<u>2</u>	<u>41</u>	<u>Electrical Node Name</u>	<u>Name of the Electrical Node at which the Service Location is connected</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	42	Electrical Node Type	Type of Electrical Node at which the Service Location is attached	-	-	-	Y	-	-	Y
2-Location	2	43	PNode	Name of the Price Node associated with the Service Location	The P-Node is the price location of the Service Location in the transmission and/or distribution network.	-	-	Y	-	-	Y
2-Location	2	44	PNode ID	Identifier assigned to the Price Node associated with the Service Location	-	-	-	Y	-	-	Y
2-Location	2	50	Competitive Choice Area	Flag set if the Service Location is in an area with Competitive Choice	-	-	-	Y	-	-	-
2-Location	2	51	Asset Multiplier	Number of identical Assets within the Service Location	-	-	-	Y	-	-	-
2-Location	2	60	NERC Control Area	The NERC control area of the resource	-	-	-	Y	-	-	-
2-Location	2	71	Connection Type	Additional type of connection associated with the Service Delivery Point	Example: ICCP Connection, IP address	-	-	Y	-	-	-
2-Location	2	72	Connection Address	Address associated with the Connection Type	Example: Address of ICCP Connection, IP address	-	-	Y	-	-	-
2-Location	2	991	Location Comments	Comments associated with the Service Location	-	-	-	Y	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
3-Contact	3	-	Contact	-	-	-	-	-	-	-	-
3-Contact	3	10	Contact Type	Interest code associated with a Contact	This is a classification defining the function a particular contact serves. It supports "who to call for what needs" decisions. Examples are: Primary, Secondary, Billing, Third Party, and Authorized Representative.	-	-	Y	-	-	-
3-Contact	3	11	Contact Priority	Order in which this Contact should be selected	This is used when multiple contacts are defined.	-	-	Y	-	-	-
3-Contact	3	12	DUNS Number	DUNS business number	-	-	-	Y	-	-	-
3-Contact	3	13	Third Party	Flag set if the Contact is a third-party entity	-	-	-	Y	-	-	-
3-Contact	3	20	Title	Title of the Contact	-	-	-	Y	-	-	-
3-Contact	3	21	First Name	First Name of the Contact	-	-	-	Y	-	-	-
3-Contact	3	22	Last Name	Last Name of the Contact	-	-	-	Y	-	-	-
3-Contact	3	23	Contact Middle Name	Middle Name of the Contact	-	-	-	Y	-	-	-
3-Contact	3	30	Contact Method	Method of communication with the Contact	This identifies the various types of communication options (phone, email, etc.) to be used.	-	-	Y	-	-	-
3-Contact	3	31	Contact Address Data	Method-dependent Address of the Contact	This identifies specific information required for the contact method selected.	-	-	Y	-	-	-



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<u>Category</u>	<u>Category ID</u>	<u>Category Element ID</u>	<u>Data Element</u>	<u>Short Description</u>	<u>Long Description</u>	<u>Wholesale</u>			<u>Retail</u>		
						<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>	<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>
<u>3-Contact</u>	<u>3</u>	<u>32</u>	<u>Contact Method Priority</u>	<u>Order in which a Communication Method should be selected for a Contact</u>	<u>A Communication Method is the medium by which an object communicates with another object for instruction, measurement, or control. The user specifies the sequence in which each medium is to be used when being contacted.</u>	-	-	<u>Y</u>	-	-	-
<u>3-Contact</u>	<u>3</u>	<u>991</u>	<u>Contact Comments</u>	<u>Comments associated with the Contact</u>	-	-	-	<u>Y</u>	-	-	-
<u>4-Grid Connection</u>	<u>4</u>	-	<u>Grid Connection</u>	-	-	-	-	-	-	-	-
<u>4-Grid Connection</u>	<u>4</u>	<u>10</u>	<u>Loss Factor Type</u>	<u>Type of Loss Factor</u>	-	-	-	<u>Y</u>	-	-	-
<u>4-Grid Connection</u>	<u>4</u>	<u>11</u>	<u>Loss Factor Value</u>	<u>Loss Factor</u>	<u>Expressed as a decimal value.</u>	-	-	<u>Y</u>	-	-	-
<u>4-Grid Connection</u>	<u>4</u>	<u>12</u>	<u>Connect Voltage</u>	<u>Voltage level</u>	<u>Voltage at connection.</u>	-	-	<u>Y</u>	-	-	-
<u>4-Grid Connection</u>	<u>4</u>	<u>991</u>	<u>Grid Connection Comments</u>	<u>Comments associated with the Grid Connection of the Resource</u>	-	-	-	<u>Y</u>	-	-	-
<u>5-Business Entity Relationships</u>	<u>5</u>	-	<u>Business Entity Relationships</u>	-	-	-	-	-	-	-	-
<u>5-Business Entity Relationships</u>	<u>5</u>	<u>11</u>	<u>Service Provider ID</u>	<u>Identifier assigned to the Service Provider</u>	<u>The Service Provider coordinates Resources to deliver electricity products and services to a market or distribution operator.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	12	<u>Service Provider Name</u>	<u>Name of the Service Provider</u>	-	-	-	<u>Y</u>	-	-	-
5-Business Entity Relationships	5	13	<u>Demand Response Provider</u>	-	<u>The entity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response products.</u>	-	-	-	-	-	<u>Y</u>
5-Business Entity Relationships	5	14	<u>Demand Response Controlling Entity</u>	-	<u>An identifier for the Service Provider issuing the DR event deployment instructions.</u>	-	-	-	-	-	<u>Y</u>
5-Business Entity Relationships	5	20	<u>Transmission / Distribution Service Provider ID</u>	<u>Identifier assigned to the Transmission / Distribution Service Provider</u>	<u>The Transmission / Distribution Service Provider operates a local electricity transmission and/or distribution system.</u>	-	-	<u>Y</u>	-	-	-
5-Business Entity Relationships	5	21	<u>Transmission / Distribution Service Provider Name</u>	<u>Name of the Transmission / Distribution Service Provider</u>	-	-	-	<u>Y</u>	-	-	-
5-Business Entity Relationships	5	22	<u>Transmission / Distribution Service Provider Account Number</u>	<u>Transmission / Distribution Service Provider's account number for the Resource</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>



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For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	30	Load Serving Entity ID	Identifier assigned to the LSE	The Load-Serving Entity serves end users and sells electric energy to end users.	-	-	Y	-	-	-
5-Business Entity Relationships	5	31	Load Serving Entity Name	Name of the LSE	-	-	-	Y	-	-	-
5-Business Entity Relationships	5	40	Retail Rate ID	Identifier assigned to the Retail Rate	-	-	-	Y	-	-	-
5-Business Entity Relationships	5	41	Retail Rate Code	Code representing the Retail Rate for the Service Location	-	-	-	Y	-	-	-
5-Business Entity Relationships	5	42	Retail Rate Name	Name of the Retail Rate for the Service Location	-	-	-	Y	-	-	-
5-Business Entity Relationships	5	43	Retail Rate Description	Description of the Retail Rate	This can also be used for comments associated with the Retail Rate.	-	-	Y	-	-	-
5-Business Entity Relationships	5	44	Retail Rate	Retail Rate	Expressed as Price per kWh	-	-	Y	-	-	-
5-Business Entity Relationships	5	50	Meter Installation Provider ID	Identifier assigned to the Meter Installation Provider	-	-	-	Y	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	51	<u>Meter Installation Provider Name</u>	<u>Name of the Meter Installation Provider</u>	<u>This is the competitive meter entity for the meter device.</u>	-	-	<u>Y</u>	-	-	-
5-Business Entity Relationships	5	60	<u>Meter Authority ID</u>	<u>Identifier assigned to the Metering Authority</u>	<u>The Metering Authority provides electric usage data necessary to determine the performance of a Resource.</u>	-	-	<u>Y</u>	-	-	-
5-Business Entity Relationships	5	61	<u>Meter Authority Name</u>	<u>Name of the Metering Authority</u>	-	-	-	<u>Y</u>	-	-	-
5-Business Entity Relationships	5	70	<u>Scheduling Entity ID</u>	<u>Identifier assigned to the Scheduling Entity</u>	<u>A Scheduling Entity submits bids and/or offers and receives Schedules and Awards.</u>	-	-	<u>Y</u>	-	-	-
5-Business Entity Relationships	5	71	<u>Scheduling Entity Name</u>	<u>Name of the Scheduling Entity</u>	-	-	-	<u>Y</u>	-	-	-
5-Business Entity Relationships	5	80	<u>Designated Dispatch Entity ID</u>	<u>Identifier assigned to the Designated Dispatch Entity</u>	<u>The Designated Dispatch Entity receives and processes Demand Resource Dispatch instructions or market information and may provide response information.</u>	-	-	<u>Y</u>	-	-	-
5-Business Entity Relationships	5	81	<u>Designated Dispatch Entity Name</u>	<u>Name of the Designated Dispatch Entity</u>	-	-	-	<u>Y</u>	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	90	Asset Operator ID	The identifier of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.	-	-	-	-	-	-	Y
5-Business Entity Relationships	5	91	Asset Operator Name	The name of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.	-	-	-	-	-	-	Y
5-Business Entity Relationships	5	92	Asset Owner ID	The Identifier of the business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).	-	-	-	-	-	-	Y
5-Business Entity Relationships	5	93	Asset Owner Name	The Name of business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).	-	-	-	-	-	-	Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	991	External Entity Comments	Comments associated with the External Entity	-	-	-	Y	-	-	-
6-Device and Qualification	6	-	Device and Qualification	-	-	-	-	-	-	-	-
6-Device and Qualification	6	10	Meter Configuration	Configuration of the Meter at the Facility	The CIM defines the Meter as the physical asset that performs the metering role of the ServiceDeliveryPoint. It is used for measuring consumption and detecting events.	-	-	Y	-	-	-
6-Device and Qualification	6	11	Parent Meter id	Flag set if the Meter is a Master or Parent Meter	-	-	-	Y	-	-	-
6-Device and Qualification	6	20	Meter ID	Identifier assigned to the Meter	-	-	-	Y	-	-	-
6-Device and Qualification	6	21	Meter Type	Type of Meter installed at the Facility	Examples: RTU, CT/PT, etc.	-	-	Y	-	-	-
6-Device and Qualification	6	22	Meter Manufacturer	Manufacturer of the Meter	-	-	-	Y	-	-	-
6-Device and Qualification	6	221	Meter Installation Date	Date of Installation of the Meter	-	-	-	Y	-	-	-
6-Device and Qualification	6	222	PT Ratio	Ratio of the Potential Transformer	-	-	-	Y	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>6-Device and Qualification</u>	<u>6</u>	<u>223</u>	<u>Meter Installer License</u>	<u>Professional License Number of the Installer of the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>224</u>	<u>Meter Correction Factors</u>	<u>Device-specific Factors used to adjust for atmospheric changes at the point of installation of the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>225</u>	<u>Meter Test Criteria</u>	<u>Test Criteria required to qualify the installation of the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>226</u>	<u>Meter Test Frequency</u>	<u>Frequency of Tests of the Meter</u>	<u>Expressed in months.</u>	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>227</u>	<u>Meter Device QA Plan</u>	<u>Quality Assurance plan for maintenance and testing of the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>228</u>	<u>Date of Last Meter Test</u>	<u>Date of Last Test of the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>229</u>	<u>Meter Qualification Date</u>	<u>Date of Qualification of the Meter by the Metering Authority or System Operator</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>229 1</u>	<u>Meter Test Results</u>	<u>Results of Tests of the Meter</u>	<u>These are specific to the meter type.</u>	-	-	<u>Y</u>	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>6-Device and Qualification</u>	<u>6</u>	<u>229 2</u>	<u>VEE Compliance</u>	<u>Compliance standard for Validation, Editing, and Estimation</u>	<u>Validation, Editing, and Estimation is the process of taking raw meter data and performing validation and, as necessary, editing and estimation of corrupt or missing data, to create validated data. VEE guidelines are published in the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering, Volume Two, Published 12/05/00, http://www.naesb.org/REQ/req_form.asp.</u>	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>229 3</u>	<u>Measurement Interval</u>	<u>Interval of time between Measurement readings</u>	<u>This is the time between electricity meter recordings. The Measurement records the consumption or supply of an End Device. An End Device is a physical end-use device that consumes or supplies electricity.</u>	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>229 4</u>	<u>ANSI Compliance</u>	<u>ANSI standard with which the Meter complies</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>229 5</u>	<u>Meter Owner</u>	<u>Owner of the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>229 6</u>	<u>Meter Asset Comments</u>	<u>Comments associated with the Meter Asset</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>23</u>	<u>Meter Model</u>	<u>Model of the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>24</u>	<u>Meter Rating</u>	<u>Load Rating of the Meter</u>	-	-	-	<u>Y</u>	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>6-Device and Qualification</u>	<u>6</u>	<u>25</u>	<u>Meter Multiplier (kH)</u>	<u>Multiplier used to convert pulses into power units</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>26</u>	<u>Meter Accuracy Class</u>	<u>Accuracy Class of the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>27</u>	<u>Meter Loss Compensation</u>	<u>Line Losses included in the Meter</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>28</u>	<u>Maximum Error</u>	<u>Error of the Meter, including end-to-end Maximum Error</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>29</u>	<u>Meter Phase</u>	<u>Specific Phase information</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>291</u>	<u>CT Ratio</u>	<u>Ratio of the Current Transformer</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>30</u>	<u>Distributed Generator Type</u>	<u>Type of Distributed Generator</u>	<u>This technology characteristic of the Distributed Generator, such as combined cycle, induction, etc.</u>	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>31</u>	<u>Nameplate Rating</u>	<u>Manufacturer's output rating of the Distributed Generator</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>32</u>	<u>Distributed Generator Fuel Type</u>	<u>Type of Fuel consumed by the Distributed Generator</u>	-	-	-	<u>Y</u>	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>6-Device and Qualification</u>	<u>6</u>	<u>33</u>	<u>Distributed Generator Permit Type</u>	<u>Type of environmental authorization required to operate the Distributed Generator</u>	<u>The Environmental Authority is a regulatory authority responsible for the development, reporting, and enforcement of environmental activities.</u>	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>34</u>	<u>Distributed Generator Manufacturer</u>	<u>Manufacturer of the Distributed Generator</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>6-Device and Qualification</u>	<u>6</u>	<u>35</u>	<u>Manufactured Date of Distributed Generator</u>	<u>Date of Manufacturer of the Distributed Generator</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>6-Device and Qualification</u>	<u>6</u>	<u>36</u>	<u>Installation Date of Distributed Generator</u>	<u>Date of Installation of the Distributed Generator</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>37</u>	<u>In-Service Date</u>	<u>Date the Distributed Generator became operational</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>38</u>	<u>Normal Load Rating</u>	<u>Average load picked up by the Distributed Generator during the applicable performance hours</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>39</u>	<u>Distributed Generator Name</u>	<u>Name of the Distributed Generator</u>	-	-	-	<u>Y</u>	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>6-Device and Qualification</u>	<u>6</u>	<u>41</u>	<u>Interconnection Agreement Type</u>	<u>Type of Interconnection Agreement between the Distributed Generator or Service Location and the TDSP</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>42</u>	<u>Interconnection Limits</u>	<u>Limits associated with the Interconnection of the Distributed Generator or Service Location</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>43</u>	<u>Capable of Synchronizing to Grid</u>	<u>Flag set if the Service Location is capable of Synchronizing to the Grid</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>44</u>	<u>Normal Breaker Status</u>	<u>Status of the Breaker for the Service Location under Normal operating conditions</u>	<u>Normal Operations is the time following Release/Recall during which a System Operator or Service Provider may require a Demand Resource to have returned its Load consumption to normal levels and to be available again for Deployment.</u>	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>45</u>	<u>Breaker Status During Event</u>	<u>Status of the Breaker for the Service Location during an Emergency Event</u>	-	-	-	<u>Y</u>	-	-	-
<u>6-Device and Qualification</u>	<u>6</u>	<u>46</u>	<u>Wholesale Delivery Point Status</u>	<u>Flag set if the Service Location is metered at the Wholesale level</u>	-	-	-	<u>Y</u>	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	47	Private Use Network	Flag set if the Resource is an Electric Network connected to the transmission grid	This is used for load that is typically netted with internal generation.	-	-	Y	-	-	-
6-Device and Qualification	6	51	UFR Settings	Setting of the Under-Frequency Relay	-	-	-	Y	-	-	-
6-Device and Qualification	6	52	Load Resource Control Device	Type of Control Device at a Service Location or deployed by a Response Method	-	-	-	Y	-	-	-
6-Device and Qualification	6	70	Device Class	-	Note: From SEP2.0 Enumeration representing the Device Class to apply the current Load Control Event. 0 HVAC compressor or furnace 1 Strip Heaters/Baseboard Heaters 2 Water Heater 3 Pool Pump/Spa/Jacuzzi 4 Smart Appliances 5 Irrigation Pump 6 Managed Commercial & Industrial (C&I) loads 7 Simple misc. (Residential On/Off) loads 8 Exterior Lighting 9 Interior Lighting 10 Electric Vehicle 11 Generation Systems 12 to 15 Reserved	-	-	-	-	-	Y



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						<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>	<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>
<u>6-Device and Qualification</u>	<u>6</u>	<u>80</u>	<u>Asset Manufacturer</u>	<u>Manufacturer of the Asset</u>	-	-	-	-	-	-	<u>Y</u>
<u>6-Device and Qualification</u>	<u>6</u>	<u>81</u>	<u>Asset Model</u>	<u>Model identifier of the Asset, assigned by the Manufacturer</u>	-	-	-	-	-	-	<u>Y</u>
<u>6-Device and Qualification</u>	<u>6</u>	<u>82</u>	<u>Asset Version</u>	<u>Model version identifier, assigned by the Manufacturer</u>	-	-	-	-	-	-	<u>Y</u>
<u>6-Device and Qualification</u>	<u>6</u>	<u>83</u>	<u>Asset Manufacture Date</u>	<u>Date of Manufacture of the Asset</u>	-	-	-	-	-	-	<u>Y</u>
<u>6-Device and Qualification</u>	<u>6</u>	<u>84</u>	<u>Asset Type</u>	<u>Type of Asset</u>	<u>Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.</u>	-	-	-	-	-	<u>Y</u>
<u>6-Device and Qualification</u>	<u>6</u>	<u>991</u>	<u>Distributed Generator Comments</u>	<u>Comments associated with the Distributed Generator</u>	-	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	-	<u>Market/Program Enrollment</u>	-	-	-	-	-	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>10</u>	<u>Program ID</u>	<u>Program Identifier</u>	<u>The identifier of the program</u>	-	-	<u>Y</u>	-	-	<u>Y</u>



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7-Market / Program Enrollment	7	11	Program Name	Name of the Program	-	-	-	Y	-	-	Y
7-Market / Program Enrollment	7	12	Market	Type of wholesale market	-	-	-	Y	-	-	-
7-Market / Program Enrollment	7	13	Market Product	Market Product	Product types include the following: energy, capacity, regulation, operating reserves (spinning or non-spin).	-	-	Y	-	-	Y
7-Market / Program Enrollment	7	21	Effective Enrollment Date	Effective Start Date for the Enrollment	Market Enrollment is the collection of enrollment or tariff data for a Demand Resource to provide a specific market product or service.	-	-	Y	-	-	Y
7-Market / Program Enrollment	7	22	Enrollment Status	Status of the Enrollment for the Facility or Resource	Examples: Pending Enrollment, Approved Enrollment, Under Review, Denied, Separated	-	-	Y	-	-	Y
7-Market / Program Enrollment	7	23	Resource Type	Type of Resource	Examples are: load reduction (curtailable or interruptible load), distributed generation, combination, renewable, storage, etc.	-	-	Y	-	-	Y
7-Market / Program Enrollment	7	24	Resource Qualification Test Date	Date the Resource demonstrated its ability to deliver a product or service	-	-	-	Y	-	-	Y
7-Market / Program Enrollment	7	25	Enrollment End Date	Date of Termination of Enrollment	-	-	-	Y	-	-	Y



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Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>26</u>	<u>Requalification Test Date</u>	<u>Date the Resource will retest its ability to deliver a product or service</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>30</u>	<u>Lead Time</u>	<u>Time between the advanced notification and deployment</u>	<u>Notification is the transmittal of a Deployment message.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>31</u>	<u>Day Ahead Flag</u>	<u>Flag set if the Resource will be participating in the Day-Ahead market</u>	-	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>32</u>	<u>Real Time Flag</u>	<u>Flag set if the Resource will be participating in the Real-Time market</u>	-	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>33</u>	<u>Self-Schedule Flag</u>	<u>Flag set if the Resource is Self-Deploying</u>	<u>Self-Deployment is the Deployment via established Communication Methods initiated by the Service Provider or the Resource.</u>	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>34</u>	<u>Response Time</u>	<u>The amount of time before an asset/resource is capable of meeting its full performance, in response to a request by a Service Provider to shed load.</u>	-	-	-	-	-	-	<u>Y</u>
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>40</u>	<u>Response Method Type</u>	<u>Type of Response Method</u>	<u>Expressed as a response type code</u>	-	-	<u>Y</u>	-	-	-



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For Quadrant: REQ
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<u>Category</u>	<u>Category ID</u>	<u>Category Element ID</u>	<u>Data Element</u>	<u>Short Description</u>	<u>Long Description</u>	<u>Wholesale</u>			<u>Retail</u>		
						<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>	<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>41</u>	<u>Response Method ID</u>	<u>Identifier assigned to the Response Method</u>	-	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>42</u>	<u>Response Method Name</u>	<u>Name of the Response Method</u>	-	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>43</u>	<u>Response Method Value</u>	<u>Value of the Response Method</u>	<u>The Demand Response Value is the quantity of modified electrical consumption by a Demand Resource, expressed as MW.</u>	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>44</u>	<u>Verified Capability</u>	<u>Audited Capability</u>	<u>Auditing is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods AFTER the Enrollment process.</u>	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>45</u>	<u>Verified Capability Factor</u>	<u>Ratio of the Verified Capability to the qualified capability</u>	<u>Qualification is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods DURING the Enrollment process.</u>	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>50</u>	<u>Performance Evaluation Method Type Code</u>	<u>Code representing the Type of Measurement</u>	-	-	-	<u>Y</u>	-	-	-
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>51</u>	<u>Performance Evaluation Method</u>	<u>Method used to Evaluate the Performance of a Resource</u>	<u>Based on NAESB M&V terms.</u>	-	-	<u>Y</u>	-	-	-



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>7-Market / Program Enrollment</u>	<u>7</u>	<u>991</u>	<u>Market Enrollment Comments</u>	<u>Comments associated with the Enrollment</u>	-	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	-	<u>Offer Parameters</u>	-	-	-	-	-	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>10</u>	<u>Offer Limit Value</u>	<u>Offer Limit Value</u>	<u>Expressed in MW or hours. Multiple Limit Types are applicable.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>11</u>	<u>Offer Limit Type</u>	<u>Type of Offer Limit</u>	<u>The limit may be associated with the bidding parameters of a resource. These may include limit types such as seasonal rating, reasonability, economic and ramp limits.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>12</u>	<u>Offer Limit Interval</u>	<u>Offer Limit Interval</u>	<u>The period over which the offer limit applies, i.e., hour, day, etc.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>20</u>	<u>Physical Min Gen</u>	<u>Minimum Operating Level of a Resource</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>21</u>	<u>Min Gen MW</u>	<u>Minimum MW available for dispatch</u>	<u>When required as part of an enrollment request, this value acts as a default.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>22</u>	<u>MinGenCost</u>	<u>The cost per hour for each Min Gen MW value.</u>	<u>The cost per hour for each MinGenMW value.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>23</u>	<u>Ramp Rate Type</u>	<u>Type of Ramp Rate</u>	<u>Examples are: Normal, Emergency, Regulation.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>



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Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	24	Ramp Rate Segment	Energy of Segment of the Ramp Rate	The end value of the Ramp Rate step, monotonically increasing or decreasing (as indicated by the Ramp Rate Direction), expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)	-	-	Y	-	-	Y
8-Offer Parameters	8	25	Ramp Rate Direction	Direction of the selected Ramp Rate Type and Ramp Rate Segment	Valid directions are: Upward, Downward, Both.	-	-	Y	-	-	Y
8-Offer Parameters	8	26	Ramp Rate Value	Ramp Rate associated with the selected Ramp Rate Type for the selected Ramp Rate Segment and Ramp Rate Direction	The NERC definition of Ramp Rate is the rate, expressed in megawatts per minute, by which a generator changes its output. For a Demand Resource, the Ramp Rate is the rate, expressed in megawatts per minute, by which a Demand Resource changes its Load.	-	-	Y	-	-	Y
8-Offer Parameters	8	30	Offer Dispatch Type	Type of Offer	Examples are Flexible (resource follows basepoint signals) or Fixed (resource requests DA commitment and RT schedules of 15 minutes or greater)	-	-	Y	-	-	-
8-Offer Parameters	8	31	Offer Segment MW	Energy of Segment of the Offer	The end value of the offer step, monotonically increasing, expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)	-	-	Y	-	-	-
8-Offer Parameters	8	32	Offer Segment Price	Price of Segment of the Offer	NOTE: When required as part of an enrollment request, this value becomes the default.	-	-	Y	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>8-Offer Parameters</u>	<u>8</u>	<u>33</u>	<u>Offer Segment Hour</u>	<u>Hour of Segment of the Offer</u>	<u>NOTE: When required as part of an enrollment request, this value becomes the default.</u>	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>34</u>	<u>Startup Cost</u>	<u>Cost of starting a response activity</u>	<u>NOTE: When required as part of an enrollment request, this value becomes the default.</u>	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>35</u>	<u>Strike Price</u>	<u>Threshold Price</u>	<u>Expressed as a decimal value of price/MW.</u>	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>36</u>	<u>Offer Expiration Date</u>	<u>Date of Expiration of the Offer</u>	<u>This applies to DAM only.</u>	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>37</u>	<u>Startup Cost Type</u>	<u>Type of startup cost</u>	<u>The type of Start Up Cost included in the offer. Options may include: Select cold, intermediate, hot or shutdown.</u>	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>38</u>	<u>Offer Commit Status</u>	<u>Commitment status of offer</u>	<u>Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	39	Offer Dispatch Status	Dispatch Status of Offer	Product-specific commitment status types included with offer. Examples include: economic, emergency, not participating, not qualified, and self-schedule. May also be used to temporarily opt out of DR Events and to override the normal operational constraints. The opt-out can be specified using the following criteria: • All events in a program indefinitely (unspecified time period) • Specific DR Event • All events in a specific time period. • Other triggered programs for which an asset or DR resource is already called upon (reduce double counting of available capacity)	-	-	Y	-	-	Y
8-Offer Parameters	8	331	Offer Price Curve Slope	Flag to smoothe offer segments from step function to slope	-	-	-	Y	-	-	-
8-Offer Parameters	8	332	Strike Price Type	Type of strike price	Indicates the type of strike price. Options may include: buy or sell.	-	-	Y	-	-	-
8-Offer Parameters	8	40	Market Clearing Day	Market Clearing Day of the Offer	-	-	-	Y	-	-	-
8-Offer Parameters	8	41	Schedule Name	Name or tag of the Offer	-	-	-	Y	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>8-Offer Parameters</u>	<u>8</u>	<u>42</u>	<u>Schedule Description</u>	<u>Description of the Offer</u>	-	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>43</u>	<u>Schedule Status</u>	<u>Status of the Offer</u>	-	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>50</u>	<u>Portfolio Name</u>	<u>Name of an aggregation of Resources for market participation</u>	-	-	-	<u>Y</u>	-	-	-
<u>8-Offer Parameters</u>	<u>8</u>	<u>71</u>	<u>Constraint Type</u>	<u>Type of operational, schedule or offer constraint</u>	<u>Types of operational, offer or schedule parameters. Examples include: Select Operational Minimum Runtime, Schedule Minimum Runtime, Operational Maximum Runtime, Schedule Maximum Runtime, Minimum Load, Maximum Load, Minimum Downtime, Minimum Starts, Maximum Energy, Maximum Starts, Time of Day schedule constraints, Black out date, Maximum consecutive days of participation, Maximum calls per day, Minimum Advanced Notification, Minimum duration of participation, etc.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>72</u>	<u>Constraint Interval</u>	<u>The timeframe over which the constraint type applies.</u>	<u>Typically daily, hourly, weekly, date</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>8-Offer Parameters</u>	<u>8</u>	<u>73</u>	<u>Constraint Value</u>	<u>Value of the Constraint Type and Interval</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>9-Energy</u>	<u>9</u>	-	<u>Energy Market</u>	-	-	-	-	-	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
Market											
9-Energy Market	9	0	Instruction ID	-	Unique identifier assigned to each instruction.	-	-	Y	-	-	-
9-Energy Market	9	10	Energy Schedule - Start Time	Start Time of the Energy Schedule	A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).	-	-	Y	-	-	Y
9-Energy Market	9	11	Energy Schedule - End Time	End Time of the Energy Schedule	A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).	-	-	Y	-	-	-
9-Energy Market	9	12	Energy Schedule - Interval Start Time	Start Time of the Energy Interval within the Energy Schedule	The start time of a specific energy schedule interval	-	-	Y	-	-	-
9-Energy Market	9	13	Energy Schedule - Cleared MW Interval Value	The Energy Value of cleared MW for the Time Interval within the Energy Schedule	The offered energy MW that have cleared the market.	-	-	Y	-	-	-
9-Energy Market	9	14	Energy Schedule - Cleared Price	Awarded Price	The market clearing price for the cleared energy MW.	-	-	Y	-	-	-
9-Energy Market	9	15	Schedule ID	-	Unique identifier assigned to each schedule.	-	-	Y	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	20	Base Point	Per-interval dispatch instruction	A Dispatch is a real-time instruction to a Resource to move to a Base Point at a specific time (Resource-Specific Deployment) or a set of real-time instructions to multiple Resources (Bulk Deployment). A Resource-Specific Deployment is the deployment, via established Communication Methods initiated by the System Operator, of one or more discrete and/or unique Resources designated to provide a selected service.	-	-	Y	-	-	-
9-Energy Market	9	21	Breaker Status	Status of the Breaker for the Resource	-	-	-	Y	-	-	-
9-Energy Market	9	22	Output MW	Real Power Output of the Distributed Generator	Expressed in MW	-	-	Y	-	-	-
9-Energy Market	9	23	Output MVAR	Reactive Power Output of the Distributed Generator	Expressed in Mvar	-	-	Y	-	-	-
9-Energy Market	9	24	DR Bus Load MW	Instantaneous Bus Load of a Demand Resource providing Ancillary Services	Demand is the rate at which electric energy is being used by the customer (NERC Definition). Expressed in MW. This element only applies to DR	-	-	Y	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	25	Set Point	Final dispatch target level	The real-time desired MW output signal calculated for a specific Resource by the Transmission Provider's control system on a specified periodicity that is equal to the current Energy Dispatch Target plus the Regulating Reserve Deployment instruction (which may be positive or negative) plus an adjustment to the Energy Dispatch Target to account for Contingency Reserve Deployment Instructions. The Setpoint Instruction represents the desired output level of the Resource.	-	-	Y	-	-	-
10-Ancillary Service Market	10	-	Ancillary Service Market	-	-	-	-	-	-	-	-
10-Ancillary Service Market	10	0	Ancillary Service Instruction ID	-	Unique identifier assigned to each ancillary service instruction.	-	-	Y	-	-	-
10-Ancillary Service Market	10	10	Ancillary Service Product Type	Type of Ancillary Service product(s) the Resource is enrolling to provide	-	-	-	Y	-	-	Y
10-Ancillary Service Market	10	11	Have Engineering Diagram	Flag set if One-Line Diagrams have been submitted	-	-	-	Y	-	-	-
10-Ancillary Service Market	10	12	Ancillary Service Award - Start Time	Start Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.	-	-	Y	-	-	-



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<u>10-Ancillary Service Market</u>	<u>10</u>	<u>13</u>	<u>Ancillary Service Award - End Time</u>	<u>End Time of the ancillary service Award</u>	<u>A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.</u>	-	-	<u>Y</u>	-	-	-
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>14</u>	<u>Ancillary Service Award - Interval Start Time</u>	<u>Start Time of the ancillary service Interval within the ancillary service Award and the ancillary service Value of the Time Interval</u>	<u>The start time of a specific ancillary service schedule interval</u>	-	-	<u>Y</u>	-	-	-
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>15</u>	<u>Ancillary Service Award - Interval Value</u>	<u>The awarded Value for the Time Interval within the ancillary service Award</u>	<u>The value associated with a specific ancillary service schedule interval</u>	-	-	<u>Y</u>	-	-	-
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>16</u>	<u>Ancillary Service Award - Cleared Price</u>	<u>Awarded Price</u>	<u>The market clearing price for the cleared ancillary service product MW.</u>	-	-	<u>Y</u>	-	-	-
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>17</u>	<u>Ancillary Service Schedule ID</u>	-	<u>Unique identifier assigned to each ancillary service schedule.</u>	-	-	<u>Y</u>	-	-	-
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>20</u>	<u>Ancillary Service Product Qualification Type</u>	<u>Type of Qualification</u>	<u>Examples include initial, requalification, etc.</u>	-	-	<u>Y</u>	-	-	-
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>21</u>	<u>Synchronization Test Date</u>	<u>Target Date of Test of Synchronization to the grid</u>	-	-	-	<u>Y</u>	-	-	-



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<u>10-Ancillary Service Market</u>	<u>10</u>	<u>22</u>	<u>Ancillary Service Product Type Qualification Date</u>	<u>Date of Qualification of the Resource</u>	-	-	-	<u>Y</u>	-	-	-
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>23</u>	<u>Ancillary Service Product Type Qualified</u>	<u>Type of Ancillary Service Product(s) for which the Resource has Qualified</u>	-	-	-	<u>Y</u>	-	-	-
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>24</u>	<u>Requalification Requirement</u>	<u>Flag set if Requalification is Required</u>	-	-	-	<u>Y</u>	-	-	-
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>31</u>	<u>Reserve Pickup Flag</u>	<u>Flag set if this is a Reserve Pickup schedule</u>	<u>Reserve Service is a type of Demand Response service in which Demand Resources are obligated to be available to provide Demand reduction Energy Service, based on reserve capacity requirements that are established to meet applicable reliability standards. Reserve Services are defined by short-term response rates (Ramp Period) and synchronization with the electricity grid (i.e., spinning and non-spinning reserves).</u>	-	-	<u>Y</u>	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>32</u>	<u>Regulation Base Point</u>	<u>Per-interval Regulation dispatch instruction</u>	<u>Regulation Service is a type of Demand Response service in which a Demand Resource corrects for short-term changes in electricity use that might affect the stability of the power system, matching generation and load to maintain a desired frequency. Demand Resources providing Regulation Service are subject to dispatch continuously during a commitment period. Provision of Regulation Service does not correlate to Demand Response deployment terms of the Event timelines, deadlines and durations.</u>	-	-	<u>Y</u>	-	-	-
<u>10-Ancillary Service Market</u>	<u>10</u>	<u>33</u>	<u>Base Load MW</u>	<u>Level of Load at time of dispatch</u>	-	-	-	<u>Y</u>	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	-	<u>Capacity Market</u>	-	-	-	-	-	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	<u>10</u>	<u>Capacity Type</u>	<u>Type of Capacity</u>	<u>Capacity Service is a type of Demand Response service in which Demand Resources are obligated over a defined period of time to be available to deliver upon deployment by the System Operator or Service Provider. Examples: Hourly, Monthly, etc.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>11-Capacity Market</u>	<u>11</u>	<u>11</u>	<u>Capacity Type description</u>	<u>Description of the Type of Capacity</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>11-Capacity Market</u>	<u>11</u>	<u>20</u>	<u>Peak Value</u>	<u>Measurement of Peak</u>	-	-	-	<u>Y</u>	-	-	-



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>11-Capacity Market</u>	<u>11</u>	<u>21</u>	<u>Peak Type</u>	<u>Type of measurement of Peak</u>	<u>Examples are: Annual, Monthly, Weekly, and Seasonal.</u>	-	-	<u>Y</u>	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	<u>22</u>	<u>Peak Date/Time</u>	<u>Date and Time of measurement of Peak</u>	-	-	-	<u>Y</u>	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	<u>23</u>	<u>Nominal Capacity</u>	<u>Nominated load</u>	<u>Expressed as a decimal value.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>11-Capacity Market</u>	<u>11</u>	<u>24</u>	<u>Qualified Capacity</u>	<u>Nominal ICAP derated for performance</u>	<u>Derated based on past performance.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>11-Capacity Market</u>	<u>11</u>	<u>30</u>	<u>Capacity Obligation Period Type</u>	<u>Type of Capacity Obligation Time Period within which the Resource is obligated</u>	<u>Examples are: All hours, Business hours 1, Business hours 2, Business Hours 3, Non-Business hours.</u>	-	-	<u>Y</u>	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	<u>31</u>	<u>Capacity Obligation Period</u>	<u>Period of time for which the Capacity Resource is Obligated</u>	<u>Examples include: month, season, year, etc.</u>	-	-	<u>Y</u>	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	<u>40</u>	<u>Minimum Payment Nomination</u>	<u>Strike price for the economic dispatch of the energy component of the capacity program</u>	<u>Expressed in Price/MW.</u>	-	-	<u>Y</u>	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	<u>41</u>	<u>Capacity Supply Obligation</u>	<u>Capacity Obligation</u>	<u>This may result from an auction or other clearing mechanism.</u>	-	-	<u>Y</u>	-	-	-
<u>11-Capacity Market</u>	<u>11</u>	<u>50</u>	<u>Capacity Reference ID</u>	<u>Identifier assigned to the External System award</u>	<u>An Award is the selection of a Resource to provide energy, ancillary services, or capacity for a future time period. Expressed as a string.</u>	-	-	<u>Y</u>	-	-	-



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Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

<u>Category</u>	<u>Category ID</u>	<u>Category Element ID</u>	<u>Data Element</u>	<u>Short Description</u>	<u>Long Description</u>	<u>Wholesale</u>			<u>Retail</u>		
						<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>	<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>
<u>11-Capacity Market</u>	<u>11</u>	<u>991</u>	<u>Capacity Comments</u>	<u>Comments associated with the Capacity market</u>	-	-	-	<u>Y</u>	-	-	-
<u>12-Event and Performance</u>	<u>12</u>	-	<u>Event and Performance</u>	-	-	-	-	-	-	-	-
<u>12-Event and Performance</u>	<u>12</u>	<u>10</u>	<u>Event ID</u>	<u>Identifier assigned to the Event</u>	<u>An Event consists of the time periods, deadlines, and transitions during which Demand Resources perform. The System Operator shall specify the duration and applicability of a Demand Response Event. Some deadlines, time periods, and transitions may not be not applicable to all products or services.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>11</u>	<u>Deployment Type</u>	<u>Type of Deployment</u>	<u>Examples are: Advanced (Normal), Immediate, Audit/Test</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>12</u>	<u>Event Day</u>	<u>Operating Date of Start of Event</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>13</u>	<u>Event Description</u>	<u>Description of the Event</u>	-	-	-	<u>Y</u>	-	-	-
<u>12-Event and Performance</u>	<u>12</u>	<u>14</u>	<u>Event Start Time</u>	<u>Time of Start of deployment period for Event</u>	<u>The Deployment Period is the period of time from the Deployment to Release/Recall.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>15</u>	<u>Operator Comment</u>	<u>Additional Event information provided by the Operator</u>	-	-	-	<u>Y</u>	-	-	-



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>12-Event and Performance</u>	<u>12</u>	<u>16</u>	<u>Deployment MW</u>	<u>Absolute or relative Deployment quantity</u>	<u>Expressed as an absolute or relative (%) MW value.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>17</u>	<u>Event Status</u>	<u>Status of the Event</u>	<u>Examples include: initiated, completed, etc.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>18</u>	<u>Event End Time</u>	<u>Time of End of deployment period</u>	<u>Release/Recall is the notification, sent from the System Operator or Service Demand Response Provider to the Demand Resource, that the Deployment Period has ended or announcing the time that it will end.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>19</u>	<u>Event Modification Number</u>	<u>A modification number for the DR event. This is used to indicate if the DR Event has been modified by the Utility. Each time it is modified, this number is incremented.</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>111</u>	<u>Notification Acknowledgement</u>	<u>This is an acknowledgement of the receipt of a DR notification or dispatch. It should include any necessary provisions for non-repudiation.</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>



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<u>Category</u>	<u>Category ID</u>	<u>Category Element ID</u>	<u>Data Element</u>	<u>Short Description</u>	<u>Long Description</u>	<u>Wholesale</u>			<u>Retail</u>		
						<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>	<u>PAP 03</u>	<u>PAP 04</u>	<u>PAP 09</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>112</u>	<u>Event Modification Reason Code</u>	<u>The reason the event is being cancelled or modified.</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>113</u>	<u>Load Level Value</u>	<u>Value of the load level to be achieved based on a set of enumerated values (e.g., moderate, high, etc.).</u>	-	-	-	-	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>21</u>	<u>Baseline Dates</u>	<u>Dates of days used to calculate the Energy Baseline</u>	<u>The Baseline Window is the window of time preceding, and optionally following, a Demand Response Event, over which electricity consumption data is collected for the purpose of establishing a Baseline. The applicability of this term is limited to Meter Before/Meter After, and Baseline Type-I and Type-II.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>22</u>	<u>Baseline Exclusion Dates</u>	<u>Dates of days Excluded from the calculation of the Energy Baseline</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>12-Event and Performance</u>	<u>12</u>	<u>23</u>	<u>Energy Baseline Value</u>	<u>Calculated Energy Baseline</u>	<u>A Baseline is an estimate of the electricity that would have been consumed by a Demand Resource in the absence of a Demand Response Event. The Baseline is compared to the actual metered electricity consumption during the Demand Response Event to determine the Demand Modification Value. Depending on the type of Demand Response product or service, Baseline calculations may be performed in real time or after the fact.</u>	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>24</u>	<u>Energy Baseline Timestamp</u>	<u>Timestamp of Energy Baseline</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>30</u>	<u>Reporting Interval</u>	<u>Interval size required for Reporting</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>31</u>	<u>Measurement Value Timestamp (CIM)</u>	<u>The time when the value was last updated</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>32</u>	<u>Measurement Value (CIM)</u>	<u>Value of the interval reading</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>33</u>	<u>Response Value</u>	<u>Response</u>	-	-	-	<u>Y</u>	-	-	<u>Y</u>



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>12-Event and Performance</u>	<u>12</u>	<u>34</u>	<u>Measurement Value Type</u>	<u>The type of measurement value.</u>	<u>The Measurement Value Type identifies the type of information provided in the Measurement Value. For example, the Measurement Value type could be energy (kWh/MWh) or demand (KW or MW).</u>	-	-	<u>Y</u>	-	-	-
<u>12-Event and Performance</u>	<u>12</u>	<u>50</u>	<u>Simple Signal Levels</u>	<u>Used as an alternate and simplified representation of the DR signal, whether it be price based or a dispatch. Takes on a small number of finite levels such as NORMAL, MODERATE, and HIGH, SPECIAL</u>	-	-	-	-	-	-	<u>Y</u>



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>12-Event and Performance</u>	<u>12</u>	<u>51</u>	<u>Criticality Level</u>	<u>This field defines the level of criticality of this event. The action taken by load control devices for an event can be solely based on this value, or combination with other Load Control Event fields supported by this device.</u>	For example, additional fields such as Average Load Adjustment Percentage, Duty Cycle, Cooling Temperature Offset, Heating Temperature Offset, Cooling Temperature Set Point or Heating Temperature Set Point can be used in combination with the Criticality level. <u>Criticality Level Level Description Participation</u> 0 Reserved 1 Green Voluntary 2 1 Voluntary 3 2 Voluntary 4 3 Voluntary 5 4 Voluntary 6 5 Voluntary 7 Emergency Mandatory 8 Planned Outage Mandatory 9 Service Disconnect Mandatory 0x0A to 0x0F Utility Defined Utility Defined	-	-	-	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>52</u>	<u>Usage Information</u>	<u>Information about the near real time electricity usage of the DR Resource.</u>	-	-	-	-	-	-	<u>Y</u>
<u>12-Event and Performance</u>	<u>12</u>	<u>991</u>	<u>Event & Performance comments</u>	<u>Comments associated with Event and Performance data</u>	-	-	-	<u>Y</u>	-	-	-
<u>13-Direct Load Control</u>	<u>13</u>	-	<u>Direct Load Control</u>	-	-	-	-	-	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>13-Direct Load Control</u>	<u>13</u>	<u>10</u>	<u>Status Check</u>	A signal to require the DR resource status to be sent back. (Only applicable to Direct Load Control)	-	-	-	-	-	-	<u>Y</u>
<u>13-Direct Load Control</u>	<u>13</u>	<u>11</u>	<u>DR Control Command: Direct Load Control Type</u>	The type of DR Direct Load Control Command: e.g. Set Point, Open/Close, Heating Temperature - offset/setpoint, Cooling Temperature - offset/setpoint, Load adjustment offset	-	-	-	-	-	-	<u>Y</u>
<u>13-Direct Load Control</u>	<u>13</u>	<u>12</u>	<u>DR Control Command: Direct Load Control Value</u>	Value associated with the Direct Load Control Type.	-	-	-	-	-	-	<u>Y</u>
<u>13-Direct Load Control</u>	<u>13</u>	<u>13</u>	<u>Duty Cycle</u>	"Duty Cycle : Defines the maximum On state duty cycle as a percentage of time. Example, if the value is 80, the device would be in an "on state" for 80% of the time for the duration of the event. Range of the value is 0 to 100. A value	-	-	-	-	-	-	<u>Y</u>



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
				of 0xFF indicates the field is not used." (from SEP2.0)							
<u>13-Direct Load Control</u>	<u>13</u>	<u>14</u>	<u>Event Control</u>	Event Control options for randomized start or end times: 1= Randomize Start time, 0=Randomized Start not Applied 1= Randomize End time, 0=Randomized End not Applied. (from SEP2.0)	-	-	-	-	-	-	<u>Y</u>
<u>13-Direct Load Control</u>	<u>13</u>	<u>15</u>	<u>Exception Conditions</u>	This is used to report that the load controller may not behave as commanded because of a variety of conditions including: • Faults in device • Customer override.	-	-	-	-	-	-	<u>Y</u>



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<u>13-Direct Load Control</u>	<u>13</u>	<u>16</u>	<u>Load Control State</u>	The state of the load, which includes both commanded states and user settings. This may include a schedule of future states if a particular control algorithm for the load controller is being executed.	-	-	-	-	-	-	Y
<u>14-Price and Product</u>	<u>14</u>	-	<u>Price and Product</u>	-	-	-	-	-	-	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>10</u>	<u>Product Name</u>	Same as 7.13 Market Product	An identifier for a particular electricity product offering: energy, capacity, ancillary services, etc.	Y	-	-	-	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>11</u>	<u>Product Type</u>	Defines the source and product	Classifications used within industry for trading energy. Examples: PJM Energy, NYISO 10-min Spin, etc.	Y	-	-	-	-	Y
<u>14-Price and Product</u>	<u>14</u>	<u>12</u>	<u>Product Sub-type</u>	Used to further define product types	-	Y	-	-	Y	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>13</u>	<u>Identifier Source (product)</u>	The Identifier Source references the product identification scheme for the Product Identifier.	-	Y	-	-	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
<u>14-Price and Product</u>	<u>14</u>	<u>14</u>	<u>Unit of Measure</u>	<u>Attribute of Product Identifier</u>	-	<u>Y</u>	-	-	-	-	<u>Y</u>
<u>14-Price and Product</u>	<u>14</u>	<u>15</u>	<u>Currency</u>	<u>Economic unit of exchange in which the total price and price components are stated (e.g. dollars, euros)</u>	-	<u>Y</u>	-	-	<u>Y</u>	-	<u>Y</u>
<u>14-Price and Product</u>	<u>14</u>	<u>20</u>	<u>Product Identifier</u>	<u>Identifies specific product associated with the price</u>	-	<u>Y</u>	-	-	<u>Y</u>	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>30</u>	<u>Override Unit of Measure</u>	<u>Optional Attribute of Price object</u> <u>If this is used, then Unit of Measure is not applicable</u>	-	<u>Y</u>	-	-	-	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>31</u>	<u>Product Price</u>	<u>The sum of all Price Component Values for a given product (Total Price).</u>	-	<u>Y</u>	-	-	-	-	<u>Y</u>
<u>14-Price and Product</u>	<u>14</u>	<u>32</u>	<u>Product Price Factor</u>	<u>Terms of use attribute of Product Price</u>	<u>Examples: Price absolute, Price relative, Price multiplier</u>	<u>Y</u>	-	-	<u>Y</u>	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>33</u>	<u>Price Component Type</u>	<u>The portion of the price to which the corresponding value applies.</u>	<u>Examples: Energy, congestion, losses</u>	<u>Y</u>	-	-	-	-	-
<u>14-Price and Product</u>	<u>14</u>	<u>34</u>	<u>Price Component Value</u>	<u>The value of the price component.</u>	-	<u>Y</u>	-	-	-	-	-



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
14-Price and Product	14	35	Price Location	The location at which the price is applicable.		Y	-	-	-	-	-
14-Price and Product	14	36	Price Type	Time characteristic of the price	The type of price (day-ahead, real-time, etc.).	Y	-	-	-	-	-
14-Price and Product	14	37	Delivery Time	Time at which the product is available for physical consumption		Y	-	-	Y	-	Y
14-Price and Product	14	38	Delivery Interval	The duration over which the product is available for physical consumption		Y	-	-	Y	-	Y
14-Price and Product	14	40	Source Location Identifier	The identifier of the source location of the product for which the price applies		Y	-	-	Y	-	-
14-Price and Product	14	41	Source Location Identifier Type	The type of source location of the product for which the price applies		Y	-	-	-	-	-



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03, PAP 04 and PAP 09

4. Supporting Documentation

a. Description of Request:

2010 REQ Annual Plan Item 9 and 2010 WEQ Annual Plan Item 6 – “Develop Smart Grid Wholesale and Retail Electric Standards”

b. Description of Recommendation:

This recommendation provides the data requirements related to the use cases developed for Priority Action Plan 03 and 09 as part of the phase one effort

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the development of standard DR and DER signals.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- March 11, 2010 Meeting Notes – To be posted
- March 18, 2010 Meeting Notes – To be posted
- March 25, 2010 Meeting Notes – To be posted
- April 1, 2010 Meeting Notes – To be posted
- April 8, 2010 Meeting Notes – To be posted
- April 29, 2010 Meeting Notes – To be posted
- May 13, 2010 Meeting Notes – To be posted
- May 20, 2010 Meeting Notes – To be posted
- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes – To be posted
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03, PAP 04 and PAP 09

- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc
- September 9, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes – To be posted



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data [Requirements Elements](#) List for Business Practice Standards associated with NIST PAP 03 and PAP 09

1. RECOMMENDED ACTION:

☒ Accept as requested
☐ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☒ Initiation
☐ Modification
☐ Interpretation
☐ Withdrawal

☐ Principle
☐ Definition
☐ Business Practice Standard
☐ Document
☒ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☒ Initiation
☐ Modification
☐ Interpretation
☐ Withdrawal

☐ Principle
☐ Definition
☐ Business Practice Standard
☐ Document
☒ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY: The Master Data [Requirements Elements](#) List contains the list of data elements used in the use cases that were developed for PAP 03 and PAP 09 in the phase one effort.



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PAP 03 and PAP 09



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RECOMMENDED STANDARDS:

REQ.20.3 Smart Grid Standards Data **RequirementsElements** Table

Introduction

This Business Practice Standard contains the list of data elements used in Business Practice Standards WEQ-016 and WEQ-018. Specific application of the data elements to a given use case contained in WEQ-016 and WEQ-018 are identified within the appropriate Business Practice Standard. This Business Practice Standard and data elements included herein are not intended to (i) require the use of any of these data elements, (ii) require the provision or purchase of any products, programs, rates, markets or services, or (iii) supersede~~replace~~ applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this standard.

REQ.20.3.1 Alphabetical Listing by Data Element Name

* Listing by Category ID and Category Element ID begins on page ~~464~~**42**

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	10	Address1	Address line 1				Y			Y
2-Location	2	11	Address2	Address line 2				Y			Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
10-Ancillary Service Market	10	16	Ancillary Service Award - Cleared Price	Awarded Price	The market clearing price for the cleared ancillary service product MW.			Y			
10-Ancillary Service Market	10	13	Ancillary Service Award - End Time	End Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.			Y			
10-Ancillary Service Market	10	14	Ancillary Service Award - Interval Start Time	Start Time of the ancillary service Interval within the ancillary service Award and the ancillary service Value of the Time Interval	The start time of a specific ancillary service schedule interval			Y			
10-Ancillary Service Market	10	15	Ancillary Service Award - Interval Value	The awarded Value for the Time Interval within the ancillary service Award	The value associated with a specific ancillary service schedule interval			Y			
10-Ancillary Service Market	10	12	Ancillary Service Award - Start Time	Start Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.			Y			
10-Ancillary Service Market	10	0	Ancillary Service Instruction ID		Unique identifier assigned to each ancillary service instruction.			Y			
10-Ancillary Service Market	10	20	Ancillary Service Product Qualification Type	Type of Qualification	Examples include initial, requalification, etc.			Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
10-Ancillary Service Market	10	10	Ancillary Service Product Type	Type of Ancillary Service product(s) the Resource is enrolling to provide				Y			Y
10-Ancillary Service Market	10	22	Ancillary Service Product Type Qualification Date	Date of Qualification of the Resource				Y			
10-Ancillary Service Market	10	23	Ancillary Service Product Type Qualified	Type of Ancillary Service Product(s) for which the Resource has Qualified				Y			
10-Ancillary Service Market	10	17	Ancillary Service Schedule ID		Unique identifier assigned to each ancillary service schedule.			Y			
6-Device and Qualification	6	229 4	ANSI Compliance	ANSI standard with which the Meter complies				Y			
1-General Asset / Resource	1	30	Asset Group ID	The identifier of a group of assets	An Asset Group is a logical entity that has a reportable interval-level consumption.			Y			Y
1-General Asset / Resource	1	31	Asset Group Name	Name of the aggregated group of assets				Y			Y
1-General Asset / Resource	1	12	Asset ID	The unique identifier of the asset				Y			Y
6-Device and Qualification	6	83	Asset Manufacture Date	Date of Manufacture of the Asset							Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	80	Asset Manufacturer	Manufacturer of the Asset							Y
6-Device and Qualification	6	81	Asset Model	Model identifier of the Asset, assigned by the Manufacturer							Y
2-Location	2	51	Asset Multiplier	Number of identical Assets within the Service Location				Y			
1-General Asset / Resource	1	13	Asset Name	The name of the asset				Y			
5-Business Entity Relationships	5	90	Asset Operator ID	The identifier of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.							Y
5-Business Entity Relationships	5	91	Asset Operator Name	The name of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.							Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	92	Asset Owner ID	The Identifier of the business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).							Y
5-Business Entity Relationships	5	93	Asset Owner Name	The Name of business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).							Y
6-Device and Qualification	6	84	Asset Type	Type of Asset	Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.						Y
6-Device and Qualification	6	82	Asset Version	Model version identifier, assigned by the Manufacturer							Y
10-Ancillary Service Market	10	33	Base Load MW	Level of Load at time of dispatch				Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	20	Base Point	Per-interval dispatch instruction	A Dispatch is a real-time instruction to a Resource to move to a Base Point at a specific time (Resource-Specific Deployment) or a set of real-time instructions to multiple Resources (Bulk Deployment). A Resource-Specific Deployment is the deployment, via established Communication Methods initiated by the System Operator, of one or more discrete and/or unique Resources designated to provide a selected service.			Y			
12-Event and Performance	12	21	Baseline Dates	Dates of days used to calculate the Energy Baseline	The Baseline Window is the window of time preceding, and optionally following, a Demand Response Event, over which electricity consumption data is collected for the purpose of establishing a Baseline. The applicability of this term is limited to Meter Before/Meter After, and Baseline Type-I and Type-II.			Y			Y
12-Event and Performance	12	22	Baseline Exclusion Dates	Dates of days Excluded from the calculation of the Energy Baseline				Y			Y
1-General Asset / Resource	1	51	Batch Load Flag	Flag set if the Resource is a Batch Load				Y			
9-Energy Market	9	21	Breaker Status	Status of the Breaker for the Resource				Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	45	Breaker Status During Event	Status of the Breaker for the Service Location during an Emergency Event				Y			
1-General Asset / Resource	1	50	Business Segment	SIC or NAICS code of the Service Location				Y			
6-Device and Qualification	6	43	Capable of Synchronizing to Grid	Flag set if the Service Location is capable of Synchronizing to the Grid				Y			
11-Capacity Market	11	991	Capacity Comments	Comments associated with the Capacity market				Y			
11-Capacity Market	11	31	Capacity Obligation Period	Period of time for which the Capacity Resource is Obligated	Examples include: month, season, year, etc.			Y			
11-Capacity Market	11	30	Capacity Obligation Period Type	Type of Capacity Obligation Time Period within which the Resource is obligated	Examples are: All hours, Business hours 1, Business hours 2, Business Hours 3, Non-Business hours.			Y			
11-Capacity Market	11	50	Capacity Reference ID	Identifier assigned to the External System award	An Award is the selection of a Resource to provide energy, ancillary services, or capacity for a future time period. Expressed as a string.			Y			
11-Capacity Market	11	41	Capacity Supply Obligation	Capacity Obligation	This may result from an auction or other clearing mechanism.			Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
11-Capacity Market	11	10	Capacity Type	Type of Capacity	Capacity Service is a type of Demand Response service in which Demand Resources are obligated over a defined period of time to be available to deliver upon deployment by the System Operator or Service Provider. Examples: Hourly, Monthly, etc.			Y			Y
11-Capacity Market	11	11	Capacity Type description	Description of the Type of Capacity				Y			Y
2-Location	2	12	City	City				Y			Y
2-Location	2	50	Competitive Choice Area	Flag set if the Service Location is in an area with Competitive Choice				Y			
4-Grid Connection	4	12	Connect Voltage	Voltage level	Voltage at connection.			Y			
2-Location	2	72	Connection Address	Address associated with the Connection Type	Example: Address of ICCP Connection, IP address			Y			
2-Location	2	71	Connection Type	Additional type of connection associated with the Service Delivery Point	Example: ICCP Connection, IP address			Y			
8-Offer Parameters	8	72	Constraint Interval	The timeframe over which the constraint type applies.	Typically daily, hourly, weekly, date			Y			Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	71	Constraint Type	Type of operational, schedule or offer constraint	Types of operational, offer or schedule parameters. Examples include: Select Operational Minimum Runtime, Schedule Minimum Runtime, Operational Maximum Runtime, Schedule Maximum Runtime, Minimum Load, Maximum Load, Minimum Downtime, Minimum Starts, Maximum Energy, Maximum Starts, Time of Day schedule constraints, Black out date, Maximum consecutive days of participation, Maximum calls per day, Minimum Advanced Notification, Minimum duration of participation, etc.			Y			Y
8-Offer Parameters	8	73	Constraint Value	Value of the Constraint Type and Interval				Y			Y
3-Contact	3	31	Contact Address Data	Method-dependent Address of the Contact	This identifies specific information required for the contact method selected.			Y			
3-Contact	3	991	Contact Comments	Comments associated with the Contact				Y			
3-Contact	3	30	Contact Method	Method of communication with the Contact	This identifies the various types of communication options (phone, email, etc.) to which may be used.			Y			
3-Contact	3	32	Contact Method Priority	Order in which a Communication Method should be selected for a Contact	A Communication Method is the medium by which an object communicates with another object for instruction, measurement, or control. The user specifies the sequence in which each medium is to be used when being contacted.			Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
3-Contact	3	23	Contact Middle Name	Middle Name of the Contact				Y			
3-Contact	3	11	Contact Priority	Order in which this Contact should be selected	This is used when multiple contacts are defined.			Y			
3-Contact	3	10	Contact Type	Interest code associated with a Contact	This is a classification defining the function a particular contact serves. It supports "who to call for what needs" decisions. Examples are: Primary, Secondary, Billing, Third Party, and Authorized Representative.			Y			
2-Location	2	15	Country	Country				Y			Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	51	Criticality Level	This field defines the level of criticality of this event. The action taken by load control devices for an event can be solely based on this value, or in combination with other Load Control Event fields supported by this device.	For example, additional fields such as Average Load Adjustment Percentage, Duty Cycle, Cooling Temperature Offset, Heating Temperature Offset, Cooling Temperature Set Point or Heating Temperature Set Point can be used in combination with the Criticality level. Criticality Level Level Description Participation 0 Reserved 1 Green Voluntary 2 1 Voluntary 3 2 Voluntary 4 3 Voluntary 5 4 Voluntary 6 5 Voluntary 7 Emergency Mandatory 8 Planned Outage Mandatory 9 Service Disconnect Mandatory 0x0A to 0x0F Utility Defined Utility						Y
6-Device and Qualification	6	291	CT Ratio	Ratio of the Current Transformer				Y			
14-Price and Product	14	15	Currency	Economic unit of exchange in which the total price and price components are stated (e.g. dollars, euros)		Y			Y		Y
6-Device and Qualification	6	228	Date of Last Meter Test	Date of Last Test of the Meter				Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	31	Day Ahead Flag	Flag set if the Resource will be participating in the Day-Ahead market				Y			
14-Price and Product	14	38	Delivery Interval	The duration over which the product is available for physical consumption		Y			Y		Y
14-Price and Product	14	37	Delivery Time	Time at which the product is available for physical consumption		Y			Y		Y
5-Business Entity Relationships	5	14	Demand Response Controlling Entity		An identifier for the Service Provider issuing the DR event deployment instructions.						Y
5-Business Entity Relationships	5	13	Demand Response Provider		The entity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response products.						Y
12-Event and Performance	12	16	Deployment MW	Absolute or relative Deployment quantity	Expressed as an absolute or relative (%) MW value.			Y			Y
12-Event and Performance	12	11	Deployment Type	Type of Deployment	Examples are: Advanced (Normal), Immediate, Audit/Test			Y			Y
5-Business Entity Relationships	5	80	Designated Dispatch Entity ID	Identifier assigned to the Designated Dispatch Entity	The Designated Dispatch Entity receives and processes Demand Resource Dispatch instructions or market information and may provide response information.			Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	81	Designated Dispatch Entity Name	Name of the Designated Dispatch Entity				Y			
6-Device and Qualification	6	70	Device Class		Note: From SEP2.0 Enumeration representing the Device Class to apply the current Load Control Event. 0 HVAC compressor or furnace 1 Strip Heaters/Baseboard Heaters 2 Water Heater 3 Pool Pump/Spa/Jacuzzi 4 Smart Appliances 5 Irrigation Pump 6 Managed Commercial & Industrial (C&I) loads 7 Simple misc. (Residential On/Off) loads 8 Exterior Lighting 9 Interior Lighting 10 Electric Vehicle 11 Generation Systems 12 to 15 Reserved						Y
6-Device and Qualification	6	991	Distributed Generator Comments	Comments associated with the Distributed Generator				Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	32	Distributed Generator Fuel Type	Type of Fuel consumed by the Distributed Generator				Y			
6-Device and Qualification	6	34	Distributed Generator Manufacturer	Manufacturer of the Distributed Generator				Y			Y
6-Device and Qualification	6	39	Distributed Generator Name	Name of the Distributed Generator				Y			
6-Device and Qualification	6	33	Distributed Generator Permit Type	Type of environmental authorization required to operate the Distributed Generator	The Environmental Authority is a regulatory authority responsible for the development, reporting, and enforcement of environmental activities.			Y			
6-Device and Qualification	6	30	Distributed Generator Type	Type of Distributed Generator	This technology characteristic of the Distributed Generator, such as combined cycle, induction, etc.			Y			
9-Energy Market	9	24	DR Bus Load MW	Instantaneous Bus Load of a Demand Resource providing Ancillary Services	Demand is the rate at which electric energy is being used by the customer (NERC Definition). Expressed in MW. This element only applies to DR			Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
13-Direct Load Control	13	11	DR Control Command: Direct Load Control Type	The type of DR Direct Load Control Command: e.g. Set Point, Open/Close, Heating Temperature - offset/setpoint, Cooling Temperature - offset/setpoint, Load adjustment offset							Y
13-Direct Load Control	13	12	DR Control Command: Direct Load Control Value	Value associated with the Direct Load Control Type.							Y
1-General Asset / Resource	1	22	DR Resource Group ID	Grouping of Resources that can respond to the same DR signal							Y
3-Contact	3	12	DUNS Number	DUNS business number				Y			
13-Direct Load Control	13	13	Duty Cycle	"Duty Cycle : Defines the maximum On state duty cycle as a percentage of time. Example, if the value is 80, the device would be in an "on state" for 80% of the time for the duration of the event. Range of the value is 0 to 100. A value of 0xFF indicates the field							Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
				is not used." (from SEP2.0)							
7-Market / Program Enrollment	7	21	Effective Enrollment Date	Effective Start Date for the Enrollment	Market Enrollment is the collection of enrollment or tariff data for a Demand Resource to provide a specific market product or service.			Y			Y
2-Location	2	40	Electrical Node ID	Identifier assigned to the Electrical Node at which the Service Location is connected				Y			Y
2-Location	2	41	Electrical Node Name	Name of the Electrical Node at which the Service Location is connected				Y			Y
2-Location	2	42	Electrical Node Type	Type of Electrical Node at which the Service Location is attached				Y			Y
12-Event and Performance	12	24	Energy Baseline Timestamp	Timestamp of Energy Baseline				Y			Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	23	Energy Baseline Value	Calculated Energy Baseline	A Baseline is an estimate of the electricity that would have been consumed by a Demand Resource in the absence of a Demand Response Event. The Baseline is compared to the actual metered electricity consumption during the Demand Response Event to determine the Demand Modification Value. Depending on the type of Demand Response product or service, Baseline calculations may be performed in real time or after the fact.			Y			Y
9-Energy Market	9	13	Energy Schedule - Cleared MW Interval Value	The Energy Value of cleared MW for the Time Interval within the Energy Schedule	The offered energy MW that have cleared the market.			Y			
9-Energy Market	9	14	Energy Schedule - Cleared Price	Awarded Price	The market clearing price for the cleared energy MW.			Y			
9-Energy Market	9	11	Energy Schedule - End Time	End Time of the Energy Schedule	A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).			Y			
9-Energy Market	9	12	Energy Schedule - Interval Start Time	Start Time of the Energy Interval within the Energy Schedule	The start time of a specific energy schedule interval			Y			
9-Energy Market	9	10	Energy Schedule - Start Time	Start Time of the Energy Schedule	A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).			Y			Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	25	Enrollment End Date	Date of Termination of Enrollment				Y			Y
7-Market / Program Enrollment	7	22	Enrollment Status	Status of the Enrollment for the Facility or Resource	Examples: Pending Enrollment, Approved Enrollment, Under Review, Denied, Separated			Y			Y
12-Event and Performance	12	991	Event & Performance comments	Comments associated with Event and Performance data				Y			
13-Direct Load Control	13	14	Event Control	Event Control options for randomized start or end times: 1= Randomized Start time, 0=Randomized Start not Applied 1= Randomized End time, 0=Randomized End not Applied. (from SEP2.0)							Y
12-Event and Performance	12	12	Event Day	Operating Date of Start of Event				Y			Y
12-Event and Performance	12	13	Event Description	Description of the Event				Y			



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	18	Event End Time	Time of End of deployment period	Release/Recall is the notification, sent from the System Operator or Service Demand Response Provider to the Demand Resource, that the Deployment Period has ended or announcing the time that it will end.			Y			Y
12-Event and Performance	12	10	Event ID	Identifier assigned to the Event	An Event consists of the time periods, deadlines, and transitions during which Demand Resources perform. The System Operator <u>[Should this term be capitalized here and elsewhere in the REQ standard?]</u> shall specify the duration and applicability of a Demand Response Event. Some deadlines, time periods, and transitions may not be not applicable to all products or services.			Y			Y
12-Event and Performance	12	19	Event Modification Number	A modification number for the DR event. This is used to indicate if the DR Event has been modified by the Utility. Each time it is modified, this number is incremented.				Y			Y
12-Event and Performance	12	112	Event Modification Reason Code	The reason the event is being cancelled or modified.				Y			Y
12-Event and Performance	12	14	Event Start Time	Time of Start of deployment period for Event	The Deployment Period is the period of time from the Deployment to Release/Recall.			Y			Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	17	Event Status	Status of the Event	Examples include: initiated, completed, etc.			Y			Y
13-Direct Load Control	13	15	Exception Conditions	This is used to report that the load controller may not behave as commanded because of a variety of conditions including: • Faults in device • Customer override.							Y
5-Business Entity Relationships	5	991	External Entity Comments	Comments associated with the External Entity				Y			
3-Contact	3	21	First Name	First Name of the Contact				Y			
1-General Asset / Resource	1	41	GenBillingID	Billing Identifier assigned to the Resource				Y			
1-General Asset / Resource	1	40	GenEMSID	Alias or point Identifier assigned to the Resource				Y			
1-General Asset / Resource	1	991	General Resource Comments	General comments associated with the Resource				Y			
2-Location	2	20	GPS Coordinates	Latitude and longitude				Y			Y
4-Grid Connection	4	991	Grid Connection Comments	Comments associated with the Grid Connection of the Resource				Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
10-Ancillary Service Market	10	11	Have Engineering Diagram	Flag set if One-Line Diagrams have been submitted				Y			
14-Price and Product	14	13	Identifier Source (product)	The Identifier Source references the product identification scheme for the Product Identifier.		Y					
6-Device and Qualification	6	37	In-Service Date	Date the Distributed Generator became operational				Y			
6-Device and Qualification	6	36	Installation Date of Distributed Generator	Date of Installation of the Distributed Generator				Y			
9-Energy Market	9	0	Instruction ID		Unique identifier assigned to each instruction.			Y			
6-Device and Qualification	6	41	Interconnection Agreement Type	Type of Interconnection Agreement between the Distributed Generator or Service Location and the TDSP				Y			
6-Device and Qualification	6	42	Interconnection Limits	Limits associated with the Interconnection of the Distributed Generator or Service Location				Y			
3-Contact	3	22	Last Name	Last Name of the Contact				Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	30	Lead Time	Time between the advanced notification and deployment	Notification is the transmittal of a Deployment message.			Y			Y
13-Direct Load Control	13	16	Load Control State	The state of the load, which includes both commanded states and user settings. This may include a schedule of future states if a particular control algorithm for the load controller is being executed.							Y
12-Event and Performance	12	113	Load Level Value	Value of the load level to be achieved based on a set of enumerated values (e.g., moderate, high, etc.).							Y
6-Device and Qualification	6	52	Load Resource Control Device	Type of Control Device at a Service Location or deployed by a Response Method				Y			
5-Business Entity Relationships	5	30	Load Serving Entity ID	Identifier assigned to the LSE	The Load-Serving Entity serves end users and sells electric energy to end users.			Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	31	Load Serving Entity Name	Name of the LSE				Y			
2-Location	2	991	Location Comments	Comments associated with the Service Location				Y			
4-Grid Connection	4	10	Loss Factor Type	Type of Loss Factor				Y			
4-Grid Connection	4	11	Loss Factor Value	Loss Factor	Expressed as a decimal value.			Y			
6-Device and Qualification	6	35	Manufactured Date of Distributed Generator	Date of Manufacturer of the Distributed Generator				Y			Y
7-Market / Program Enrollment	7	12	Market	Type of wholesale market				Y			
8-Offer Parameters	8	40	Market Clearing Day	Market Clearing Day of the Offer				Y			
7-Market / Program Enrollment	7	991	Market Enrollment Comments	Comments associated with the Enrollment				Y			
7-Market / Program Enrollment	7	13	Market Product	Market Product	Product types include the following: energy, capacity, regulation, operating reserves (spinning or non-spin).			Y			Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	28	Maximum Error	Error of the Meter, including end-to-end Maximum Error				Y			
6-Device and Qualification	6	2293	Measurement Interval	Interval of time between Measurement readings	This is the time between electricity meter recordings. The Measurement records the consumption or supply of an End Device. An End Device is a physical end-use device that consumes or supplies electricity.			Y			
12-Event and Performance	12	32	Measurement Value (CIM)	Value of the interval reading				Y			Y
12-Event and Performance	12	31	Measurement Value Timestamp (CIM)	The time when the value was last updated				Y			Y
12-Event and Performance	12	34	Measurement Value Type	The type of measurement value.	The Measurement Value Type identifies the type of information provided in the Measurement Value. For example, the Measurement Value type could be energy (kWh/MWh) or demand (KW or MW).			Y			
6-Device and Qualification	6	26	Meter Accuracy Class	Accuracy Class of the Meter				Y			
6-Device and Qualification	6	2296	Meter Asset Comments	Comments associated with the Meter Asset				Y			



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Request Title: Master Data [Requirements Elements](#) List for Business Practice Standards associated with NIST PAP 03 and PAP 09

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	60	Meter Authority ID	Identifier assigned to the Metering Authority	The Metering Authority provides electric usage data necessary to determine the performance of a Resource.			Y			
5-Business Entity Relationships	5	61	Meter Authority Name	Name of the Metering Authority				Y			
6-Device and Qualification	6	10	Meter Configuration	Configuration of the Meter at the Facility	The CIM defines the ~~Meter~~ Meter as the physical asset that performs the metering role of the ServiceDeliveryPoint. It is used for measuring consumption and detecting events.			Y			
6-Device and Qualification	6	224	Meter Correction Factors	Device-specific Factors used to adjust for atmospheric changes at the point of installation of the Meter				Y			
6-Device and Qualification	6	227	Meter Device QA Plan	Quality Assurance plan for maintenance and testing of the Meter				Y			
6-Device and Qualification	6	20	Meter ID	Identifier assigned to the Meter				Y			
6-Device and Qualification	6	221	Meter Installation Date	Date of Installation of the Meter				Y			
5-Business Entity Relationships	5	50	Meter Installation Provider ID	Identifier assigned to the Meter Installation Provider				Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	51	Meter Installation Provider Name	Name of the Meter Installation Provider	This is the ~~competitive~~ meter entity for the meter device.			Y			
6-Device and Qualification	6	223	Meter Installer License	Professional License Number of the Installer of the Meter	[Are these Meter elements correctly checked Y for Wholesale but not for Retail?]			Y			
6-Device and Qualification	6	27	Meter Loss Compensation	Line Losses included in the Meter				Y			
6-Device and Qualification	6	22	Meter Manufacturer	Manufacturer of the Meter				Y			
6-Device and Qualification	6	23	Meter Model	Model of the Meter				Y			
6-Device and Qualification	6	25	Meter Multiplier (kH)	Multiplier used to convert pulses into power units				Y			
6-Device and Qualification	6	229 5	Meter Owner	Owner of the Meter				Y			
6-Device and Qualification	6	29	Meter Phase	Specific Phase information				Y			
6-Device and Qualification	6	229	Meter Qualification Date	Date of Qualification of the Meter by the Metering Authority or System Operator				Y			
6-Device and Qualification	6	24	Meter Rating	Load Rating of the Meter				Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	225	Meter Test Criteria	Test Criteria required to qualify the installation of the Meter				Y			
6-Device and Qualification	6	226	Meter Test Frequency	Frequency of Tests of the Meter	Expressed in months.			Y			
6-Device and Qualification	6	229 1	Meter Test Results	Results of Tests of the Meter	These are specific to the meter type.			Y			
6-Device and Qualification	6	21	Meter Type	Type of Meter installed at the Facility	Examples: RTU, CT/PT, etc.			Y			
8-Offer Parameters	8	21	Min Gen MW	Minimum MW available for dispatch	When required as part of an enrollment request, this value acts as a default.			Y			Y
8-Offer Parameters	8	22	MinGenCost	The cost per hour for each Min Gen MW value.	The cost per hour for each MinGenMW value.			Y			Y
11-Capacity Market	11	40	Minimum Payment Nomination	Strike price for the economic dispatch of the energy component of the capacity program	Expressed in Price/MW.			Y			
6-Device and Qualification	6	31	Nameplate Rating	Manufacturer's output rating of the Distributed Generator				Y			
0-Common Message Parameters	0	20	NERC CIP Security - Availability	CIP Security Classification for Availability				Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
0-Common Message Parameters	0	21	NERC CIP Security - Confidentiality	CIP Security Classification for Confidentiality				Y			
0-Common Message Parameters	0	22	NERC CIP Security - Integrity	CIP Security Classification for Integrity				Y			
2-Location	2	60	NERC Control Area	The NERC control area of the resource				Y			
11-Capacity Market	11	23	Nominal Capacity	Nominated load	Expressed as a decimal value.			Y			Y
6-Device and Qualification	6	44	Normal Breaker Status	Status of the Breaker for the Service Location under Normal operating conditions	Normal Operations is the time following Release/Recall during which a System Operator or Service Provider may require a Demand Resource to have returned its Load consumption to normal levels and to be available again for Deployment.			Y			
6-Device and Qualification	6	38	Normal Load Rating	Average load picked up by the Distributed Generator during the applicable performance hours				Y			
12-Event and Performance	12	111	Notification Acknowledgement	This is an acknowledgement of the receipt of a DR notification or dispatch. It should include any necessary provisions for non-repudiation.				Y			Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	38	Offer Commit Status	Commitment status of offer	Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc.			Y			Y
8-Offer Parameters	8	39	Offer Dispatch Status	Dispatch Status of Offer	Product-specific commitment status types included with offer. Examples include: economic, emergency, not participating, not qualified, and self-schedule. May also be used to temporarily opt out of DR Events and to override the normal operational constraints. The opt-out can be specified using the following criteria: • All events in a program indefinitely (unspecified time period) • Specific DR Event • All events in a specific time period. • Other triggered programs for which an asset or DR resource is already called upon (reduce double counting of available capacity)			Y			Y
8-Offer Parameters	8	30	Offer Dispatch Type	Type of Offer	Examples are Flexible (resource follows basepoint signals) or Fixed (resource requests DA commitment and RT schedules of 15 minutes or greater)			Y			
8-Offer Parameters	8	36	Offer Expiration Date	Date of Expiration of the Offer	This applies to DAM only.			Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	12	Offer Limit Interval	Offer Limit Interval	The period over which the offer limit applies, i.e., hour, day, etc.			Y			Y
8-Offer Parameters	8	11	Offer Limit Type	Type of Offer Limit	The limit may be associated with the bidding parameters of a resource. These may include limit types such as seasonal rating, reasonability, economic and ramp limits.			Y			Y
8-Offer Parameters	8	10	Offer Limit Value	Offer Limit Value	Expressed in MW or hours. Multiple Limit Types <u>are may be</u> applicable.			Y			Y
8-Offer Parameters	8	331	Offer Price Curve Slope	Flag to smooth offer segments from step function to slope				Y			
8-Offer Parameters	8	33	Offer Segment Hour	Hour of Segment of the Offer	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
8-Offer Parameters	8	31	Offer Segment MW	Energy of Segment of the Offer	The end value of the offer step, monotonically increasing, expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)			Y			
8-Offer Parameters	8	32	Offer Segment Price	Price of Segment of the Offer	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
12-Event and Performance	12	15	Operator Comment	Additional Event information provided by the Operator				Y			
9-Energy Market	9	23	Output MVAR	Reactive Power Output of the Distributed Generator	Expressed in Mvar			Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	22	Output MW	Real Power Output of the Distributed Generator	Expressed in MW			Y			
14-Price and Product	14	30	Override Unit of Measure	Optional Attribute of Price object If this is used, then Unit of Measure is not applicable		Y					
6-Device and Qualification	6	11	Parent Meter id	Flag set if the Meter is a Master or Parent Meter				Y			
11-Capacity Market	11	22	Peak Date/Time	Date and Time of measurement of Peak				Y			
11-Capacity Market	11	21	Peak Type	Type of measurement of Peak	Examples are: Annual, Monthly, Weekly, and Seasonal.			Y			
11-Capacity Market	11	20	Peak Value	Measurement of Peak				Y			
7-Market / Program Enrollment	7	51	Performance Evaluation Method	Method used to Evaluate the Performance of a Resource	Based on NAESB M&V terms.			Y			
7-Market / Program Enrollment	7	50	Performance Evaluation Method Type Code	Code representing the Type of Measurement				Y			
8-Offer Parameters	8	20	Physical Min Gen	Minimum Operating Level of a Resource				Y			Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	43	PNode	Name of the Price Node associated with the Service Location	The P-Node is the price location of the Service Location in the transmission and/or distribution network.			Y			Y
2-Location	2	44	PNode ID	Identifier assigned to the Price Node associated with the Service Location				Y			Y
8-Offer Parameters	8	50	Portfolio Name	Name of an aggregation of Resources for market participation				Y			
14-Price and Product	14	33	Price Component Type	The portion of the price to which the corresponding value applies.	Examples: Energy, congestion, losses	Y					
14-Price and Product	14	34	Price Component Value	The value of the price component.		Y					
14-Price and Product	14	35	Price Location	The location at which the price is applicable.		Y					
14-Price and Product	14	36	Price Type	Time characteristic of the price	The type of price (day-ahead, real-time, etc.).	Y					
6-Device and Qualification	6	47	Private Use Network	Flag set if the Resource is an Electric Network connected to the transmission grid	This is used for load that is typically netted with internal generation.			Y			
14-Price and Product	14	20	Product Identifier	Identifies specific product associated with the price		Y			Y		



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
14-Price and Product	14	10	Product Name	Same as 7.13 Market Product	An identifier for a particular electricity product offering: energy, capacity, ancillary services, etc.	Y					
14-Price and Product	14	31	Product Price	The sum of all Price Component Values for a given product (Total Price).		Y					Y
14-Price and Product	14	32	Product Price Factor	Terms of use attribute of Product Price	Examples: Price_absolute, Price_relative, Price_multiplier	Y			Y		
14-Price and Product	14	12	Product Sub-type	Used to further define product types		Y			Y		
14-Price and Product	14	11	Product Type	Defines the source and product	Classifications used within industry for trading energy. Examples: PJM Energy, NYISO 10-min Spin, etc.	Y					Y
7-Market / Program Enrollment	7	10	Program ID	Program Identifier	The identifier of the program			Y			Y
7-Market / Program Enrollment	7	11	Program Name	Name of the Program				Y			Y
6-Device and Qualification	6	222	PT Ratio	Ratio of the Potential Transformer				Y			
11-Capacity Market	11	24	Qualified Capacity	Nominal ICAP derated for performance	Derated based on past performance.			Y			Y
8-Offer Parameters	8	25	Ramp Rate Direction	Direction of the selected Ramp Rate Type and Ramp Rate Segment	Valid directions are: Upward, Downward, Both.			Y			Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	24	Ramp Rate Segment	Energy of Segment of the Ramp Rate	The end value of the Ramp Rate step, monotonically increasing or decreasing (as indicated by the Ramp Rate Direction), expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)			Y			Y
8-Offer Parameters	8	23	Ramp Rate Type	Type of Ramp Rate	Examples are: Normal, Emergency, Regulation.			Y			Y
8-Offer Parameters	8	26	Ramp Rate Value	Ramp Rate associated with the selected Ramp Rate Type for the selected Ramp Rate Segment and Ramp Rate Direction	The NERC definition of Ramp Rate is the rate, expressed in megawatts per minute, by which a generator changes its output. For a Demand Resource, the Ramp Rate is the rate, expressed in megawatts per minute, by which a Demand Resource changes its Load.			Y			Y
7-Market / Program Enrollment	7	32	Real Time Flag	Flag set if the Resource will be participating in the Real-Time market				Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
10-Ancillary Service Market	10	32	Regulation Base Point	Per-interval Regulation dispatch instruction	Regulation Service is a type of Demand Response service in which a Demand Resource corrects for short-term changes in electricity use that might affect the stability of the power system, matching generation and load to maintain a desired frequency. Demand Resources providing Regulation Service are subject to dispatch continuously during a commitment period. Provision of Regulation Service does not correlate to Demand Response deployment terms of the Event timelines, deadlines and durations.			Y			
0-Common Message Parameters	0	13	Rejection Code Type	Type of rejection message	Rejection code type is categorizing the different kinds of rejection messages associated with enrollment, qualification, offers or meter data. May be combined with comments to provide details beyond the type of rejection.			Y			
0-Common Message Parameters	0	14	Rejection Code Value	Code referring to the reason for a rejection message	Rejection code related to the type of rejection. May be combined with comments to provide details beyond the type of rejection.			Y			
12-Event and Performance	12	30	Reporting Interval	Interval size required for Reporting				Y			Y
10-Ancillary Service Market	10	24	Requalification Requirement	Flag set if Requalification is Required				Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	26	Requalification Test Date	Date the Resource will retest its ability to deliver a product or service				Y			Y
10-Ancillary Service Market	10	31	Reserve Pickup Flag	Flag set if this is a Reserve Pickup schedule	Reserve Service is a type of Demand Response service in which Demand Resources are obligated to be available to provide Demand reduction Energy Service, based on reserve capacity requirements that are established to meet applicable reliability standards. Reserve Services are defined by short-term response rates (Ramp Period) and synchronization with the electricity grid (i.e., spinning and non-spinning reserves).			Y			
1-General Asset / Resource	1	20	Resource ID	Identifier assigned to the Resource	A Resource may be an individual asset or a group of assets that represent a dispatchable entity.			Y			Y
1-General Asset / Resource	1	21	Resource Name	Name of the Resource				Y			
7-Market / Program Enrollment	7	24	Resource Qualification Test Date	Date the Resource demonstrated its ability to deliver a product or service				Y			Y
7-Market / Program Enrollment	7	23	Resource Type	Type of Resource	Examples are: load reduction (curtailable or interruptible load), distributed generation, combination, renewable, storage, etc.			Y			Y
7-Market / Program	7	41	Response Method ID	Identifier assigned to the Response Method				Y			



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data [Requirements-Elements](#) List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
Enrollment											
7-Market / Program Enrollment	7	42	Response Method Name	Name of the Response Method				Y			
7-Market / Program Enrollment	7	40	Response Method Type	Type of Response Method	Expressed as a response type code			Y			
7-Market / Program Enrollment	7	43	Response Method Value	Value of the Response Method	The Demand Response Value is the quantity of modified electrical consumption by a Demand Resource, expressed as MW.			Y			
7-Market / Program Enrollment	7	34	Response Time	The amount of time before an asset/resource is capable of meeting its full performance, in response to a request by a Service Provider to shed load.							Y
12-Event and Performance	12	33	Response Value	Response				Y			Y
5-Business Entity Relationships	5	44	Retail Rate	Retail Rate	Expressed as Price per kWh *[Why are these retail items (40-44) checked Y for wholesale and unchecked for retail?]			Y			
5-Business Entity Relationships	5	41	Retail Rate Code	Code representing the Retail Rate for the Service Location	*			Y			



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
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Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data [Requirements Elements](#) List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	43	Retail Rate Description	Description of the Retail Rate	*This can also be used for comments associated with the Retail Rate.			Y			
5-Business Entity Relationships	5	40	Retail Rate ID	Identifier assigned to the Retail Rate	*			Y			
5-Business Entity Relationships	5	42	Retail Rate Name	Name of the Retail Rate for the Service Location	*			Y			
8-Offer Parameters	8	42	Schedule Description	Description of the Offer				Y			
9-Energy Market	9	15	Schedule ID		Unique identifier assigned to each schedule.			Y			
8-Offer Parameters	8	41	Schedule Name	Name or tag of the Offer				Y			
8-Offer Parameters	8	43	Schedule Status	Status of the Offer				Y			
5-Business Entity Relationships	5	70	Scheduling Entity ID	Identifier assigned to the Scheduling Entity	A Scheduling Entity submits bids and/or offers and receives Schedules and Awards.			Y			
5-Business Entity Relationships	5	71	Scheduling Entity Name	Name of the Scheduling Entity				Y			



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data **Requirements Elements** List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	33	Self-Schedule Flag	Flag set if the Resource is Self-Deploying	Self-Deployment is the Deployment via established Communication Methods initiated by the Service Provider [Is this a defined term for WEQ and REQ?] or the Resource.			Y			
1-General Asset / Resource	1	10	Service Location ID	Identifier assigned to the Service Location	The location at which connection to the transmission or distribution system is made.			Y			Y
1-General Asset / Resource	1	11	Service Location Name	Name of the Service Location				Y			
5-Business Entity Relationships	5	11	Service Provider ID	Identifier assigned to the Service Provider	The Service Provider coordinates Resources to deliver electricity products and services to a market or distribution operator.			Y			Y
5-Business Entity Relationships	5	12	Service Provider Name	Name of the Service Provider				Y			
9-Energy Market	9	25	Set Point	Final dispatch target level	The real-time desired MW output signal calculated for a specific Resource by the Transmission Provider's control system on a specified periodicity that is equal to the current Energy Dispatch Target plus the Regulating Reserve Deployment instruction (which may be positive or negative) plus an adjustment to the Energy Dispatch Target to account for Contingency Reserve Deployment Instructions. The Setpoint Instruction represents the desired output level of the Resource.			Y			



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements-Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	50	Simple Signal Levels	Used as an alternate and simplified representation of the DR signal, whether it be price based or a dispatch. Takes on a small number of finite levels such as NORMAL, MODERATE, and HIGH, SPECIAL							Y
14-Price and Product	14	40	Source Location Identifier	The identifier of the source location of the product for which the price applies		Y			Y		
14-Price and Product	14	41	Source Location Identifier Type	The type of source location of the product for which the price applies		Y					
8-Offer Parameters	8	34	Startup Cost	Cost of starting a response activity	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
8-Offer Parameters	8	37	Startup Cost Type	Type of startup cost	The type of Start Up Cost included in the offer. Options may include: Select cold, intermediate, hot or shutdown.			Y			
2-Location	2	13	State/Province	State or Province two-letter code				Y			Y



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Request Title: Master Data Requirements Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
13-Direct Load Control	13	10	Status Check	A signal to require the DR resource status to be sent back. (Only applicable to Direct Load Control)							Y
8-Offer Parameters	8	35	Strike Price	Threshold Price	Expressed as a decimal value of price/MW.			Y			
8-Offer Parameters	8	332	Strike Price Type	Type of strike price	Indicates the type of strike price. Options may include: buy or sell.			Y			
0-Common Message Parameters	0	10	Submittal Date	Timestamp for the sender's use				Y			
0-Common Message Parameters	0	11	Submitted By	User ID of submitter	Common data element to indicate the user ID of the entity submitting the data			Y			
0-Common Message Parameters	0	12	Submitted Error	ID of submission error detected	Common data element to capture any errors or exceptions during submission			Y			
10-Ancillary Service Market	10	21	Synchronization Test Date	Target Date of Test of Synchronization to the grid				Y			
3-Contact	3	13	Third Party	Flag set if the Contact is a third-party entity				Y			
2-Location	2	22	Time Zone Name	Name of the Time Zone in which the Service Location is located				Y			



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Request Title: Master Data **Requirements-Elements** List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
3-Contact	3	20	Title	Title of the Contact				Y			
5-Business Entity Relationships	5	22	Transmission / Distribution Service Provider Account Number	Transmission / Distribution Service Provider's account number for the Resource				Y			Y
5-Business Entity Relationships	5	20	Transmission / Distribution Service Provider ID	Identifier assigned to the Transmission / Distribution Service Provider	The Transmission / Distribution Service Provider operates a local electricity transmission and/or distribution system.			Y			
5-Business Entity Relationships	5	21	Transmission / Distribution Service Provider Name	Name of the Transmission / Distribution Service Provider				Y			
6-Device and Qualification	6	51	UFR Settings	Setting of the Under-Frequency Relay				Y			
14-Price and Product	14	14	Unit of Measure	Attribute of Product Identifier		Y					Y
12-Event and Performance	12	52	Usage Information	Information about the near real time electricity usage of the DR Resource.							Y



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Request Title: Master Data Requirements Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	2292	VEE Compliance	Compliance standard for Validation, Editing, and Estimation	Validation, Editing, and Estimation is the process of taking raw meter data and performing validation and, as necessary, editing and estimation of corrupt or missing data, to create validated data. VEE guidelines are published in the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering, Volume Two, Published 12/05/00, http://www.naesb.org/REQ/req_form.asp .			Y			
7-Market / Program Enrollment	7	44	Verified Capability	Audited Capability	Auditing is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods AFTER the Enrollment process.			Y			
7-Market / Program Enrollment	7	45	Verified Capability Factor	Ratio of the Verified Capability to the qualified capability	Qualification is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods DURING the Enrollment process.			Y			
2-Location	2	21	Weather Station	Weather Station code associated with the Service Location				Y			Y
6-Device and Qualification	6	46	Wholesale Delivery Point Status	Flag set if the Service Location is metered at the Wholesale level				Y			
2-Location	2	14	Zip/Postal Code	Zip or Postal Code				Y			Y
2-Location	2	31	Zone	Name of the Zone in which the Service Location is	A Zone is a physical or electrical region.			Y			Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
				located							
2-Location	2	30	Zone ID	Identifier assigned to the Zone in which the Service Location is located				Y			Y
2-Location	2	32	Zone Type	Type of Zone	Examples: Capacity, Dispatch, Price, Load, etc.			Y			



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Request Title: Master Data [Requirements-Elements](#) List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Listing by Category ID and Category Element ID

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
0-Common Message Parameters	0	10	Submittal Date	Timestamp for the sender's use				Y			
0-Common Message Parameters	0	11	Submitted By	User ID of submitter	Common data element to indicate the user ID of the entity submitting the data			Y			
0-Common Message Parameters	0	12	Submitted Error	ID of submission error detected	Common data element to capture any errors or exceptions during submission			Y			
0-Common Message Parameters	0	13	Rejection Code Type	Type of rejection message	Rejection code type is categorizing the different kinds of rejection messages associated with enrollment, qualification, offers or meter data. May be combined with comments to provide details beyond the type of rejection.			Y			
0-Common Message Parameters	0	14	Rejection Code Value	Code referring to the reason for a rejection message	Rejection code related to the type of rejection. May be combined with comments to provide details beyond the type of rejection.			Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
0-Common Message Parameters	0	20	NERC CIP Security - Availability	CIP Security Classification for Availability				Y			
0-Common Message Parameters	0	21	NERC CIP Security - Confidentiality	CIP Security Classification for Confidentiality				Y			
0-Common Message Parameters	0	22	NERC CIP Security - Integrity	CIP Security Classification for Integrity				Y			
1-General Asset / Resource	1	10	Service Location ID	Identifier assigned to the Service Location	The location at which connection to the transmission or distribution system is made.			Y			Y
1-General Asset / Resource	1	11	Service Location Name	Name of the Service Location				Y			
1-General Asset / Resource	1	12	Asset ID	The unique identifier of the asset				Y			Y
1-General Asset / Resource	1	13	Asset Name	The name of the asset				Y			
1-General Asset / Resource	1	20	Resource ID	Identifier assigned to the Resource	A Resource may be an individual asset or a group of assets that represent a dispatchable entity.			Y			Y
1-General Asset / Resource	1	21	Resource Name	Name of the Resource				Y			



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Request Title: Master Data Requirements Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
1-General Asset / Resource	1	22	DR Resource Group ID	Grouping of Resources that can respond to the same DR signal							Y
1-General Asset / Resource	1	30	Asset Group ID	The identifier of a group of assets	An Asset Group is a logical entity that has a reportable interval-level consumption.			Y			Y
1-General Asset / Resource	1	31	Asset Group Name	Name of the aggregated group of assets				Y			Y
1-General Asset / Resource	1	40	GenEMSID	Alias or point Identifier assigned to the Resource				Y			
1-General Asset / Resource	1	41	GenBillingID	Billing Identifier assigned to the Resource				Y			
1-General Asset / Resource	1	50	Business Segment	SIC or NAICS code of the Service Location				Y			
1-General Asset / Resource	1	51	Batch Load Flag	Flag set if the Resource is a Batch Load				Y			
1-General Asset / Resource	1	991	General Resource Comments	General comments associated with the Resource				Y			
2-Location	2	10	Address1	Address line 1				Y			Y
2-Location	2	11	Address2	Address line 2				Y			Y
2-Location	2	12	City	City				Y			Y
2-Location	2	13	State/Province	State or Province two-letter code				Y			Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	14	Zip/Postal Code	Zip or Postal Code				Y			Y
2-Location	2	15	Country	Country				Y			Y
2-Location	2	20	GPS Coordinates	Latitude and longitude				Y			Y
2-Location	2	21	Weather Station	Weather Station code associated with the Service Location				Y			Y
2-Location	2	22	Time Zone Name	Name of the Time Zone in which the Service Location is located				Y			
2-Location	2	30	Zone ID	Identifier assigned to the Zone in which the Service Location is located				Y			Y
2-Location	2	31	Zone	Name of the Zone in which the Service Location is located	A Zone is a physical or electrical region.			Y			Y
2-Location	2	32	Zone Type	Type of Zone	Examples: Capacity, Dispatch, Price, Load, etc.			Y			
2-Location	2	40	Electrical Node ID	Identifier assigned to the Electrical Node at which the Service Location is connected				Y			Y
2-Location	2	41	Electrical Node Name	Name of the Electrical Node at which the Service Location is connected				Y			Y



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Request Title: Master Data Requirements-Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	42	Electrical Node Type	Type of Electrical Node at which the Service Location is attached				Y			Y
2-Location	2	43	PNode	Name of the Price Node associated with the Service Location	The P-Node is the price location of the Service Location in the transmission and/or distribution network.			Y			Y
2-Location	2	44	PNode ID	Identifier assigned to the Price Node associated with the Service Location				Y			Y
2-Location	2	50	Competitive Choice Area	Flag set if the Service Location is in an area with Competitive Choice				Y			
2-Location	2	51	Asset Multiplier	Number of identical Assets within the Service Location				Y			
2-Location	2	60	NERC Control Area	The NERC control area of the resource				Y			
2-Location	2	71	Connection Type	Additional type of connection associated with the Service Delivery Point	Example: ICCP Connection, IP address			Y			
2-Location	2	72	Connection Address	Address associated with the Connection Type	Example: Address of ICCP Connection, IP address			Y			
2-Location	2	991	Location Comments	Comments associated with the Service Location				Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
3-Contact	3	10	Contact Type	Interest code associated with a Contact	This is a classification defining the function a particular contact serves. It supports "who to call for what needs" decisions. Examples are: Primary, Secondary, Billing, Third Party, and Authorized Representative.			Y			
3-Contact	3	11	Contact Priority	Order in which this Contact should be selected	This is used when multiple contacts are defined.			Y			
3-Contact	3	12	DUNS Number	DUNS business number				Y			
3-Contact	3	13	Third Party	Flag set if the Contact is a third-party entity				Y			
3-Contact	3	20	Title	Title of the Contact				Y			
3-Contact	3	21	First Name	First Name of the Contact				Y			
3-Contact	3	22	Last Name	Last Name of the Contact				Y			
3-Contact	3	23	Contact Middle Name	Middle Name of the Contact				Y			
3-Contact	3	30	Contact Method	Method of communication with the Contact	This identifies the various types of communication options (phone, email, etc.) <u>to which may</u> be used.			Y			
3-Contact	3	31	Contact Address Data	Method-dependent Address of the Contact	This identifies specific information required for the contact method selected.			Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
3-Contact	3	32	Contact Method Priority	Order in which a Communication Method should be selected for a Contact	A Communication Method is the medium by which an object communicates with another object for instruction, measurement, or control. The user specifies the sequence in which each medium is to be used when being contacted.			Y			
3-Contact	3	991	Contact Comments	Comments associated with the Contact				Y			
4-Grid Connection	4	10	Loss Factor Type	Type of Loss Factor				Y			
4-Grid Connection	4	11	Loss Factor Value	Loss Factor	Expressed as a decimal value.			Y			
4-Grid Connection	4	12	Connect Voltage	Voltage level	Voltage at connection.			Y			
4-Grid Connection	4	991	Grid Connection Comments	Comments associated with the Grid Connection of the Resource				Y			
5-Business Entity Relationships	5	11	Service Provider ID	Identifier assigned to the Service Provider	The Service Provider coordinates Resources to deliver electricity products and services to a market or distribution operator.			Y			Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	12	Service Provider Name	Name of the Service Provider				Y			
5-Business Entity Relationships	5	13	Demand Response Provider		The entity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response products.						Y
5-Business Entity Relationships	5	14	Demand Response Controlling Entity		An identifier for the Service Provider issuing the DR event deployment instructions.						Y
5-Business Entity Relationships	5	20	Transmission / Distribution Service Provider ID	Identifier assigned to the Transmission / Distribution Service Provider	The Transmission / Distribution Service Provider operates a local electricity transmission and/or distribution system.			Y			
5-Business Entity Relationships	5	21	Transmission / Distribution Service Provider Name	Name of the Transmission / Distribution Service Provider				Y			
5-Business Entity Relationships	5	22	Transmission / Distribution Service Provider Account Number	Transmission / Distribution Service Provider's account number for the Resource				Y			Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	30	Load Serving Entity ID	Identifier assigned to the LSE	The Load-Serving Entity serves end users and sells electric energy to end users.			Y			
5-Business Entity Relationships	5	31	Load Serving Entity Name	Name of the LSE				Y			
5-Business Entity Relationships	5	40	Retail Rate ID	Identifier assigned to the Retail Rate	*[Why are these retail items (40-44) checked Y for wholesale and unchecked for retail?]			Y			
5-Business Entity Relationships	5	41	Retail Rate Code	Code representing the Retail Rate for the Service Location	*			Y			
5-Business Entity Relationships	5	42	Retail Rate Name	Name of the Retail Rate for the Service Location	*			Y			
5-Business Entity Relationships	5	43	Retail Rate Description	Description of the Retail Rate	* This can also be used for comments associated with the Retail Rate.			Y			
5-Business Entity Relationships	5	44	Retail Rate	Retail Rate	* Expressed as Price per kWh			Y			
5-Business Entity Relationships	5	50	Meter Installation Provider ID	Identifier assigned to the Meter Installation Provider				Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	51	Meter Installation Provider Name	Name of the Meter Installation Provider	This is the ~~competitive~~ meter entity for the meter device.			Y			
5-Business Entity Relationships	5	60	Meter Authority ID	Identifier assigned to the Metering Authority	The Metering Authority provides electric usage data necessary to determine the performance of a Resource.			Y			
5-Business Entity Relationships	5	61	Meter Authority Name	Name of the Metering Authority				Y			
5-Business Entity Relationships	5	70	Scheduling Entity ID	Identifier assigned to the Scheduling Entity	A Scheduling Entity submits bids and/or offers and receives Schedules and Awards.			Y			
5-Business Entity Relationships	5	71	Scheduling Entity Name	Name of the Scheduling Entity				Y			
5-Business Entity Relationships	5	80	Designated Dispatch Entity ID	Identifier assigned to the Designated Dispatch Entity	The Designated Dispatch Entity receives and processes Demand Resource Dispatch instructions or market information and may provide response information.			Y			
5-Business Entity Relationships	5	81	Designated Dispatch Entity Name	Name of the Designated Dispatch Entity				Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	90	Asset Operator ID	The identifier of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.							Y
5-Business Entity Relationships	5	91	Asset Operator Name	The name of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.							Y
5-Business Entity Relationships	5	92	Asset Owner ID	The Identifier of the business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).							Y
5-Business Entity Relationships	5	93	Asset Owner Name	The Name of business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).							Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	991	External Entity Comments	Comments associated with the External Entity				Y			
6-Device and Qualification	6	10	Meter Configuration	Configuration of the Meter at the Facility	The CIM defines the Meter as the physical asset that performs the metering role of the ServiceDeliveryPoint. It is used for measuring consumption and detecting events.			Y			
6-Device and Qualification	6	11	Parent Meter id	Flag set if the Meter is a Master or Parent Meter				Y			
6-Device and Qualification	6	20	Meter ID	Identifier assigned to the Meter				Y			
6-Device and Qualification	6	21	Meter Type	Type of Meter installed at the Facility	Examples: RTU, CT/PT, etc.			Y			
6-Device and Qualification	6	22	Meter Manufacturer	Manufacturer of the Meter				Y			
6-Device and Qualification	6	221	Meter Installation Date	Date of Installation of the Meter				Y			
6-Device and Qualification	6	222	PT Ratio	Ratio of the Potential Transformer				Y			



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements-Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	223	Meter Installer License	Professional License Number of the Installer of the Meter	[Are these Meter elements correctly checked Y for Wholesale but not for Retail?]			Y			
6-Device and Qualification	6	224	Meter Correction Factors	Device-specific Factors used to adjust for atmospheric changes at the point of installation of the Meter				Y			
6-Device and Qualification	6	225	Meter Test Criteria	Test Criteria required to qualify the installation of the Meter				Y			
6-Device and Qualification	6	226	Meter Test Frequency	Frequency of Tests of the Meter	Expressed in months.			Y			
6-Device and Qualification	6	227	Meter Device QA Plan	Quality Assurance plan for maintenance and testing of the Meter				Y			
6-Device and Qualification	6	228	Date of Last Meter Test	Date of Last Test of the Meter				Y			
6-Device and Qualification	6	229	Meter Qualification Date	Date of Qualification of the Meter by the Metering Authority or System Operator				Y			
6-Device and Qualification	6	229 1	Meter Test Results	Results of Tests of the Meter	These are specific to the meter type.			Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	229 2	VEE Compliance	Compliance standard for Validation, Editing, and Estimation	Validation, Editing, and Estimation is the process of taking raw meter data and performing validation and, as necessary, editing and estimation of corrupt or missing data, to create validated data. VEE guidelines are published in the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering, Volume Two, Published 12/05/00, http://www.naesb.org/REQ/req_form.asp .			Y			
6-Device and Qualification	6	229 3	Measurement Interval	Interval of time between Measurement readings	This is the time between electricity meter recordings. The Measurement records the consumption or supply of an End Device. An End Device is a physical end-use device that consumes or supplies electricity.			Y			
6-Device and Qualification	6	229 4	ANSI Compliance	ANSI standard with which the Meter complies				Y			
6-Device and Qualification	6	229 5	Meter Owner	Owner of the Meter				Y			
6-Device and Qualification	6	229 6	Meter Asset Comments	Comments associated with the Meter Asset				Y			
6-Device and Qualification	6	23	Meter Model	Model of the Meter				Y			
6-Device and Qualification	6	24	Meter Rating	Load Rating of the Meter				Y			



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Request Title: Master Data Requirements-Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	25	Meter Multiplier (kH)	Multiplier used to convert pulses into power units				Y			
6-Device and Qualification	6	26	Meter Accuracy Class	Accuracy Class of the Meter				Y			
6-Device and Qualification	6	27	Meter Loss Compensation	Line Losses included in the Meter				Y			
6-Device and Qualification	6	28	Maximum Error	Error of the Meter, including end-to-end Maximum Error				Y			
6-Device and Qualification	6	29	Meter Phase	Specific Phase information				Y			
6-Device and Qualification	6	291	CT Ratio	Ratio of the Current Transformer				Y			
6-Device and Qualification	6	30	Distributed Generator Type	Type of Distributed Generator	This technology characteristic of the Distributed Generator, such as combined cycle, induction, etc.			Y			
6-Device and Qualification	6	31	Nameplate Rating	Manufacturer's output rating of the Distributed Generator				Y			
6-Device and Qualification	6	32	Distributed Generator Fuel Type	Type of Fuel consumed by the Distributed Generator				Y			



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Request Title: Master Data Requirements-Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	33	Distributed Generator Permit Type	Type of environmental authorization required to operate the Distributed Generator	The Environmental Authority is a regulatory authority responsible for the development, reporting, and enforcement of environmental activities.			Y			
6-Device and Qualification	6	34	Distributed Generator Manufacturer	Manufacturer of the Distributed Generator				Y			Y
6-Device and Qualification	6	35	Manufactured Date of Distributed Generator	Date of Manufacturer of the Distributed Generator				Y			Y
6-Device and Qualification	6	36	Installation Date of Distributed Generator	Date of Installation of the Distributed Generator				Y			
6-Device and Qualification	6	37	In-Service Date	Date the Distributed Generator became operational				Y			
6-Device and Qualification	6	38	Normal Load Rating	Average load picked up by the Distributed Generator during the applicable performance hours				Y			
6-Device and Qualification	6	39	Distributed Generator Name	Name of the Distributed Generator				Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	41	Interconnection Agreement Type	Type of Interconnection Agreement between the Distributed Generator or Service Location and the TDSP				Y			
6-Device and Qualification	6	42	Interconnection Limits	Limits associated with the Interconnection of the Distributed Generator or Service Location				Y			
6-Device and Qualification	6	43	Capable of Synchronizing to Grid	Flag set if the Service Location is capable of Synchronizing to the Grid				Y			
6-Device and Qualification	6	44	Normal Breaker Status	Status of the Breaker for the Service Location under Normal operating conditions	Normal Operations is the time following Release/Recall during which a System Operator or Service Provider may require a Demand Resource to have returned its Load consumption to normal levels and to be available again for Deployment.			Y			
6-Device and Qualification	6	45	Breaker Status During Event	Status of the Breaker for the Service Location during an Emergency Event				Y			
6-Device and Qualification	6	46	Wholesale Delivery Point Status	Flag set if the Service Location is metered at the Wholesale level				Y			



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Request Title: Master Data **Requirements Elements** List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	47	Private Use Network	Flag set if the Resource is an Electric Network connected to the transmission grid	This is used for load that is typically netted with internal generation.			Y			
6-Device and Qualification	6	51	UFR Settings	Setting of the Under-Frequency Relay				Y			
6-Device and Qualification	6	52	Load Resource Control Device	Type of Control Device at a Service Location or deployed by a Response Method				Y			
6-Device and Qualification	6	70	Device Class		Note: From SEP2.0 Enumeration representing the Device Class to apply the current Load Control Event. 0 HVAC compressor or furnace 1 Strip Heaters/Baseboard Heaters 2 Water Heater 3 Pool Pump/Spa/Jacuzzi 4 Smart Appliances 5 Irrigation Pump 6 Managed Commercial & Industrial (C&I) loads 7 Simple misc. (Residential On/Off) loads 8 Exterior Lighting 9 Interior Lighting 10 Electric Vehicle 11 Generation Systems 12 to 15 Reserved						Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	80	Asset Manufacturer	Manufacturer of the Asset							Y
6-Device and Qualification	6	81	Asset Model	Model identifier of the Asset, assigned by the Manufacturer							Y
6-Device and Qualification	6	82	Asset Version	Model version identifier, assigned by the Manufacturer							Y
6-Device and Qualification	6	83	Asset Manufacture Date	Date of Manufacture of the Asset							Y
6-Device and Qualification	6	84	Asset Type	Type of Asset	Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.						Y
6-Device and Qualification	6	991	Distributed Generator Comments	Comments associated with the Distributed Generator				Y			
7-Market / Program Enrollment	7	10	Program ID	Program Identifier	The identifier of the program			Y			Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	11	Program Name	Name of the Program				Y			Y
7-Market / Program Enrollment	7	12	Market	Type of wholesale market				Y			
7-Market / Program Enrollment	7	13	Market Product	Market Product	Product types include the following: energy, capacity, regulation, operating reserves (spinning or non-spin).			Y			Y
7-Market / Program Enrollment	7	21	Effective Enrollment Date	Effective Start Date for the Enrollment	Market Enrollment is the collection of enrollment or tariff data for a Demand Resource to provide a specific market product or service.			Y			Y
7-Market / Program Enrollment	7	22	Enrollment Status	Status of the Enrollment for the Facility or Resource	Examples: Pending Enrollment, Approved Enrollment, Under Review, Denied, Separated			Y			Y
7-Market / Program Enrollment	7	23	Resource Type	Type of Resource	Examples are: load reduction (curtailable or interruptible load), distributed generation, combination, renewable, storage, etc.			Y			Y
7-Market / Program Enrollment	7	24	Resource Qualification Test Date	Date the Resource demonstrated its ability to deliver a product or service				Y			Y
7-Market / Program Enrollment	7	25	Enrollment End Date	Date of Termination of Enrollment				Y			Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	26	Requalification Test Date	Date the Resource will retest its ability to deliver a product or service				Y			Y
7-Market / Program Enrollment	7	30	Lead Time	Time between the advanced notification and deployment	Notification is the transmittal of a Deployment message.			Y			Y
7-Market / Program Enrollment	7	31	Day Ahead Flag	Flag set if the Resource will be participating in the Day-Ahead market				Y			
7-Market / Program Enrollment	7	32	Real Time Flag	Flag set if the Resource will be participating in the Real-Time market				Y			
7-Market / Program Enrollment	7	33	Self-Schedule Flag	Flag set if the Resource is Self-Deploying	Self-Deployment is the Deployment via established Communication Methods initiated by the Service Provider [Is this a defined term for WEQ and REQ?] or the Resource.			Y			
7-Market / Program Enrollment	7	34	Response Time	The amount of time before an asset/resource is capable of meeting its full performance, in response to a request by a Service Provider to shed load.							Y
7-Market / Program Enrollment	7	40	Response Method Type	Type of Response Method	Expressed as a response type code			Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	41	Response Method ID	Identifier assigned to the Response Method				Y			
7-Market / Program Enrollment	7	42	Response Method Name	Name of the Response Method				Y			
7-Market / Program Enrollment	7	43	Response Method Value	Value of the Response Method	The Demand Response Value is the quantity of modified electrical consumption by a Demand Resource, expressed as MW.			Y			
7-Market / Program Enrollment	7	44	Verified Capability	Audited Capability	Auditing is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods AFTER the Enrollment process.			Y			
7-Market / Program Enrollment	7	45	Verified Capability Factor	Ratio of the Verified Capability to the qualified capability	Qualification is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods DURING the Enrollment process.			Y			
7-Market / Program Enrollment	7	50	Performance Evaluation Method Type Code	Code representing the Type of Measurement				Y			
7-Market / Program Enrollment	7	51	Performance Evaluation Method	Method used to Evaluate the Performance of a Resource	Based on NAESB M&V terms.			Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	991	Market Enrollment Comments	Comments associated with the Enrollment				Y			
8-Offer Parameters	8	10	Offer Limit Value	Offer Limit Value	Expressed in MW or hours. Multiple Limit Types <u>are may be</u> applicable.			Y			Y
8-Offer Parameters	8	11	Offer Limit Type	Type of Offer Limit	The limit may be associated with the bidding parameters of a resource. These may include limit types such as seasonal rating, reasonability, economic and ramp limits.			Y			Y
8-Offer Parameters	8	12	Offer Limit Interval	Offer Limit Interval	The period over which the offer limit applies, i.e., hour, day, etc.			Y			Y
8-Offer Parameters	8	20	Physical Min Gen	Minimum Operating Level of a Resource				Y			Y
8-Offer Parameters	8	21	Min Gen MW	Minimum MW available for dispatch	When required as part of an enrollment request, this value acts as a default.			Y			Y
8-Offer Parameters	8	22	MinGenCost	The cost per hour for each Min Gen MW value.	The cost per hour for each MinGenMW value.			Y			Y
8-Offer Parameters	8	23	Ramp Rate Type	Type of Ramp Rate	Examples are: Normal, Emergency, Regulation.			Y			Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	24	Ramp Rate Segment	Energy of Segment of the Ramp Rate	The end value of the Ramp Rate step, monotonically increasing or decreasing (as indicated by the Ramp Rate Direction), expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)			Y			Y
8-Offer Parameters	8	25	Ramp Rate Direction	Direction of the selected Ramp Rate Type and Ramp Rate Segment	Valid directions are: Upward, Downward, Both.			Y			Y
8-Offer Parameters	8	26	Ramp Rate Value	Ramp Rate associated with the selected Ramp Rate Type for the selected Ramp Rate Segment and Ramp Rate Direction	The NERC definition of Ramp Rate is the rate, expressed in megawatts per minute, by which a generator changes its output. For a Demand Resource, the Ramp Rate is the rate, expressed in megawatts per minute, by which a Demand Resource changes its Load.			Y			Y
8-Offer Parameters	8	30	Offer Dispatch Type	Type of Offer	Examples are Flexible (resource follows basepoint signals) or Fixed (resource requests DA commitment and RT schedules of 15 minutes or greater)			Y			
8-Offer Parameters	8	31	Offer Segment MW	Energy of Segment of the Offer	The end value of the offer step, monotonically increasing, expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)			Y			
8-Offer Parameters	8	32	Offer Segment Price	Price of Segment of the Offer	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	33	Offer Segment Hour	Hour of Segment of the Offer	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
8-Offer Parameters	8	34	Startup Cost	Cost of starting a response activity	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
8-Offer Parameters	8	35	Strike Price	Threshold Price	Expressed as a decimal value of price/MW.			Y			
8-Offer Parameters	8	36	Offer Expiration Date	Date of Expiration of the Offer	This applies to DAM only.			Y			
8-Offer Parameters	8	37	Startup Cost Type	Type of startup cost	The type of Start Up Cost included in the offer. Options may include: Select cold, intermediate, hot or shutdown.			Y			
8-Offer Parameters	8	38	Offer Commit Status	Commitment status of offer	Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc.			Y			Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	39	Offer Dispatch Status	Dispatch Status of Offer	Product-specific commitment status types included with offer. Examples include: economic, emergency, not participating, not qualified, and self-schedule. May also be used to temporarily opt out of DR Events and to override the normal operational constraints. The opt-out can be specified using the following criteria: • All events in a program indefinitely (unspecified time period) • Specific DR Event • All events in a specific time period. • Other triggered programs for which an asset or DR resource is already called upon (reduce double counting of available capacity)			Y			Y
8-Offer Parameters	8	331	Offer Price Curve Slope	Flag to smooth the offer segments from step function to slope				Y			
8-Offer Parameters	8	332	Strike Price Type	Type of strike price	Indicates the type of strike price. Options may include: buy or sell.			Y			
8-Offer Parameters	8	40	Market Clearing Day	Market Clearing Day of the Offer				Y			
8-Offer Parameters	8	41	Schedule Name	Name or tag of the Offer				Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	42	Schedule Description	Description of the Offer				Y			
8-Offer Parameters	8	43	Schedule Status	Status of the Offer				Y			
8-Offer Parameters	8	50	Portfolio Name	Name of an aggregation of Resources for market participation				Y			
8-Offer Parameters	8	71	Constraint Type	Type of operational, schedule or offer constraint	Types of operational, offer or schedule parameters. Examples include: Select Operational Minimum Runtime, Schedule Minimum Runtime, Operational Maximum Runtime, Schedule Maximum Runtime, Minimum Load, Maximum Load, Minimum Downtime, Minimum Starts, Maximum Energy, Maximum Starts, Time of Day schedule constraints, Black out date, Maximum consecutive days of participation, Maximum calls per day, Minimum Advanced Notification, Minimum duration of participation, etc.			Y			Y
8-Offer Parameters	8	72	Constraint Interval	The timeframe over which the constraint type applies.	Typically daily, hourly, weekly, date			Y			Y
8-Offer Parameters	8	73	Constraint Value	Value of the Constraint Type and Interval				Y			Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	0	Instruction ID		Unique identifier assigned to each instruction.			Y			
9-Energy Market	9	10	Energy Schedule - Start Time	Start Time of the Energy Schedule	A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).			Y			Y
9-Energy Market	9	11	Energy Schedule - End Time	End Time of the Energy Schedule	A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).			Y			
9-Energy Market	9	12	Energy Schedule - Interval Start Time	Start Time of the Energy Interval within the Energy Schedule	The start time of a specific energy schedule interval			Y			
9-Energy Market	9	13	Energy Schedule - Cleared MW Interval Value	The Energy Value of cleared MW for the Time Interval within the Energy Schedule	The offered energy MW that have cleared the market.			Y			
9-Energy Market	9	14	Energy Schedule - Cleared Price	Awarded Price	The market clearing price for the cleared energy MW.			Y			
9-Energy Market	9	15	Schedule ID		Unique identifier assigned to each schedule.			Y			



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Request Title: Master Data [Requirements Elements](#) List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	20	Base Point	Per-interval dispatch instruction	A Dispatch is a real-time instruction to a Resource to move to a Base Point at a specific time (Resource-Specific Deployment) or a set of real-time instructions to multiple Resources (Bulk Deployment). A Resource-Specific Deployment is the deployment, via established Communication Methods initiated by the System Operator, of one or more discrete and/or unique Resources designated to provide a selected service.			Y			
9-Energy Market	9	21	Breaker Status	Status of the Breaker for the Resource				Y			
9-Energy Market	9	22	Output MW	Real Power Output of the Distributed Generator	Expressed in MW			Y			
9-Energy Market	9	23	Output MVAR	Reactive Power Output of the Distributed Generator	Expressed in Mvar			Y			
9-Energy Market	9	24	DR Bus Load MW	Instantaneous Bus Load of a Demand Resource providing Ancillary Services	Demand is the rate at which electric energy is being used by the customer (NERC Definition). Expressed in MW. This element only applies to DR			Y			



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	25	Set Point	Final dispatch target level	The real-time desired MW output signal calculated for a specific Resource by the Transmission Provider's control system on a specified periodicity that is equal to the current Energy Dispatch Target plus the Regulating Reserve Deployment instruction (which may be positive or negative) plus an adjustment to the Energy Dispatch Target to account for Contingency Reserve Deployment Instructions. The Setpoint Instruction represents the desired output level of the Resource.			Y			
10-Ancillary Service Market	10	0	Ancillary Service Instruction ID		Unique identifier assigned to each ancillary service instruction.			Y			
10-Ancillary Service Market	10	10	Ancillary Service Product Type	Type of Ancillary Service product(s) the Resource is enrolling to provide				Y			Y
10-Ancillary Service Market	10	11	Have Engineering Diagram	Flag set if One-Line Diagrams have been submitted				Y			
10-Ancillary Service Market	10	12	Ancillary Service Award - Start Time	Start Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.			Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
10-Ancillary Service Market	10	13	Ancillary Service Award - End Time	End Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.			Y			
10-Ancillary Service Market	10	14	Ancillary Service Award - Interval Start Time	Start Time of the ancillary service Interval within the ancillary service Award and the ancillary service Value of the Time Interval	The start time of a specific ancillary service schedule interval			Y			
10-Ancillary Service Market	10	15	Ancillary Service Award - Interval Value	The awarded Value for the Time Interval within the ancillary service Award	The value associated with a specific ancillary service schedule interval			Y			
10-Ancillary Service Market	10	16	Ancillary Service Award - Cleared Price	Awarded Price	The market clearing price for the cleared ancillary service product MW.			Y			
10-Ancillary Service Market	10	17	Ancillary Service Schedule ID		Unique identifier assigned to each ancillary service schedule.			Y			
10-Ancillary Service Market	10	20	Ancillary Service Product Qualification Type	Type of Qualification	Examples include initial, requalification, etc.			Y			
10-Ancillary Service Market	10	21	Synchronization Test Date	Target Date of Test of Synchronization to the grid				Y			



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Requirements-Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
10-Ancillary Service Market	10	22	Ancillary Service Product Type Qualification Date	Date of Qualification of the Resource				Y			
10-Ancillary Service Market	10	23	Ancillary Service Product Type Qualified	Type of Ancillary Service Product(s) for which the Resource has Qualified				Y			
10-Ancillary Service Market	10	24	Requalification Requirement	Flag set if Requalification is Required				Y			
10-Ancillary Service Market	10	31	Reserve Pickup Flag	Flag set if this is a Reserve Pickup schedule	Reserve Service is a type of Demand Response service in which Demand Resources are obligated to be available to provide Demand reduction Energy Service, based on reserve capacity requirements that are established to meet applicable reliability standards. Reserve Services are defined by short-term response rates (Ramp Period) and synchronization with the electricity grid (i.e., spinning and non-spinning reserves).			Y			



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Request Title: Master Data **Requirements Elements** List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
10-Ancillary Service Market	10	32	Regulation Base Point	Per-interval Regulation dispatch instruction	Regulation Service is a type of Demand Response service in which a Demand Resource corrects for short-term changes in electricity use that might affect the stability of the power system, matching generation and load to maintain a desired frequency. Demand Resources providing Regulation Service are subject to dispatch continuously during a commitment period. Provision of Regulation Service does not correlate to Demand Response deployment terms of the Event timelines, deadlines and durations.			Y			
10-Ancillary Service Market	10	33	Base Load MW	Level of Load at time of dispatch				Y			
11-Capacity Market	11	10	Capacity Type	Type of Capacity	Capacity Service is a type of Demand Response service in which Demand Resources are obligated over a defined period of time to be available to deliver upon deployment by the System Operator or Service Provider. Examples: Hourly, Monthly, etc.			Y			Y
11-Capacity Market	11	11	Capacity Type description	Description of the Type of Capacity				Y			Y
11-Capacity Market	11	20	Peak Value	Measurement of Peak				Y			



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
11-Capacity Market	11	21	Peak Type	Type of measurement of Peak	Examples are: Annual, Monthly, Weekly, and Seasonal.			Y			
11-Capacity Market	11	22	Peak Date/Time	Date and Time of measurement of Peak				Y			
11-Capacity Market	11	23	Nominal Capacity	Nominated load	Expressed as a decimal value.			Y			Y
11-Capacity Market	11	24	Qualified Capacity	Nominal ICAP derated for performance	Derated based on past performance.			Y			Y
11-Capacity Market	11	30	Capacity Obligation Period Type	Type of Capacity Obligation Time Period within which the Resource is obligated	Examples are: All hours, Business hours 1, Business hours 2, Business Hours 3, Non-Business hours.			Y			
11-Capacity Market	11	31	Capacity Obligation Period	Period of time for which the Capacity Resource is Obligated	Examples include: month, season, year, etc.			Y			
11-Capacity Market	11	40	Minimum Payment Nomination	Strike price for the economic dispatch of the energy component of the capacity program	Expressed in Price/MW.			Y			
11-Capacity Market	11	41	Capacity Supply Obligation	Capacity Obligation	This may result from an auction or other clearing mechanism.			Y			
11-Capacity Market	11	50	Capacity Reference ID	Identifier assigned to the External System award	An Award is the selection of a Resource to provide energy, ancillary services, or capacity for a future time period. Expressed as a string.			Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
11-Capacity Market	11	991	Capacity Comments	Comments associated with the Capacity market				Y			
12-Event and Performance	12	10	Event ID	Identifier assigned to the Event	An Event consists of the time periods, deadlines, and transitions during which Demand Resources perform. The System Operator shall specify the duration and applicability of a Demand Response Event. Some deadlines, time periods, and transitions may not be not applicable to all products or services.			Y			Y
12-Event and Performance	12	11	Deployment Type	Type of Deployment	Examples are: Advanced (Normal), Immediate, Audit/Test			Y			Y
12-Event and Performance	12	12	Event Day	Operating Date of Start of Event				Y			Y
12-Event and Performance	12	13	Event Description	Description of the Event				Y			
12-Event and Performance	12	14	Event Start Time	Time of Start of deployment period for Event	The Deployment Period is the period of time from the Deployment to Release/Recall.			Y			Y
12-Event and Performance	12	15	Operator Comment	Additional Event information provided by the Operator				Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	16	Deployment MW	Absolute or relative Deployment quantity	Expressed as an absolute or relative (%) MW value.			Y			Y
12-Event and Performance	12	17	Event Status	Status of the Event	Examples include: initiated, completed, etc.			Y			Y
12-Event and Performance	12	18	Event End Time	Time of End of deployment period	Release/Recall is the notification, sent from the System Operator or Service Demand Response Provider to the Demand Resource, that the Deployment Period has ended or announcing the time that it will end.			Y			Y
12-Event and Performance	12	19	Event Modification Number	A modification number for the DR event. This is used to indicate if the DR Event has been modified by the Utility. Each time it is modified, this number is incremented.				Y			Y
12-Event and Performance	12	111	Notification Acknowledgement	This is an acknowledgement of the receipt of a DR notification or dispatch. It should include any necessary provisions for non-repudiation.				Y			Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	112	Event Modification Reason Code	The reason the event is being cancelled or modified.				Y			Y
12-Event and Performance	12	113	Load Level Value	Value of the load level to be achieved based on a set of enumerated values (e.g., moderate, high, etc.).							Y
12-Event and Performance	12	21	Baseline Dates	Dates of days used to calculate the Energy Baseline	The Baseline Window is the window of time preceding, and optionally following, a Demand Response Event, over which electricity consumption data is collected for the purpose of establishing a Baseline. The applicability of this term is limited to Meter Before/Meter After, and Baseline Type-I and Type-II.			Y			Y
12-Event and Performance	12	22	Baseline Exclusion Dates	Dates of days Excluded from the calculation of the Energy Baseline				Y			Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	23	Energy Baseline Value	Calculated Energy Baseline	A Baseline is an estimate of the electricity that would have been consumed by a Demand Resource in the absence of a Demand Response Event. The Baseline is compared to the actual metered electricity consumption during the Demand Response Event to determine the Demand Modification Value. Depending on the type of Demand Response product or service, Baseline calculations may be performed in real time or after the fact.			Y			Y
12-Event and Performance	12	24	Energy Baseline Timestamp	Timestamp of Energy Baseline				Y			Y
12-Event and Performance	12	30	Reporting Interval	Interval size required for Reporting				Y			Y
12-Event and Performance	12	31	Measurement Value Timestamp (CIM)	The time when the value was last updated				Y			Y
12-Event and Performance	12	32	Measurement Value (CIM)	Value of the interval reading				Y			Y
12-Event and Performance	12	33	Response Value	Response				Y			Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	34	Measurement Value Type	The type of measurement value.	The Measurement Value Type identifies the type of information provided in the Measurement Value. For example, the Measurement Value type could be energy (kWh/MWh) or demand (KW or MW).			Y			
12-Event and Performance	12	50	Simple Signal Levels	Used as an alternate and simplified representation of the DR signal, whether it be price based or a dispatch. Takes on a small number of finite levels such as NORMAL, MODERATE, and HIGH, SPECIAL							Y



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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	51	Criticality Level	This field defines the level of criticality of this event. The action taken by load control devices for an event can be solely based on this value, or in combination with other Load Control Event fields supported by this device.	For example, additional fields such as Average Load Adjustment Percentage, Duty Cycle, Cooling Temperature Offset, Heating Temperature Offset, Cooling Temperature Set Point or Heating Temperature Set Point can be used in combination with the Criticality level. Criticality Level Level Description Participation 0 Reserved 1 Green Voluntary 2 1 Voluntary 3 2 Voluntary 4 3 Voluntary 5 4 Voluntary 6 5 Voluntary 7 Emergency Mandatory 8 Planned Outage Mandatory 9 Service Disconnect Mandatory 0x0A to 0x0F Utility Defined Utility						Y
12-Event and Performance	12	52	Usage Information	Information about the near real time electricity usage of the DR Resource.							Y
12-Event and Performance	12	991	Event & Performance comments	Comments associated with Event and Performance data				Y			



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
13-Direct Load Control	13	10	Status Check	A signal to require the DR resource status to be sent back. (Only applicable to Direct Load Control)							Y
13-Direct Load Control	13	11	DR Control Command: Direct Load Control Type	The type of DR Direct Load Control Command: e.g. Set Point, Open/Close, Heating Temperature - offset/setpoint, Cooling Temperature - offset/setpoint, Load adjustment offset							Y
13-Direct Load Control	13	12	DR Control Command: Direct Load Control Value	Value associated with the Direct Load Control Type.							Y
13-Direct Load Control	13	13	Duty Cycle	"Duty Cycle : Defines the maximum On state duty cycle as a percentage of time. Example, if the value is 80, the device would be in an "on state" for 80% of the time for the duration of the event. Range of the value is 0 to 100. A value							Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
				of 0xFF indicates the field is not used." (from SEP2.0)							
13-Direct Load Control	13	14	Event Control	Event Control options for randomized start or end times: 1= Randomized Start time, 0=Randomized Start not Applied 1= Randomized End time, 0=Randomized End not Applied. (from SEP2.0)							Y
13-Direct Load Control	13	15	Exception Conditions	This is used to report that the load controller may not behave as commanded because of a variety of conditions including: • Faults in device • Customer override.							Y



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
13-Direct Load Control	13	16	Load Control State	The state of the load, which includes both commanded states and user settings. This may include a schedule of future states if a particular control algorithm for the load controller is being executed.							Y
14-Price and Product	14	10	Product Name	Same as 7.13 Market Product	An identifier for a particular electricity product offering: energy, capacity, ancillary services, etc.	Y					
14-Price and Product	14	11	Product Type	Defines the source and product	Classifications used within industry for trading energy. Examples: PJM Energy, NYISO 10-min Spin, etc.	Y					Y
14-Price and Product	14	12	Product Sub-type	Used to further define product types		Y			Y		
14-Price and Product	14	13	Identifier Source (product)	The Identifier Source references the product identification scheme for the Product Identifier.		Y					



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
14-Price and Product	14	14	Unit of Measure	Attribute of Product Identifier		Y					Y
14-Price and Product	14	15	Currency	Economic unit of exchange in which the total price and price components are stated (e.g. dollars, euros)		Y			Y		Y
14-Price and Product	14	20	Product Identifier	Identifies specific product associated with the price		Y			Y		
14-Price and Product	14	30	Override Unit of Measure	Optional Attribute of Price object If this is used, then Unit of Measure is not applicable		Y					
14-Price and Product	14	31	Product Price	The sum of all Price Component Values for a given product (Total Price).		Y					Y
14-Price and Product	14	32	Product Price Factor	Terms of use attribute of Product Price	Examples: Price_absolute, Price_relative, Price_multiplier	Y			Y		
14-Price and Product	14	33	Price Component Type	The portion of the price to which the corresponding value applies.	Examples: Energy, congestion, losses	Y					
14-Price and Product	14	34	Price Component Value	The value of the price component.		Y					



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
14-Price and Product	14	35	Price Location	The location at which the price is applicable.		Y					
14-Price and Product	14	36	Price Type	Time characteristic of the price	The type of price (day-ahead, real-time, etc.).	Y					
14-Price and Product	14	37	Delivery Time	Time at which the product is available for physical consumption		Y			Y		Y
14-Price and Product	14	38	Delivery Interval	The duration over which the product is available for physical consumption		Y			Y		Y
14-Price and Product	14	40	Source Location Identifier	The identifier of the source location of the product for which the price applies		Y			Y		
14-Price and Product	14	41	Source Location Identifier Type	The type of source location of the product for which the price applies		Y					



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03, PAP 04 and PAP 09

4. Supporting Documentation

a. Description of Request:

2010 REQ Annual Plan Item 9 and 2010 WEQ Annual Plan Item 6 – “Develop Smart Grid Wholesale and Retail Electric Standards”

b. Description of Recommendation:

This recommendation provides the data [requirements elements](#) related to the use cases developed for Priority Action Plan 03 and 09 as part of the phase one effort

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the development of standard DR and DER signals.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- March 11, 2010 Meeting Notes – To be posted
- March 18, 2010 Meeting Notes – To be posted
- March 25, 2010 Meeting Notes – To be posted
- April 1, 2010 Meeting Notes – To be posted
- April 8, 2010 Meeting Notes – To be posted
- April 29, 2010 Meeting Notes – To be posted
- May 13, 2010 Meeting Notes – To be posted
- May 20, 2010 Meeting Notes – To be posted
- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes – To be posted
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03, PAP 04 and PAP 09

- August 26, 2010 Meeting Notes – http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc
- September 9, 2010 Meeting Notes – http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes – http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes – To be posted



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
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Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

1. RECOMMENDED ACTION:

☒ Accept as requested
☐ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☒ Initiation
☐ Modification
☐ Interpretation
☐ Withdrawal

☐ Principle
☐ Definition
☐ Business Practice Standard
☐ Document
☒ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☒ Initiation
☐ Modification
☐ Interpretation
☐ Withdrawal

☐ Principle
☐ Definition
☐ Business Practice Standard
☐ Document
☒ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY: The Master Data [RequirementsElements](#) List contains the list of data elements used in the use cases that were developed for PAP 03 and PAP 09 in the phase one effort.



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
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Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

RECOMMENDED STANDARDS:

REQ-020.1 Smart Grid Standards Data [RequirementsElements](#) Table

Introduction

This Business Practice Standard contains the list of data elements used in Business Practice Standards [WEQREQ-016](#) and [WEQREQ-018](#). Specific application of the data elements to a given use case contained in [WEQREQ-016](#) and [WEQREQ-018](#) are identified within the appropriate Business Practice Standard. This Business Practice Standard and data elements included herein are not intended to [\(i\) require the use of any of these data elements, \(ii\) require the provision or purchase of any products, programs, rates, markets or services, or \(iii\) supersede or replace](#) applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this standard.

~~All data element names and implied or stated structures are not intended to specify specific message payloads or information object. The intent is to clearly specify the business information that may be necessary to be exchanged to make effective and reasonable business decisions, and NAESB understands that standards or implementations that do not directly use such schemas and element names may conform to these requirements through clearly defined mapping documentation.~~

~~Capitalization of words within the Short Description or Long Description of a data element refers to the name of another data element within this Master Data Element List, not a NAESB defined term.~~

REQ-020.1.1 Alphabetical Listing by Data Element Name

* Listing by Category ID and Category Element ID begins [on page 245 in section REQ-020.1.2](#)

Late Comments Submitted by D. Pratt, J. Phillips and B. Bartell



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	10	Address1	Address line 1				Y			Y
2-Location	2	11	Address2	Address line 2				Y			Y
10-Ancillary Service Market	10	16	Ancillary Service Award - Cleared Price	Awarded Price	The market clearing price for the cleared ancillary service product MW.			Y			
10-Ancillary Service Market	10	13	Ancillary Service Award - End Time	End Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.			Y			
10-Ancillary Service Market	10	14	Ancillary Service Award - Interval Start Time	Start Time of the ancillary service Interval within the ancillary service Award and the ancillary service Value of the Time Interval	The start time of a specific ancillary service schedule interval			Y			
10-Ancillary Service Market	10	15	Ancillary Service Award - Interval Value	The awarded Value for the Time Interval within the ancillary service Award	The value associated with a specific ancillary service schedule interval			Y			
10-Ancillary Service Market	10	12	Ancillary Service Award - Start Time	Start Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.			Y			
10-Ancillary Service Market	10	0	Ancillary Service Instruction ID	<u>Unique identifier assigned to each ancillary service instruction.-</u>	<u>Unique identifier assigned to each ancillary service instruction.</u>			Y			

Late Comments Submitted by D. Pratt, J. Phillips and B. Bartell



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
10-Ancillary Service Market	10	20	Ancillary Service Product Qualification Type	Type of Qualification	Examples include initial, requalification, etc.			Y			
10-Ancillary Service Market	10	10	Ancillary Service Product Type	Type of Ancillary Service product(s) the Resource is enrolling to provide				Y			Y
10-Ancillary Service Market	10	22	Ancillary Service Product Type Qualification Date	Date of Qualification of the Resource				Y			
10-Ancillary Service Market	10	23	Ancillary Service Product Type Qualified	Type of Ancillary Service Product(s) for which the Resource has Qualified				Y			
10-Ancillary Service Market	10	17	Ancillary Service Schedule ID	<u>-Unique identifier assigned to each ancillary service schedule.</u>	<u>Unique identifier assigned to each ancillary service schedule.</u>			Y			
6-Device and Qualification	6	229 4	ANSI Compliance	ANSI standard with which the Meter complies				Y			
1-General Asset / Resource	1	30	Asset Group ID	The identifier of a group of assets	An Asset Group is a logical entity that has a reportable interval-level consumption.			Y			Y
1-General Asset / Resource	1	31	Asset Group Name	Name of the aggregated group of assets				Y			Y
1-General Asset / Resource	1	12	Asset ID	The unique identifier of the asset				Y			Y

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For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	83	Asset Manufacture Date	Date of Manufacture of the Asset							Y
6-Device and Qualification	6	80	Asset Manufacturer	Manufacturer of the Asset							Y
6-Device and Qualification	6	81	Asset Model	Model identifier of the Asset, assigned by the Manufacturer							Y
2-Location	2	51	Asset Multiplier	Number of identical Assets within the Service Location				Y			
1-General Asset / Resource	1	13	Asset Name	The name of the asset				Y			
5-Business Entity Relationships	5	90	Asset Operator ID	The identifier of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.							Y
5-Business Entity Relationships	5	91	Asset Operator Name	The name of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.							Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	92	Asset Owner ID	The Identifier of the business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).							Y
5-Business Entity Relationships	5	93	Asset Owner Name	The Name of business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).							Y
6-Device and Qualification	6	84	Asset Type	Type of Asset	Examples are: load reduction or response (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.						Y
6-Device and Qualification	6	82	Asset Version	Model version identifier, assigned by the Manufacturer							Y
10-Ancillary Service Market	10	33	Base Load MW	Level of Load at time of dispatch				Y			
9-Energy Market	9	20	Base Point	Per-interval dispatch instruction	A Dispatch is a real-time instruction to a Resource to move to a Base Point at a specific time (Resource-Specific Deployment) or a set of real-time instructions to multiple Resources (Bulk Deployment). A Resource-Specific Deployment is the deployment, via established Communication Methods initiated by the System Operator, of one or			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
					more discrete and/or unique Resources designated to provide a selected service.						
12-Event and Performance	12	21	Baseline Dates	Dates of days used to calculate the Energy Baseline	The Baseline Window is the window of time preceding, and optionally following, a Demand Response Event, over which electricity consumption data is collected for the purpose of establishing a Baseline. The applicability of this term is limited to Meter Before/Meter After, and Baseline Type-I and Type-II.			Y			Y
12-Event and Performance	12	22	Baseline Exclusion Dates	Dates of days Excluded from the calculation of the Energy Baseline				Y			Y
1-General Asset / Resource	1	51	Batch Load Flag	Flag set if the Resource is a Batch Load				Y			
9-Energy Market	9	21	Breaker Status	Status of the Breaker for the Resource				Y			
6-Device and Qualification	6	45	Breaker Status During Event	Status of the Breaker for the Service Location during an Emergency Event				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
1-General Asset / Resource	1	50	Business Segment	SIC or NAICS code of the Service Location				Y			
6-Device and Qualification	6	43	Capable of Synchronizing to Grid	Flag set if the Service Location is capable of Synchronizing to the Grid				Y			
11-Capacity Market	11	991	Capacity Comments	Comments associated with the Capacity market				Y			
11-Capacity Market	11	31	Capacity Obligation Period	Period of time for which the Capacity Resource is Obligated	Examples include: month, season, year, etc.			Y			
11-Capacity Market	11	30	Capacity Obligation Period Type	Type of Capacity Obligation Time Period within which the Resource is obligated	Examples are: All hours, Business hours 1, Business hours 2, Business Hours 3, Non-Business hours.			Y			
11-Capacity Market	11	50	Capacity Reference ID	Identifier assigned to the External System award	An Award is the selection of a Resource to provide energy, ancillary services, or capacity for a future time period. Expressed as a string.			Y			
11-Capacity Market	11	41	Capacity Supply Obligation	Capacity Obligation	This may result from an auction or other clearing mechanism.			Y			
11-Capacity Market	11	10	Capacity Type	Type of Capacity	Capacity Service is a type of Demand Response service in which Demand Resources are obligated over a defined period of time to be available to deliver upon deployment by the System Operator or Service Provider. Examples: Hourly, Monthly, etc.			Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
11-Capacity Market	11	11	Capacity Type description Capacity Type Description	Description of the Type of Capacity				Y			Y
2-Location	2	12	City	City				Y			Y
2-Location	2	50	Competitive Choice Area	Flag set if the Service Location is in an area with Competitive Choice				Y			
4-Grid Connection	4	12	Connect Voltage	Voltage level	Voltage at connection.			Y			
2-Location	2	72	Connection Address	Address associated with the Connection Type	Example: Address of ICCP Connection, IP address			Y			
2-Location	2	71	Connection Type	Additional type of connection associated with the Service Delivery Point	Example: ICCP Connection, IP address			Y			
8-Offer Parameters	8	72	Constraint Interval	The timeframe over which the constraint type applies.	Typically daily, hourly, weekly, date			Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	71	Constraint Type	Type of operational, schedule or offer constraint	Types of operational, offer or schedule parameters. Examples include: Select Operational Minimum Runtime, Schedule Minimum Runtime, Operational Maximum Runtime, Schedule Maximum Runtime, Minimum Load, Maximum Load, Minimum Downtime, Minimum Starts, Maximum Energy, Maximum Starts, Time of Day schedule constraints, Black out date, Maximum consecutive days of participation, Maximum calls per day, Minimum Advanced Notification, Minimum duration of participation, etc.			Y			Y
8-Offer Parameters	8	73	Constraint Value	Value of the Constraint Type and Interval				Y			Y
3-Contact	3	31	Contact Address Data	Method-dependent Address of the Contact	This identifies specific information required for the contact method selected.			Y			
3-Contact	3	991	Contact Comments	Comments associated with the Contact				Y			
3-Contact	3	30	Contact Method	Method of communication with the Contact	This identifies the various types of communication options (phone, email, etc.) to which may be used.			Y			
3-Contact	3	32	Contact Method Priority	Order in which a Communication Method should be selected for a Contact	A Communication Method is the medium by which an object communicates with another object for instruction, measurement, or control. The user specifies the sequence in which each medium is to be used when being contacted.			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
3-Contact	3	23	Contact MiddleMiddle Name	Middle Name of the Contact				Y			
3-Contact	3	11	Contact Priority	Order in which this Contact should be selected	This is used when multiple contacts are defined.			Y			
3-Contact	3	10	Contact Type	Interest code associated with a Contact	This is a classification defining the function a particular contact serves. It supports "who to call for what needs" decisions. Examples are: Primary, Secondary, Billing, Third Party, and Authorized Representative.			Y			
2-Location	2	15	Country	Country				Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	51	Criticality Level	This field defines the level of criticality of this event. The action taken by load control devices for an event can be solely based on this value, or in combination with other Load Control Event fields supported by this device.	For example, additional fields such as Average Load Adjustment Percentage, Duty Cycle, Cooling Temperature Offset, Heating Temperature Offset, Cooling Temperature Set Point or Heating Temperature Set Point can be used in combination with the Criticality level. Criticality Level Level Description Participation 0 Reserved 1 Green Voluntary 2 1 Voluntary 3 2 Voluntary 4 3 Voluntary 5 4 Voluntary 6 5 Voluntary 7 Emergency Mandatory 8 Planned Outage Mandatory 9 Service Disconnect Mandatory 0x0A to 0x0F Utility Defined Utility						Y
6-Device and Qualification	6	291	CT Ratio	Ratio of the Current Transformer				Y			
14-Price and Product	14	15	Currency	Economic unit of exchange in which the total price and price components are stated (e.g. dollars, euros)		Y			Y		Y
6-Device and Qualification	6	228	Date of Last Meter Test	Date of Last Test of the Meter				Y			
7-Market / Program Enrollment	7	31	Day Ahead Flag	Flag set if the Resource will be participating in the Day-Ahead market				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
14-Price and Product	14	38	Delivery Interval	The duration over which the product is available for physical consumption		Y			Y		Y
14-Price and Product	14	37	Delivery Time	Time at which the product is available for physical consumption		Y			Y		Y
5-Business Entity Relationships	5	14	Demand Response Controlling Entity	<u>An identifier for the Service Provider issuing the DR event deployment instructions.</u>	~~An identifier for the Service Provider issuing the DR event deployment instructions.~~						Y
5-Business Entity Relationships	5	13	Demand Response Provider	<u>The entity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response products.</u>	~~The entity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response products.~~						Y
12-Event and Performance	12	16	Deployment MW	Absolute or relative Deployment quantity	Expressed as an absolute or relative (%) MW value.			Y			Y
12-Event and Performance	12	11	Deployment Type	Type of Deployment	Examples are: Advanced (Normal), Immediate, Audit/Test			Y			Y
5-Business Entity Relationships	5	80	Designated Dispatch Entity ID	Identifier assigned to the Designated Dispatch Entity	The Designated Dispatch Entity receives and processes Demand Resource Dispatch instructions or market information and may provide response information.			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	81	Designated Dispatch Entity Name	Name of the Designated Dispatch Entity				Y			
6-Device and Qualification	6	70	Device Class	<u>Note: From SEP2.0 Enumeration representing the Device Class to apply the current Load Control Event.</u> <u>0 HVAC compressor or furnace</u> <u>1 Strip Heaters/Baseboard Heaters</u> <u>2 Water Heater</u> <u>3 Pool Pump/Spa/Jacuzzi</u> <u>4 Smart Appliances</u> <u>5 Irrigation Pump</u> <u>6 Managed Commercial & Industrial (C&I) loads</u> <u>7 Simple misc. (Residential On/Off) loads</u> <u>8 Exterior Lighting</u> <u>9 Interior Lighting</u> <u>10 Electric Vehicle</u> <u>11 Generation Systems</u> <u>12 to 15 Reserved</u>	<u>Note: From SEP2.0 Enumeration representing the Device Class to apply the current Load Control Event.</u> <u>0 HVAC compressor or furnace</u> <u>1 Strip Heaters/Baseboard Heaters</u> <u>2 Water Heater</u> <u>3 Pool Pump/Spa/Jacuzzi</u> <u>4 Smart Appliances</u> <u>5 Irrigation Pump</u> <u>6 Managed Commercial & Industrial (C&I) loads</u> <u>7 Simple misc. (Residential On/Off) loads</u> <u>8 Exterior Lighting</u> <u>9 Interior Lighting</u> <u>10 Electric Vehicle</u> <u>11 Generation Systems</u> <u>12 to 15 Reserved</u>						Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	991	Distributed Generator Comments	Comments associated with the Distributed Generator				Y			
6-Device and Qualification	6	32	Distributed Generator Fuel Type	Type of Fuel consumed by the Distributed Generator				Y			
6-Device and Qualification	6	34	Distributed Generator Manufacturer	Manufacturer of the Distributed Generator				Y			Y
6-Device and Qualification	6	39	Distributed Generator Name	Name of the Distributed Generator				Y			
6-Device and Qualification	6	33	Distributed Generator Permit Type	Type of environmental authorization required to operate the Distributed Generator	The Environmental Authority is a regulatory authority responsible for the development, reporting, and enforcement of environmental activities.			Y			
6-Device and Qualification	6	30	Distributed Generator Type	Type of Distributed Generator	This technology characteristic of the Distributed Generator, such as combined cycle, induction, etc.			Y			
9-Energy Market	9	24	DR Bus Load MW	Instantaneous Bus Load of a Demand Resource providing Ancillary Services	Demand is the rate at which electric energy is being used by the customer (NERC Definition). Expressed in MW. This element only applies to DR			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
13-Direct Load Control	13	11	DR Control Command: Direct Load Control Type	The type of DR Direct Load Control Command: e.g. Set Point, Open/Close, Heating Temperature - offset/setpoint, Cooling Temperature - offset/setpoint, Load adjustment offset							Y
13-Direct Load Control	13	12	DR Control Command: Direct Load Control Value	Value associated with the Direct Load Control Type.							Y
1-General Asset / Resource	1	22	DR Resource Group ID	Grouping of Resources that can respond to the same DR signal							Y
3-Contact	3	12	DUNS Number	DUNS business number				Y			
13-Direct Load Control	13	13	Duty Cycle	"Duty Cycle : Defines the maximum On state duty cycle as a percentage of time. Example, if the value is 80, the device would be in an "on state" for 80% of the time for the duration of the event. Range of the value is 0 to 100. A value of 0xFF indicates the field is not used." (from SEP2.0)							Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	21	Effective Enrollment Date	Effective Start Date for the Enrollment	Market Enrollment is the collection of enrollment or tariff data for a Demand Resource to provide a specific market product or service.			Y			Y
2-Location	2	40	Electrical Node ID	Identifier assigned to the Electrical Node at which the Service Location is connected				Y			Y
2-Location	2	41	Electrical Node Name	Name of the Electrical Node at which the Service Location is connected				Y			Y
2-Location	2	42	Electrical Node Type	Type of Electrical Node at which the Service Location is attached				Y			Y
12-Event and Performance	12	24	Energy Baseline Timestamp	Timestamp of Energy Baseline				Y			Y
12-Event and Performance	12	23	Energy Baseline Value	Calculated Energy Baseline	A Baseline is an estimate of the electricity that would have been consumed by a Demand Resource in the absence of a Demand Response Event. The Baseline is compared to the actual metered electricity consumption during the Demand Response Event to determine the Demand Modification Value. Depending on the type of Demand Response product or service, Baseline calculations may be performed in real time or after the fact.			Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	13	Energy Schedule - Cleared MW Interval Value	The Energy Value of cleared MW for the Time Interval within the Energy Schedule	The offered energy MW that have cleared the market.			Y			
9-Energy Market	9	14	Energy Schedule - Cleared Price	Awarded Price	The market clearing price for the cleared energy MW.			Y			
9-Energy Market	9	11	Energy Schedule - End Time	End Time of the Energy Schedule	A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).			Y			
9-Energy Market	9	12	Energy Schedule - Interval Start Time	Start Time of the Energy Interval within the Energy Schedule	The start time of a specific energy schedule interval			Y			
9-Energy Market	9	10	Energy Schedule - Start Time	Start Time of the Energy Schedule	A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).			Y			Y
7-Market / Program Enrollment	7	25	Enrollment End Date	Date of Termination of Enrollment				Y			Y
7-Market / Program Enrollment	7	22	Enrollment Status	Status of the Enrollment for the Facility or Resource	Examples: Pending Enrollment, Approved Enrollment, Under Review, Denied, Separated			Y			Y
12-Event and Performance	12	991	Event & Performance comments <u>Perform</u> <u>ance Comments</u>	Comments associated with Event and Performance data				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
13-Direct Load Control	13	14	Event Control	Event Control options for randomized start or end times: 1= Randomized Start time, 0=Randomized Start not Applied 1= Randomized End time, 0=Randomized End not Applied. (from SEP2.0)							Y
12-Event and Performance	12	12	Event Day	Operating Date of Start of Event				Y			Y
12-Event and Performance	12	13	Event Description	Description of the Event				Y			
12-Event and Performance	12	18	Event End Time	Time of End of deployment period	Release/Recall is the notification, sent from the System Operator or Service Demand Response Provider to the Demand Resource, that the Deployment Period has ended or announcing the time that it will end.			Y			Y
12-Event and Performance	12	10	Event ID	Identifier assigned to the Event	An Event consists of the time periods, deadlines, and transitions during which Demand Resources perform. The System Operator shall specify the duration and applicability of a Demand Response Event. Some deadlines, time periods, and transitions may not be not applicable to all products or services.			Y			Y

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12-Event and Performance	12	19	Event Modification Number	A modification number for the DR event. This is used to indicate if the DR Event has been modified by the Utility. Each time it is modified, this number is incremented.				Y			Y
12-Event and Performance	12	112	Event Modification Reason Code	The reason the event is being cancelled or modified.				Y			Y
12-Event and Performance	12	14	Event Start Time	Time of Start of deployment period for Event	The Deployment Period is the period of time from the Deployment to Release/Recall.			Y			Y
12-Event and Performance	12	17	Event Status	Status of the Event	Examples include: initiated, completed, etc.			Y			Y
13-Direct Load Control	13	15	Exception Conditions	This is used to report that the load controller may not behave as commanded because of a variety of conditions including: • Faults in device • Customer override.							Y
5-Business Entity Relationships	5	991	External Entity Comments	Comments associated with the External Entity				Y			
3-Contact	3	21	First Name	First Name of the Contact				Y			
1-General Asset / Resource	1	41	Gen_Billing_ID	Billing Identifier assigned to the Resource				Y			

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1-General Asset / Resource	1	40	Gen_EMS_ID	Alias or point Identifier assigned to the Resource				Y			
1-General Asset / Resource	1	991	General Resource Comments	General comments associated with the Resource				Y			
2-Location	2	20	GPS Coordinates	Latitude and longitude				Y			Y
4-Grid Connection	4	991	Grid Connection Comments	Comments associated with the Grid Connection of the Resource				Y			
10-Ancillary Service Market	10	11	Have Engineering Diagram	Flag set if One-Line Diagrams have been submitted				Y			
14-Price and Product	14	13	Identifier Source (product)	The Identifier Source references the product identification scheme for the Product Identifier.		Y					
6-Device and Qualification	6	37	In-Service Date	Date the Distributed Generator became operational				Y			
6-Device and Qualification	6	36	Installation Date of Distributed Generator	Date of Installation of the Distributed Generator				Y			
9-Energy Market	9	0	Instruction ID	<u>-Unique identifier assigned to each instruction.</u>	<u>Unique identifier assigned to each instruction.</u>			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	41	Interconnection Agreement Type	Type of Interconnection Agreement between the Distributed Generator or Service Location and the TDSP				Y			
6-Device and Qualification	6	42	Interconnection Limits	Limits associated with the Interconnection of the Distributed Generator or Service Location				Y			
3-Contact	3	22	Last Name	Last Name of the Contact				Y			
7-Market / Program Enrollment	7	30	Lead Time	Time between the advanced notification and deployment	Notification is the transmittal of a Deployment message.			Y			Y
13-Direct Load Control	13	16	Load Control State	The state of the load, which includes both commanded states and user settings. This may include a schedule of future states if a particular control algorithm for the load controller is being executed.							Y
12-Event and Performance	12	113	Load Level Value	Value of the load level to be achieved based on a set of enumerated values (e.g., moderate, high, etc.).							Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	52	Load Resource Control Device	Type of Control Device at a Service Location or deployed by a Response Method				Y			
5-Business Entity Relationships	5	30	Load Serving Entity ID	Identifier assigned to the LSE	The Load-Serving Entity serves end users and sells electric energy to end users.			Y			
5-Business Entity Relationships	5	31	Load Serving Entity Name	Name of the LSE				Y			
2-Location	2	991	Location Comments	Comments associated with the Service Location				Y			
4-Grid Connection	4	10	Loss Factor Type	Type of Loss Factor				Y			
4-Grid Connection	4	11	Loss Factor Value	Loss Factor	Expressed as a decimal value.			Y			
6-Device and Qualification	6	35	Manufactured Date of Distributed Generator	Date of Manufacturer of the Distributed Generator				Y			Y
7-Market / Program Enrollment	7	12	Market	Type of wholesale market				Y			
8-Offer Parameters	8	40	Market Clearing Day	Market Clearing Day of the Offer				Y			
7-Market / Program	7	991	Market Enrollment Comments	Comments associated with the Enrollment				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
Enrollment											
7-Market / Program Enrollment	7	13	Market Product	Market Product	Product types include the following: energy, capacity, regulation, operating reserves (spinning or non-spin).			Y			Y
6-Device and Qualification	6	28	Maximum Error	Error of the Meter, including end-to-end Maximum Error				Y			
6-Device and Qualification	6	2293	Measurement Interval	Interval of time between Measurement readings	This is the time between electricity meter recordings. The Measurement records the consumption or supply of an End Device. An End Device is a physical end-use device that consumes or supplies electricity.			Y			
12-Event and Performance	12	32	Measurement Value (CIM)	Value of the interval reading				Y			Y
12-Event and Performance	12	31	Measurement Value Timestamp (CIM)	The time when the value was last updated				Y			Y
12-Event and Performance	12	34	Measurement Value Type	The type of measurement value.	The Measurement Value Type identifies the type of information provided in the Measurement Value. For example, the Measurement Value type could be energy (kWh/MWh) or demand (KW or MW).			Y			
6-Device and Qualification	6	26	Meter Accuracy Class	Accuracy Class of the Meter				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	229 6	Meter Asset Comments	Comments associated with the Meter Asset				Y			
5-Business Entity Relationships	5	60	Meter Authority ID	Identifier assigned to the Metering Authority	The Metering Authority provides electric usage data necessary to determine the performance of a Resource.			Y			
5-Business Entity Relationships	5	61	Meter Authority Name	Name of the Metering Authority				Y			
6-Device and Qualification	6	10	Meter Configuration	Configuration of the Meter at the Facility	The CIM defines the Meter as the physical asset that performs the metering role of the ServiceDeliveryPoint. It is used for measuring consumption and detecting events.			Y			
6-Device and Qualification	6	224	Meter Correction Factors	Device-specific Factors used to adjust for atmospheric changes at the point of installation of the Meter				Y			
6-Device and Qualification	6	227	Meter Device QA Plan	Quality Assurance plan for maintenance and testing of the Meter				Y			
6-Device and Qualification	6	20	Meter ID	Identifier assigned to the Meter				Y			
6-Device and Qualification	6	221	Meter Installation Date	Date of Installation of the Meter				Y			
5-Business Entity	5	50	Meter Installation Provider ID	Identifier assigned to the Meter Installation Provider				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
Relationships											
5-Business Entity Relationships	5	51	Meter Installation Provider Name	Name of the Meter Installation Provider	This is the ~~competitive~~ -meter entity for the meter device.			Y			
6-Device and Qualification	6	223	Meter Installer License	Professional License Number of the Installer of the Meter	~~[Are these Meter elements correctly checked Y for Wholesale but not for Retail?]~~			Y			
6-Device and Qualification	6	27	Meter Loss Compensation	Line Losses included in the Meter				Y			
6-Device and Qualification	6	22	Meter Manufacturer	Manufacturer of the Meter				Y			
6-Device and Qualification	6	23	Meter Model	Model of the Meter				Y			
6-Device and Qualification	6	25	Meter Multiplier (kH)	Multiplier used to convert pulses into power units				Y			
6-Device and Qualification	6	2295	Meter Owner	Owner of the Meter				Y			
6-Device and Qualification	6	29	Meter Phase	Specific Phase information				Y			
6-Device and Qualification	6	229	Meter Qualification Date	Date of Qualification of the Meter by the Metering Authority or System Operator				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	24	Meter Rating	Load Rating of the Meter				Y			
6-Device and Qualification	6	225	Meter Test Criteria	Test Criteria required to qualify the installation of the Meter				Y			
6-Device and Qualification	6	226	Meter Test Frequency	Frequency of Tests of the Meter	Expressed in months.			Y			
6-Device and Qualification	6	229 1	Meter Test Results	Results of Tests of the Meter	These are specific to the meter type.			Y			
6-Device and Qualification	6	21	Meter Type	Type of Meter installed at the Facility	Examples: RTU, CT/PT, etc.			Y			
8-Offer Parameters	8	21	Min Gen MW	Minimum MW available for dispatch	When required as part of an enrollment request, this value acts as a default.			Y			Y
8-Offer Parameters	8	22	Min Gen Cost	The cost per hour for each Min Gen MW value.	The cost per hour for each MinGenMW value.			Y			Y
11-Capacity Market	11	40	Minimum Payment Nomination	Strike price for the economic dispatch of the energy component of the capacity program	Expressed in Price/MW.			Y			
6-Device and Qualification	6	31	Nameplate Rating	Manufacturer's output rating of the Distributed Generator				Y			
0-Common Message Parameters	0	20	NERC CIP Security - Availability	CIP Security Classification for Availability				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
0-Common Message Parameters	0	21	NERC CIP Security - Confidentiality	CIP Security Classification for Confidentiality				Y			
0-Common Message Parameters	0	22	NERC CIP Security - Integrity	CIP Security Classification for Integrity				Y			
2-Location	2	60	NERC Control Area	The NERC control area of the resource				Y			
11-Capacity Market	11	23	Nominal Capacity	Nominated load	Expressed as a decimal value.			Y			Y
6-Device and Qualification	6	44	Normal Breaker Status	Status of the Breaker for the Service Location under Normal operating conditions	Normal Operations is the time following Release/Recall during which a System Operator or Service Provider may require a Demand Resource to have returned its Load consumption to normal levels and to be available again for Deployment.			Y			
6-Device and Qualification	6	38	Normal Load Rating	Average load picked up by the Distributed Generator during the applicable performance hours				Y			
12-Event and Performance	12	111	Notification Acknowledgement	This is an acknowledgement of the receipt of a DR notification or dispatch. It should include any necessary provisions for non-repudiation.				Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	38	Offer Commit Status	Commitment status of offer	Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc.			Y			Y
8-Offer Parameters	8	39	Offer Dispatch Status	Dispatch Status of Offer	Product-specific commitment status types included with offer. Examples include: economic, emergency, not participating, not qualified, and self-schedule. May also be used to temporarily opt out of DR Events and to override the normal operational constraints. The opt-out can be specified using the following criteria: • All events in a program indefinitely (unspecified time period) • Specific DR Event • All events in a specific time period. • Other triggered programs for which an asset or DR resource is already called upon (reduce double counting of available capacity)			Y			Y
8-Offer Parameters	8	30	Offer Dispatch Type	Type of Offer	Examples are Flexible (resource follows basepoint signals) or Fixed (resource requests DA commitment and RT schedules of 15 minutes or greater)			Y			
8-Offer Parameters	8	36	Offer Expiration Date	Date of Expiration of the Offer	This applies to DAM only.			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	12	Offer Limit Interval	Offer Limit Interval	The period over which the offer limit applies, i.e., hour, day, etc.			Y			Y
8-Offer Parameters	8	11	Offer Limit Type	Type of Offer Limit	The limit may be associated with the bidding parameters of a resource. These may include limit types such as seasonal rating, reasonability, economic and ramp limits.			Y			Y
8-Offer Parameters	8	10	Offer Limit Value	Offer Limit Value	Expressed in MW or hours. Multiple Limit Types ~~are~~ <u>may be</u> applicable.			Y			Y
8-Offer Parameters	8	331	Offer Price Curve Slope	Flag to smooth offer segments from step function to slope				Y			
8-Offer Parameters	8	33	Offer Segment Hour	Hour of Segment of the Offer	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
8-Offer Parameters	8	31	Offer Segment MW	Energy of Segment of the Offer	The end value of the offer step, monotonically increasing, expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)			Y			
8-Offer Parameters	8	32	Offer Segment Price	Price of Segment of the Offer	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
12-Event and Performance	12	15	Operator Comment	Additional Event information provided by the Operator				Y			
9-Energy Market	9	23	Output MVAR	Reactive Power Output of the Distributed Generator	Expressed in Mvar			Y			
9-Energy Market	9	22		Real Power Output of the Distributed Generator	Expressed in MW			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
			Output MW								
14-Price and Product	14	30	Override Unit of Measure	Optional Attribute of Price object If this is used, then Unit of Measure is not applicable		Y					
6-Device and Qualification	6	11	Parent ~~Meter~~ idMeter ID	Flag set if the Meter is a Master or Parent Meter				Y			
11-Capacity Market	11	22	Peak Date/Time	Date and Time of measurement of Peak				Y			
11-Capacity Market	11	21	Peak Type	Type of measurement of Peak	Examples are: Annual, Monthly, Weekly, and Seasonal.			Y			
11-Capacity Market	11	20	Peak Value	Measurement of Peak				Y			
7-Market / Program Enrollment	7	51	Performance Evaluation Method	Method used to Evaluate the Performance of a Resource	Based on NAESB M&V terms.			Y			
7-Market / Program Enrollment	7	50	Performance Evaluation Method Type Code	Code representing the Type of Measurement				Y			
8-Offer Parameters	8	20	Physical Min Gen	Minimum Operating Level of a Resource				Y			Y
2-Location	2	43	PNode	Name of the Price Node associated with the Service Location	The P-Node is the price location of the Service Location in the transmission and/or distribution network.			Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	44	PNode ID	Identifier assigned to the Price Node associated with the Service Location				Y			Y
8-Offer Parameters	8	50	Portfolio Name	Name of an aggregation of Resources for market participation				Y			
14-Price and Product	14	33	Price Component Type	The portion of the price to which the corresponding value applies.	Examples: Energy, congestion, losses	Y					
14-Price and Product	14	34	Price Component Value	The value of the price component.		Y					
14-Price and Product	14	35	Price Location	The location at which the price is applicable.		Y					
14-Price and Product	14	36	Price Type	Time characteristic of the price	The type of price (day-ahead, real-time, etc.).	Y					
6-Device and Qualification	6	47	Private Use Network	Flag set if the Resource is an Electric Network connected to the transmission grid	This is used for load that is typically netted with internal generation.			Y			
14-Price and Product	14	20	Product Identifier	Identifies specific product associated with the price		Y			Y		
14-Price and Product	14	10	Product Name	Same as 7.13 Market Product	An identifier for a particular electricity product offering: energy, capacity, ancillary services, etc.	Y					
14-Price and Product	14	31	Product Price	The sum of all Price Component Values for a given product (Total Price).		Y					Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
14-Price and Product	14	32	Product Price Factor	Terms of use attribute of Product Price	Examples: Price_absolute, Price_relative, Price_multiplier	Y			Y		
14-Price and Product	14	12	Product Sub-type	Used to further define product types		Y			Y		
14-Price and Product	14	11	Product Type	Defines the source and product	Classifications used within industry for trading energy. Examples: PJM Energy, NYISO 10-min Spin, etc.	Y					Y
7-Market / Program Enrollment	7	10	Program ID	Program Identifier	The identifier of the program			Y			Y
7-Market / Program Enrollment	7	11	Program Name	Name of the Program				Y			Y
6-Device and Qualification	6	222	PT Ratio	Ratio of the Potential Transformer				Y			
11-Capacity Market	11	24	Qualified Capacity	Nominal ~~ICAP~~ <u>installed capacity (ICAP)</u> derated for performance	Derated based on past performance.			Y			Y
8-Offer Parameters	8	25	Ramp Rate Direction	Direction of the selected Ramp Rate Type and Ramp Rate Segment	Valid directions are: Upward, Downward, Both.			Y			Y
8-Offer Parameters	8	24	Ramp Rate Segment	Energy of Segment of the Ramp Rate	The end value of the Ramp Rate step, monotonically increasing or decreasing (as indicated by the Ramp Rate Direction), expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)			Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	23	Ramp Rate Type	Type of Ramp Rate	Examples are: Normal, Emergency, Regulation.			Y			Y
8-Offer Parameters	8	26	Ramp Rate Value	Ramp Rate associated with the selected Ramp Rate Type for the selected Ramp Rate Segment and Ramp Rate Direction	The NERC definition of Ramp Rate is the rate, expressed in megawatts per minute, by which a generator changes its output. For a Demand Resource, the Ramp Rate is the rate, expressed in megawatts per minute, by which a Demand Resource changes its Load.			Y			Y
7-Market / Program Enrollment	7	32	Real Time Flag	Flag set if the Resource will be participating in the Real-Time market				Y			
10-Ancillary Service Market	10	32	Regulation Base Point	Per-interval Regulation dispatch instruction	Regulation Service is a type of Demand Response service in which a Demand Resource corrects for short-term changes in electricity use that might affect the stability of the power system, matching generation and load to maintain a desired frequency. Demand Resources providing Regulation Service are subject to dispatch continuously during a commitment period. Provision of Regulation Service does not correlate to Demand Response deployment terms of the Event timelines, deadlines and durations.			Y			
0-Common Message Parameters	0	13	Rejection Code Type	Type of rejection message	Rejection code type is categorizing the different kinds of rejection messages associated with enrollment, qualification, offers or meter data. May be combined with comments to provide details beyond the type of rejection.			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
0-Common Message Parameters	0	14	Rejection Code Value	Code referring to the reason for a rejection message	Rejection code related to the type of rejection. May be combined with comments to provide details beyond the type of rejection.			Y			
12-Event and Performance	12	30	Reporting Interval	Interval size required for Reporting				Y			Y
10-Ancillary Service Market	10	24	Requalification Requirement	Flag set if Requalification is Required				Y			
7-Market / Program Enrollment	7	26	Requalification Test Date	Date the Resource will retest its ability to deliver a product or service				Y			Y
10-Ancillary Service Market	10	31	Reserve Pickup Flag	Flag set if this is a Reserve Pickup schedule	Reserve Service is a type of Demand Response service in which Demand Resources are obligated to be available to provide Demand reduction Energy Service, based on reserve capacity requirements that are established to meet applicable reliability standards. Reserve Services are defined by short-term response rates (Ramp Period) and synchronization with the electricity grid (i.e., spinning and non-spinning reserves).			Y			
1-General Asset / Resource	1	20	Resource ID	Identifier assigned to the Resource	A Resource may be an individual asset or a group of assets that represent a dispatchable entity.			Y			Y
1-General Asset / Resource	1	21	Resource Name	Name of the Resource				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	24	Resource Qualification Test Date	Date the Resource demonstrated its ability to deliver a product or service				Y			Y
7-Market / Program Enrollment	7	23	Resource Type	Type of Resource	Examples are: load reduction <u>or response</u> (curtailable or interruptible load), distributed generation, combination, renewable, storage, etc.			Y			Y
7-Market / Program Enrollment	7	41	Response Method ID	Identifier assigned to the Response Method				Y			
7-Market / Program Enrollment	7	42	Response Method Name	Name of the Response Method				Y			
7-Market / Program Enrollment	7	40	Response Method Type	Type of Response Method	Expressed as a response type code			Y			
7-Market / Program Enrollment	7	43	Response Method Value	Value of the Response Method	The Demand Response Value is the quantity of modified electrical consumption by a Demand Resource, expressed as MW.			Y			
7-Market / Program Enrollment	7	34	Response Time	The amount of time before an asset/resource is capable of meeting its full performance, in response to a request by a Service Provider to shed load <u>or produce energy</u> .							Y

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12-Event and Performance	12	33	Response Value	Response				Y			Y
5-Business Entity Relationships	5	44	Retail Rate	Retail Rate	Expressed as Price per kWh <u>*[Why are these retail items (40-44) checked Y for wholesale and unchecked for retail?]</u>			Y			
5-Business Entity Relationships	5	41	Retail Rate Code	Code representing the Retail Rate for the Service Location	<u>*</u>			Y			
5-Business Entity Relationships	5	43	Retail Rate Description	Description of the Retail Rate	<u>*</u> This can also be used for comments associated with the Retail Rate.			Y			
5-Business Entity Relationships	5	40	Retail Rate ID	Identifier assigned to the Retail Rate	<u>*</u>			Y			
5-Business Entity Relationships	5	42	Retail Rate Name	Name of the Retail Rate for the Service Location	<u>*</u>			Y			
8-Offer Parameters	8	42	Schedule Description	Description of the Offer				Y			
9-Energy Market	9	15	Schedule ID	<u>-Unique identifier assigned to each schedule.</u>	<u>Unique identifier assigned to each schedule.</u>			Y			
8-Offer Parameters	8	41	Schedule Name	Name or tag of the Offer				Y			
8-Offer Parameters	8	43	Schedule Status	Status of the Offer				Y			

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5-Business Entity Relationships	5	70	Scheduling Entity ID	Identifier assigned to the Scheduling Entity	A Scheduling Entity submits bids and/or offers and receives Schedules and Awards.			Y			
5-Business Entity Relationships	5	71	Scheduling Entity Name	Name of the Scheduling Entity				Y			
7-Market / Program Enrollment	7	33	Self-Schedule Flag	Flag set if the Resource is Self-Deploying	Self-Deployment is the Deployment via established Communication Methods initiated by the Service Provider <u>Is this a defined term for WEQ and REQ?</u> or the Resource.			Y			
1-General Asset / Resource	1	10	Service Location ID	Identifier assigned to the Service Location	The location at which connection to the transmission or distribution system is made.			Y			Y
1-General Asset / Resource	1	11	Service Location Name	Name of the Service Location				Y			
5-Business Entity Relationships	5	11	Service Provider ID	Identifier assigned to the Service Provider	The Service Provider coordinates Resources to deliver electricity products and services to a market or distribution operator.			Y			Y
5-Business Entity Relationships	5	12	Service Provider Name	Name of the Service Provider				Y			

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9-Energy Market	9	25	Set Point	Final dispatch target level	The real-time desired MW output signal calculated for a specific Resource by the Transmission Provider's control system on a specified periodicity that is equal to the current Energy Dispatch Target plus the Regulating Reserve Deployment instruction (which may be positive or negative) plus an adjustment to the Energy Dispatch Target to account for Contingency Reserve Deployment Instructions. The Setpoint Instruction represents the desired output level of the Resource.			Y			
12-Event and Performance	12	50	Simple Signal Levels	Used as an alternate and simplified representation of the DR signal, whether it be price based or a dispatch. Takes on a small number of finite levels such as NORMAL, MODERATE, and HIGH, SPECIAL							Y
14-Price and Product	14	40	Source Location Identifier	The identifier of the source location of the product for which the price applies		Y			Y		
14-Price and Product	14	41	Source Location Identifier Type	The type of source location of the product for which the price applies		Y					
8-Offer Parameters	8	34	Startup Cost	Cost of starting a response activity	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			

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For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	37	Startup Cost Type	Type of startup cost	The type of Start Up Cost included in the offer. Options may include: Select cold, intermediate, hot or shutdown.			Y			
2-Location	2	13	State/Province	State or Province two-letter code				Y			Y
13-Direct Load Control	13	10	Status Check	A signal to require the DR resource status to be sent back. (Only applicable to Direct Load Control)							Y
8-Offer Parameters	8	35	Strike Price	Threshold Price	Expressed as a decimal value of price/MW.			Y			
8-Offer Parameters	8	332	Strike Price Type	Type of strike price	Indicates the type of strike price. Options may include: buy or sell.			Y			
0-Common Message Parameters	0	10	Submittal Date	Timestamp for the sender's use				Y			
0-Common Message Parameters	0	11	Submitted By	User ID of submitter	Common data element to indicate the user ID of the entity submitting the data			Y			
0-Common Message Parameters	0	12	Submitted Error	ID of submission error detected	Common data element to capture any errors or exceptions during submission			Y			
10-Ancillary Service Market	10	21	Synchronization Test Date	Target Date of Test of Synchronization to the grid				Y			
3-Contact	3	13	Third Party	Flag set if the Contact is a				Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
				third-party entity							
2-Location	2	22	Time Zone Name	Name of the Time Zone in which the Service Location is located				Y			
3-Contact	3	20	Title	Title of the Contact				Y			
5-Business Entity Relationships	5	22	Transmission / Distribution Service Provider Account Number	Transmission / Distribution Service Provider's account number for the Resource				Y			Y
5-Business Entity Relationships	5	20	Transmission / Distribution Service Provider ID	Identifier assigned to the Transmission / Distribution Service Provider	The Transmission / Distribution Service Provider operates a local electricity transmission and/or distribution system.			Y			
5-Business Entity Relationships	5	21	Transmission / Distribution Service Provider Name	Name of the Transmission / Distribution Service Provider				Y			
6-Device and Qualification	6	51	UFR Settings	Setting of the Under-Frequency Relay				Y			
14-Price and Product	14	14	Unit of Measure	Attribute of Product Identifier		Y					Y
12-Event and Performance	12	52	Usage Information	Information about the near real time electricity usage of the DR Resource.							Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	229 2	VEE Compliance	Compliance standard for Validation, Editing, and Estimation	Validation, Editing, and Estimation is the process of taking raw meter data and performing validation and, as necessary, editing and estimation of corrupt or missing data, to create validated data. VEE guidelines are published in the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering, Volume Two, Published 12/05/00, http://www.naesb.org/REQ/req_form.asp .			Y			
7-Market / Program Enrollment	7	44	Verified Capability	Audited Capability	Auditing is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods AFTER the Enrollment process.			Y			
7-Market / Program Enrollment	7	45	Verified Capability Factor	Ratio of the Verified Capability to the qualified capability	Qualification is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods DURING the Enrollment process.			Y			
2-Location	2	21	Weather Station	Weather Station code associated with the Service Location				Y			Y
6-Device and Qualification	6	46	Wholesale Delivery Point Status	Flag set if the Service Location is metered at the Wholesale level				Y			
2-Location	2	14	Zip/Postal Code	Zip or Postal Code				Y			Y
2-Location	2	31	Zone	Name of the Zone in which the Service Location is located	A Zone is a physical or electrical region.			Y			Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	30	Zone ID	Identifier assigned to the Zone in which the Service Location is located				Y			Y
2-Location	2	32	Zone Type	Type of Zone	Examples: Capacity, Dispatch, Price, Load, etc.			Y			

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REQ-020.1.2 Listing by Category ID and Category Element ID

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
0-Common Message Parameters	0		Common Message Parameters								
0-Common Message Parameters	0	10	Submittal Date	Timestamp for the sender's use				Y			
0-Common Message Parameters	0	11	Submitted By	User ID of submitter	Common data element to indicate the user ID of the entity submitting the data			Y			
0-Common Message Parameters	0	12	Submitted Error	ID of submission error detected	Common data element to capture any errors or exceptions during submission			Y			
0-Common Message Parameters	0	13	Rejection Code Type	Type of rejection message	Rejection code type is categorizing the different kinds of rejection messages associated with enrollment, qualification, offers or meter data. May be combined with comments to provide details beyond the type of rejection.			Y			
0-Common Message Parameters	0	14	Rejection Code Value	Code referring to the reason for a rejection message	Rejection code related to the type of rejection. May be combined with comments to provide details beyond the type of rejection.			Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
0-Common Message Parameters	0	20	NERC CIP Security - Availability	CIP Security Classification for Availability				Y			
0-Common Message Parameters	0	21	NERC CIP Security - Confidentiality	CIP Security Classification for Confidentiality				Y			
0-Common Message Parameters	0	22	NERC CIP Security - Integrity	CIP Security Classification for Integrity				Y			
1-General Asset / Resource	1		General Asset/Resource								
1-General Asset / Resource	1	10	Service Location ID	Identifier assigned to the Service Location	The location at which connection to the transmission or distribution system is made.			Y			Y
1-General Asset / Resource	1	11	Service Location Name	Name of the Service Location				Y			
1-General Asset / Resource	1	12	Asset ID	The unique identifier of the asset				Y			Y
1-General Asset / Resource	1	13	Asset Name	The name of the asset				Y			
1-General Asset / Resource	1	20	Resource ID	Identifier assigned to the Resource	A Resource may be an individual asset or a group of assets that represent a dispatchable entity.			Y			Y
1-General Asset / Resource	1	21	Resource Name	Name of the Resource				Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
1-General Asset / Resource	1	22	DR Resource Group ID	Grouping of Resources that can respond to the same DR signal							Y
1-General Asset / Resource	1	30	Asset Group ID	The identifier of a group of assets	An Asset Group is a logical entity that has a reportable interval-level consumption.			Y			Y
1-General Asset / Resource	1	31	Asset Group Name	Name of the aggregated group of assets				Y			Y
1-General Asset / Resource	1	40	Gen_EMS_ID	Alias or point Identifier assigned to the Resource				Y			
1-General Asset / Resource	1	41	Gen_Billing_ID	Billing Identifier assigned to the Resource				Y			
1-General Asset / Resource	1	50	Business Segment	SIC or NAICS code of the Service Location				Y			
1-General Asset / Resource	1	51	Batch Load Flag	Flag set if the Resource is a Batch Load				Y			
1-General Asset / Resource	1	991	General Resource Comments	General comments associated with the Resource				Y			
2-Location	2		Location								
2-Location	2	10	Address1	Address line 1				Y			Y
2-Location	2	11	Address2	Address line 2				Y			Y
2-Location	2	12	City	City				Y			Y
2-Location	2	13	State/Province	State or Province two-letter code				Y			Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	14	Zip/Postal Code	Zip or Postal Code				Y			Y
2-Location	2	15	Country	Country				Y			Y
2-Location	2	20	GPS Coordinates	Latitude and longitude				Y			Y
2-Location	2	21	Weather Station	Weather Station code associated with the Service Location				Y			Y
2-Location	2	22	Time Zone Name	Name of the Time Zone in which the Service Location is located				Y			
2-Location	2	30	Zone ID	Identifier assigned to the Zone in which the Service Location is located				Y			Y
2-Location	2	31	Zone	Name of the Zone in which the Service Location is located	A Zone is a physical or electrical region.			Y			Y
2-Location	2	32	Zone Type	Type of Zone	Examples: Capacity, Dispatch, Price, Load, etc.			Y			
2-Location	2	40	Electrical Node ID	Identifier assigned to the Electrical Node at which the Service Location is connected				Y			Y
2-Location	2	41	Electrical Node Name	Name of the Electrical Node at which the Service Location is connected				Y			Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	42	Electrical Node Type	Type of Electrical Node at which the Service Location is attached				Y			Y
2-Location	2	43	PNode	Name of the Price Node associated with the Service Location	The P-Node is the price location of the Service Location in the transmission and/or distribution network.			Y			Y
2-Location	2	44	PNode ID	Identifier assigned to the Price Node associated with the Service Location				Y			Y
2-Location	2	50	Competitive Choice Area	Flag set if the Service Location is in an area with Competitive Choice				Y			
2-Location	2	51	Asset Multiplier	Number of identical Assets within the Service Location				Y			
2-Location	2	60	NERC Control Area	The NERC control area of the resource				Y			
2-Location	2	71	Connection Type	Additional type of connection associated with the Service Delivery Point	Example: ICCP Connection, IP address			Y			
2-Location	2	72	Connection Address	Address associated with the Connection Type	Example: Address of ICCP Connection, IP address			Y			
2-Location	2	991	Location Comments	Comments associated with the Service Location				Y			
3-Contact	3		Contact								

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
3-Contact	3	10	Contact Type	Interest code associated with a Contact	This is a classification defining the function a particular contact serves. It supports "who to call for what needs" decisions. Examples are: Primary, Secondary, Billing, Third Party, and Authorized Representative.			Y			
3-Contact	3	11	Contact Priority	Order in which this Contact should be selected	This is used when multiple contacts are defined.			Y			
3-Contact	3	12	DUNS Number	DUNS business number				Y			
3-Contact	3	13	Third Party	Flag set if the Contact is a third-party entity				Y			
3-Contact	3	20	Title	Title of the Contact				Y			
3-Contact	3	21	First Name	First Name of the Contact				Y			
3-Contact	3	22	Last Name	Last Name of the Contact				Y			
3-Contact	3	23	Contact Middle Name	Middle Name of the Contact				Y			
3-Contact	3	30	Contact Method	Method of communication with the Contact	This identifies the various types of communication options (phone, email, etc.) which may be used.			Y			
3-Contact	3	31	Contact Address Data	Method-dependent Address of the Contact	This identifies specific information required for the contact method selected.			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
3-Contact	3	32	Contact Method Priority	Order in which a Communication Method should be selected for a Contact	A Communication Method is the medium by which an object communicates with another object for instruction, measurement, or control. The user specifies the sequence in which each medium is to be used when being contacted.			Y			
3-Contact	3	991	Contact Comments	Comments associated with the Contact				Y			
4-Grid Connection	4		Grid Connection								
4-Grid Connection	4	10	Loss Factor Type	Type of Loss Factor				Y			
4-Grid Connection	4	11	Loss Factor Value	Loss Factor	Expressed as a decimal value.			Y			
4-Grid Connection	4	12	Connect Voltage	Voltage level	Voltage at connection.			Y			
4-Grid Connection	4	991	Grid Connection Comments	Comments associated with the Grid Connection of the Resource				Y			
5-Business Entity Relationships	5		Business Entity Relationships								
5-Business Entity Relationships	5	11	Service Provider ID	Identifier assigned to the Service Provider	The Service Provider coordinates Resources to deliver electricity products and services to a market or distribution operator.			Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	12	Service Provider Name	Name of the Service Provider				Y			
5-Business Entity Relationships	5	13	Demand Response Provider	<u>-The entity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response products.</u>	<u>The entity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response products.</u>						Y
5-Business Entity Relationships	5	14	Demand Response Controlling Entity	<u>An identifier for the Service Provider issuing the DR event deployment instructions.-</u>	<u>An identifier for the Service Provider issuing the DR event deployment instructions.</u>						Y
5-Business Entity Relationships	5	20	Transmission / Distribution Service Provider ID	Identifier assigned to the Transmission / Distribution Service Provider	The Transmission / Distribution Service Provider operates a local electricity transmission and/or distribution system.			Y			
5-Business Entity Relationships	5	21	Transmission / Distribution Service Provider Name	Name of the Transmission / Distribution Service Provider				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	22	Transmission / Distribution Service Provider Account Number	Transmission / Distribution Service Provider's account number for the Resource				Y			Y
5-Business Entity Relationships	5	30	Load Serving Entity ID	Identifier assigned to the LSE	The Load-Serving Entity serves end users and sells electric energy to end users.			Y			
5-Business Entity Relationships	5	31	Load Serving Entity Name	Name of the LSE				Y			
5-Business Entity Relationships	5	40	Retail Rate ID	Identifier assigned to the Retail Rate	<u>*[Why are these retail items (40-44) checked Y for wholesale and unchecked for retail?]</u>			Y			
5-Business Entity Relationships	5	41	Retail Rate Code	Code representing the Retail Rate for the Service Location	<u>*</u>			Y			
5-Business Entity Relationships	5	42	Retail Rate Name	Name of the Retail Rate for the Service Location	<u>*</u>			Y			
5-Business Entity Relationships	5	43	Retail Rate Description	Description of the Retail Rate	<u>*</u> This can also be used for comments associated with the Retail Rate.			Y			
5-Business Entity Relationships	5	44	Retail Rate	Retail Rate	<u>*</u> Expressed as Price per kWh			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	50	Meter Installation Provider ID	Identifier assigned to the Meter Installation Provider				Y			
5-Business Entity Relationships	5	51	Meter Installation Provider Name	Name of the Meter Installation Provider	This is the ~~competitive~~ -meter entity for the meter device.			Y			
5-Business Entity Relationships	5	60	Meter Authority ID	Identifier assigned to the Metering Authority	The Metering Authority provides electric usage data necessary to determine the performance of a Resource.			Y			
5-Business Entity Relationships	5	61	Meter Authority Name	Name of the Metering Authority				Y			
5-Business Entity Relationships	5	70	Scheduling Entity ID	Identifier assigned to the Scheduling Entity	A Scheduling Entity submits bids and/or offers and receives Schedules and Awards.			Y			
5-Business Entity Relationships	5	71	Scheduling Entity Name	Name of the Scheduling Entity				Y			
5-Business Entity Relationships	5	80	Designated Dispatch Entity ID	Identifier assigned to the Designated Dispatch Entity	The Designated Dispatch Entity receives and processes Demand Resource Dispatch instructions or market information and may provide response information.			Y			
5-Business Entity Relationships	5	81	Designated Dispatch Entity Name	Name of the Designated Dispatch Entity				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	90	Asset Operator ID	The identifier of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.							Y
5-Business Entity Relationships	5	91	Asset Operator Name	The name of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.							Y
5-Business Entity Relationships	5	92	Asset Owner ID	The Identifier of the business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).							Y
5-Business Entity Relationships	5	93	Asset Owner Name	The Name of business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).							Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	991	External Entity Comments	Comments associated with the External Entity				Y			
6-Device and Qualification	6		Device and Qualification								
6-Device and Qualification	6	10	Meter Configuration	Configuration of the Meter at the Facility	The CIM defines the ~~Meter~~ as the physical asset that performs the metering role of the ServiceDeliveryPoint. It is used for measuring consumption and detecting events.			Y			
6-Device and Qualification	6	11	Parent ~~Meter~~ idMeter ID	Flag set if the Meter is a Master or Parent Meter				Y			
6-Device and Qualification	6	20	Meter ID	Identifier assigned to the Meter				Y			
6-Device and Qualification	6	21	Meter Type	Type of Meter installed at the Facility	Examples: RTU, CT/PT, etc.			Y			
6-Device and Qualification	6	22	Meter Manufacturer	Manufacturer of the Meter				Y			
6-Device and Qualification	6	221	Meter Installation Date	Date of Installation of the Meter				Y			
6-Device and Qualification	6	222	PT Ratio	Ratio of the Potential Transformer				Y			
6-Device and Qualification	6	223	Meter Installer License	Professional License Number of the Installer of the Meter	~~[Are these Meter elements correctly checked Y for Wholesale but not for Retail?]~~			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	224	Meter Correction Factors	Device-specific Factors used to adjust for atmospheric changes at the point of installation of the Meter				Y			
6-Device and Qualification	6	225	Meter Test Criteria	Test Criteria required to qualify the installation of the Meter				Y			
6-Device and Qualification	6	226	Meter Test Frequency	Frequency of Tests of the Meter	Expressed in months.			Y			
6-Device and Qualification	6	227	Meter Device QA Plan	Quality Assurance plan for maintenance and testing of the Meter				Y			
6-Device and Qualification	6	228	Date of Last Meter Test	Date of Last Test of the Meter				Y			
6-Device and Qualification	6	229	Meter Qualification Date	Date of Qualification of the Meter by the Metering Authority or System Operator				Y			
6-Device and Qualification	6	229 1	Meter Test Results	Results of Tests of the Meter	These are specific to the meter type.			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	229 2	VEE Compliance	Compliance standard for Validation, Editing, and Estimation	Validation, Editing, and Estimation is the process of taking raw meter data and performing validation and, as necessary, editing and estimation of corrupt or missing data, to create validated data. VEE guidelines are published in the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering, Volume Two, Published 12/05/00, http://www.naesb.org/REQ/req_form.asp .			Y			
6-Device and Qualification	6	229 3	Measurement Interval	Interval of time between Measurement readings	This is the time between electricity meter recordings. The Measurement records the consumption or supply of an End Device. An End Device is a physical end-use device that consumes or supplies electricity.			Y			
6-Device and Qualification	6	229 4	ANSI Compliance	ANSI standard with which the Meter complies				Y			
6-Device and Qualification	6	229 5	Meter Owner	Owner of the Meter				Y			
6-Device and Qualification	6	229 6	Meter Asset Comments	Comments associated with the Meter Asset				Y			
6-Device and Qualification	6	23	Meter Model	Model of the Meter				Y			
6-Device and Qualification	6	24	Meter Rating	Load Rating of the Meter				Y			

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For Quadrant: REQ
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Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	25	Meter Multiplier (kH)	Multiplier used to convert pulses into power units				Y			
6-Device and Qualification	6	26	Meter Accuracy Class	Accuracy Class of the Meter				Y			
6-Device and Qualification	6	27	Meter Loss Compensation	Line Losses included in the Meter				Y			
6-Device and Qualification	6	28	Maximum Error	Error of the Meter, including end-to-end Maximum Error				Y			
6-Device and Qualification	6	29	Meter Phase	Specific Phase information				Y			
6-Device and Qualification	6	291	CT Ratio	Ratio of the Current Transformer				Y			
6-Device and Qualification	6	30	Distributed Generator Type	Type of Distributed Generator	This technology characteristic of the Distributed Generator, such as combined cycle, induction, etc.			Y			
6-Device and Qualification	6	31	Nameplate Rating	Manufacturer's output rating of the Distributed Generator				Y			
6-Device and Qualification	6	32	Distributed Generator Fuel Type	Type of Fuel consumed by the Distributed Generator				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	33	Distributed Generator Permit Type	Type of environmental authorization required to operate the Distributed Generator	The Environmental Authority is a regulatory authority responsible for the development, reporting, and enforcement of environmental activities.			Y			
6-Device and Qualification	6	34	Distributed Generator Manufacturer	Manufacturer of the Distributed Generator				Y			Y
6-Device and Qualification	6	35	Manufactured Date of Distributed Generator	Date of Manufacturer of the Distributed Generator				Y			Y
6-Device and Qualification	6	36	Installation Date of Distributed Generator	Date of Installation of the Distributed Generator				Y			
6-Device and Qualification	6	37	In-Service Date	Date the Distributed Generator became operational				Y			
6-Device and Qualification	6	38	Normal Load Rating	Average load picked up by the Distributed Generator during the applicable performance hours				Y			
6-Device and Qualification	6	39	Distributed Generator Name	Name of the Distributed Generator				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	41	Interconnection Agreement Type	Type of Interconnection Agreement between the Distributed Generator or Service Location and the TDSP				Y			
6-Device and Qualification	6	42	Interconnection Limits	Limits associated with the Interconnection of the Distributed Generator or Service Location				Y			
6-Device and Qualification	6	43	Capable of Synchronizing to Grid	Flag set if the Service Location is capable of Synchronizing to the Grid				Y			
6-Device and Qualification	6	44	Normal Breaker Status	Status of the Breaker for the Service Location under Normal operating conditions	Normal Operations is the time following Release/Recall during which a System Operator or Service Provider may require a Demand Resource to have returned its Load consumption to normal levels and to be available again for Deployment.			Y			
6-Device and Qualification	6	45	Breaker Status During Event	Status of the Breaker for the Service Location during an Emergency Event				Y			
6-Device and Qualification	6	46	Wholesale Delivery Point Status	Flag set if the Service Location is metered at the Wholesale level				Y			
6-Device and Qualification	6	47	Private Use Network	Flag set if the Resource is an Electric Network connected to the	This is used for load that is typically netted with internal generation.			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
				transmission grid							
6-Device and Qualification	6	51	UFR Settings	Setting of the Under-Frequency Relay				Y			
6-Device and Qualification	6	52	Load Resource Control Device	Type of Control Device at a Service Location or deployed by a Response Method				Y			
6-Device and Qualification	6	70	Device Class		Note: From SEP2.0 Enumeration representing the Device Class to apply the current Load Control Event. 0 HVAC compressor or furnace 1 Strip Heaters/Baseboard Heaters 2 Water Heater 3 Pool Pump/Spa/Jacuzzi 4 Smart Appliances 5 Irrigation Pump 6 Managed Commercial & Industrial (C&I) loads 7 Simple misc. (Residential On/Off) loads 8 Exterior Lighting 9 Interior Lighting 10 Electric Vehicle 11 Generation Systems 12 to 15 Reserved						Y
6-Device and Qualification	6	80	Asset Manufacturer	Manufacturer of the Asset							Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	81	Asset Model	Model identifier of the Asset, assigned by the Manufacturer							Y
6-Device and Qualification	6	82	Asset Version	Model version identifier, assigned by the Manufacturer							Y
6-Device and Qualification	6	83	Asset Manufacture Date	Date of Manufacture of the Asset							Y
6-Device and Qualification	6	84	Asset Type	Type of Asset	Examples are: load reduction <u>or response</u> (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.						Y
6-Device and Qualification	6	991	Distributed Generator Comments	Comments associated with the Distributed Generator				Y			
7-Market / Program Enrollment	7		Market/Program Enrollment								
7-Market / Program Enrollment	7	10	Program ID	Program Identifier	The identifier of the program			Y			Y
7-Market / Program Enrollment	7	11	Program Name	Name of the Program				Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	12	Market	Type of wholesale market				Y			
7-Market / Program Enrollment	7	13	Market Product	Market Product	Product types include the following: energy, capacity, regulation, operating reserves (spinning or non-spin).			Y			Y
7-Market / Program Enrollment	7	21	Effective Enrollment Date	Effective Start Date for the Enrollment	Market Enrollment is the collection of enrollment or tariff data for a Demand Resource to provide a specific market product or service.			Y			Y
7-Market / Program Enrollment	7	22	Enrollment Status	Status of the Enrollment for the Facility or Resource	Examples: Pending Enrollment, Approved Enrollment, Under Review, Denied, Separated			Y			Y
7-Market / Program Enrollment	7	23	Resource Type	Type of Resource	Examples are: load reduction <u>or response</u> (curtailable or interruptible load), distributed generation, combination, renewable, storage, etc.			Y			Y
7-Market / Program Enrollment	7	24	Resource Qualification Test Date	Date the Resource demonstrated its ability to deliver a product or service				Y			Y
7-Market / Program Enrollment	7	25	Enrollment End Date	Date of Termination of Enrollment				Y			Y
7-Market / Program Enrollment	7	26	Requalification Test Date	Date the Resource will retest its ability to deliver a product or service				Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	30	Lead Time	Time between the advanced notification and deployment	Notification is the transmittal of a Deployment message.			Y			Y
7-Market / Program Enrollment	7	31	Day Ahead Flag	Flag set if the Resource will be participating in the Day-Ahead market				Y			
7-Market / Program Enrollment	7	32	Real Time Flag	Flag set if the Resource will be participating in the Real-Time market				Y			
7-Market / Program Enrollment	7	33	Self-Schedule Flag	Flag set if the Resource is Self-Deploying	Self-Deployment is the Deployment via established Communication Methods initiated by the Service Provider <u>Is this a defined term for WEQ and REQ?</u> or the Resource.			Y			
7-Market / Program Enrollment	7	34	Response Time	The amount of time before an asset/resource is capable of meeting its full performance, in response to a request by a Service Provider to shed load <u>or produce energy.</u>							Y
7-Market / Program Enrollment	7	40	Response Method Type	Type of Response Method	Expressed as a response type code			Y			
7-Market / Program Enrollment	7	41	Response Method ID	Identifier assigned to the Response Method				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	42	Response Method Name	Name of the Response Method				Y			
7-Market / Program Enrollment	7	43	Response Method Value	Value of the Response Method	The Demand Response Value is the quantity of modified electrical consumption by a Demand Resource, expressed as MW.			Y			
7-Market / Program Enrollment	7	44	Verified Capability	Audited Capability	Auditing is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods AFTER the Enrollment process.			Y			
7-Market / Program Enrollment	7	45	Verified Capability Factor	Ratio of the Verified Capability to the qualified capability	Qualification is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods DURING the Enrollment process.			Y			
7-Market / Program Enrollment	7	50	Performance Evaluation Method Type Code	Code representing the Type of Measurement				Y			
7-Market / Program Enrollment	7	51	Performance Evaluation Method	Method used to Evaluate the Performance of a Resource	Based on NAESB M&V terms.			Y			
7-Market / Program Enrollment	7	991	Market Enrollment Comments	Comments associated with the Enrollment				Y			
8-Offer Parameters	8		Offer Parameters								

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	10	Offer Limit Value	Offer Limit Value	Expressed in MW or hours. Multiple Limit Types ~~are~~ <u>may be</u> applicable.			Y			Y
8-Offer Parameters	8	11	Offer Limit Type	Type of Offer Limit	The limit may be associated with the bidding parameters of a resource. These may include limit types such as seasonal rating, reasonability, economic and ramp limits.			Y			Y
8-Offer Parameters	8	12	Offer Limit Interval	Offer Limit Interval	The period over which the offer limit applies, i.e., hour, day, etc.			Y			Y
8-Offer Parameters	8	20	Physical Min Gen	Minimum Operating Level of a Resource				Y			Y
8-Offer Parameters	8	21	Min Gen MW	Minimum MW available for dispatch	When required as part of an enrollment request, this value acts as a default.			Y			Y
8-Offer Parameters	8	22	Min_Gen_Cost	The cost per hour for each Min Gen MW value.	The cost per hour for each MinGenMW value.			Y			Y
8-Offer Parameters	8	23	Ramp Rate Type	Type of Ramp Rate	Examples are: Normal, Emergency, Regulation.			Y			Y
8-Offer Parameters	8	24	Ramp Rate Segment	Energy of Segment of the Ramp Rate	The end value of the Ramp Rate step, monotonically increasing or decreasing (as indicated by the Ramp Rate Direction), expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)			Y			Y
8-Offer Parameters	8	25	Ramp Rate Direction	Direction of the selected Ramp Rate Type and Ramp Rate Segment	Valid directions are: Upward, Downward, Both.			Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	26	Ramp Rate Value	Ramp Rate associated with the selected Ramp Rate Type for the selected Ramp Rate Segment and Ramp Rate Direction	The NERC definition of Ramp Rate is the rate, expressed in megawatts per minute, by which a generator changes its output. For a Demand Resource, the Ramp Rate is the rate, expressed in megawatts per minute, by which a Demand Resource changes its Load.			Y			Y
8-Offer Parameters	8	30	Offer Dispatch Type	Type of Offer	Examples are Flexible (resource follows basepoint signals) or Fixed (resource requests DA commitment and RT schedules of 15 minutes or greater)			Y			
8-Offer Parameters	8	31	Offer Segment MW	Energy of Segment of the Offer	The end value of the offer step, monotonically increasing, expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)			Y			
8-Offer Parameters	8	32	Offer Segment Price	Price of Segment of the Offer	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
8-Offer Parameters	8	33	Offer Segment Hour	Hour of Segment of the Offer	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
8-Offer Parameters	8	34	Startup Cost	Cost of starting a response activity	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
8-Offer Parameters	8	35	Strike Price	Threshold Price	Expressed as a decimal value of price/MW.			Y			
8-Offer Parameters	8	36	Offer Expiration Date	Date of Expiration of the Offer	This applies to DAM only.			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	37	Startup Cost Type	Type of startup cost	The type of Start Up Cost included in the offer. Options may include: Select cold, intermediate, hot or shutdown.			Y			
8-Offer Parameters	8	38	Offer Commit Status	Commitment status of offer	Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc.			Y			Y
8-Offer Parameters	8	39	Offer Dispatch Status	Dispatch Status of Offer	Product-specific commitment status types included with offer. Examples include: economic, emergency, not participating, not qualified, and self-schedule. May also be used to temporarily opt out of DR Events and to override the normal operational constraints. The opt-out can be specified using the following criteria: • All events in a program indefinitely (unspecified time period) • Specific DR Event • All events in a specific time period. • Other triggered programs for which an asset or DR resource is already called upon (reduce double counting of available capacity)			Y			Y
8-Offer Parameters	8	331	Offer Price Curve Slope	Flag to smooth offer segments from step function to slope				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	332	Strike Price Type	Type of strike price	Indicates the type of strike price. Options may include: buy or sell.			Y			
8-Offer Parameters	8	40	Market Clearing Day	Market Clearing Day of the Offer				Y			
8-Offer Parameters	8	41	Schedule Name	Name or tag of the Offer				Y			
8-Offer Parameters	8	42	Schedule Description	Description of the Offer				Y			
8-Offer Parameters	8	43	Schedule Status	Status of the Offer				Y			
8-Offer Parameters	8	50	Portfolio Name	Name of an aggregation of Resources for market participation				Y			
8-Offer Parameters	8	71	Constraint Type	Type of operational, schedule or offer constraint	Types of operational, offer or schedule parameters. Examples include: Select Operational Minimum Runtime, Schedule Minimum Runtime, Operational Maximum Runtime, Schedule Maximum Runtime, Minimum Load, Maximum Load, Minimum Downtime, Minimum Starts, Maximum Energy, Maximum Starts, Time of Day schedule constraints, Black out date, Maximum consecutive days of participation, Maximum calls per day, Minimum Advanced Notification, Minimum duration of participation, etc.			Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	72	Constraint Interval	The timeframe over which the constraint type applies.	Typically daily, hourly, weekly, date			Y			Y
8-Offer Parameters	8	73	Constraint Value	Value of the Constraint Type and Interval				Y			Y
9-Energy Market	9		Energy Market								
9-Energy Market	9	0	Instruction ID	<u>Unique identifier assigned to each instruction.-</u>	<u>Unique identifier assigned to each instruction.-</u>			Y			
9-Energy Market	9	10	Energy Schedule - Start Time	Start Time of the Energy Schedule	A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).			Y			Y
9-Energy Market	9	11	Energy Schedule - End Time	End Time of the Energy Schedule	A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).			Y			
9-Energy Market	9	12	Energy Schedule - Interval Start Time	Start Time of the Energy Interval within the Energy Schedule	The start time of a specific energy schedule interval			Y			
9-Energy Market	9	13	Energy Schedule - Cleared MW Interval Value	The Energy Value of cleared MW for the Time Interval within the Energy Schedule	The offered energy MW that have cleared the market.			Y			
9-Energy Market	9	14	Energy Schedule - Cleared Price	Awarded Price	The market clearing price for the cleared energy MW.			Y			
9-Energy Market	9	15	Schedule ID	<u>-Unique identifier assigned to each schedule.</u>	<u>Unique identifier assigned to each schedule.</u>			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	20	Base Point	Per-interval dispatch instruction	A Dispatch is a real-time instruction to a Resource to move to a Base Point at a specific time (Resource-Specific Deployment) or a set of real-time instructions to multiple Resources (Bulk Deployment). A ~~Resource~~ Resource-Specific Deployment is the deployment, via established Communication Methods initiated by the System Operator, of one or more discrete and/or unique Resources designated to provide a selected service.			Y			
9-Energy Market	9	21	Breaker Status	Status of the Breaker for the Resource				Y			
9-Energy Market	9	22	Output MW	Real Power Output of the Distributed Generator	Expressed in MW			Y			
9-Energy Market	9	23	Output MVAR	Reactive Power Output of the Distributed Generator	Expressed in Mvar			Y			
9-Energy Market	9	24	DR Bus Load MW	Instantaneous Bus Load of a Demand Resource providing Ancillary Services	Demand is the rate at which electric energy is being used by the customer (NERC Definition). Expressed in MW. This element only applies to DR			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	25	Set Point	Final dispatch target level	The real-time desired MW output signal calculated for a specific Resource by the Transmission Provider's control system on a specified periodicity that is equal to the current Energy Dispatch Target plus the Regulating Reserve Deployment instruction (which may be positive or negative) plus an adjustment to the Energy Dispatch Target to account for Contingency Reserve Deployment Instructions. The Setpoint Instruction represents the desired output level of the Resource.			Y			
10-Ancillary Service Market	10		Ancillary Service Market								
10-Ancillary Service Market	10	0	Ancillary Service Instruction ID	<u>-Unique identifier assigned to each ancillary service instruction.</u>	<u>Unique identifier assigned to each ancillary service instruction.</u>			Y			
10-Ancillary Service Market	10	10	Ancillary Service Product Type	Type of Ancillary Service product(s) the Resource is enrolling to provide				Y			Y
10-Ancillary Service Market	10	11	Have Engineering Diagram	Flag set if One-Line Diagrams have been submitted				Y			
10-Ancillary Service Market	10	12	Ancillary Service Award - Start Time	Start Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.			Y			

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10-Ancillary Service Market	10	13	Ancillary Service Award - End Time	End Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.			Y			
10-Ancillary Service Market	10	14	Ancillary Service Award - Interval Start Time	Start Time of the ancillary service Interval within the ancillary service Award and the ancillary service Value of the Time Interval	The start time of a specific ancillary service schedule interval			Y			
10-Ancillary Service Market	10	15	Ancillary Service Award - Interval Value	The awarded Value for the Time Interval within the ancillary service Award	The value associated with a specific ancillary service schedule interval			Y			
10-Ancillary Service Market	10	16	Ancillary Service Award - Cleared Price	Awarded Price	The market clearing price for the cleared ancillary service product MW.			Y			
10-Ancillary Service Market	10	17	Ancillary Service Schedule ID	<u>-Unique identifier assigned to each ancillary service schedule.</u>	~~Unique identifier assigned to each ancillary service schedule.~~			Y			
10-Ancillary Service Market	10	20	Ancillary Service Product Qualification Type	Type of Qualification	Examples include initial, requalification, etc.			Y			
10-Ancillary Service Market	10	21	Synchronization Test Date	Target Date of Test of Synchronization to the grid				Y			

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10-Ancillary Service Market	10	22	Ancillary Service Product Type Qualification Date	Date of Qualification of the Resource				Y			
10-Ancillary Service Market	10	23	Ancillary Service Product Type Qualified	Type of Ancillary Service Product(s) for which the Resource has Qualified				Y			
10-Ancillary Service Market	10	24	Requalification Requirement	Flag set if Requalification is Required				Y			
10-Ancillary Service Market	10	31	Reserve Pickup Flag	Flag set if this is a Reserve Pickup schedule	Reserve Service is a type of Demand Response service in which Demand Resources are obligated to be available to provide Demand reduction Energy Service, based on reserve capacity requirements that are established to meet applicable reliability standards. Reserve Services are defined by short-term response rates (Ramp Period) and synchronization with the electricity grid (i.e., spinning and non-spinning reserves).			Y			

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Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
10-Ancillary Service Market	10	32	Regulation Base Point	Per-interval Regulation dispatch instruction	Regulation Service is a type of Demand Response service in which a Demand Resource corrects for short-term changes in electricity use that might affect the stability of the power system, matching generation and load to maintain a desired frequency. Demand Resources providing Regulation Service are subject to dispatch continuously during a commitment period. Provision of Regulation Service does not correlate to Demand Response deployment terms of the Event timelines, deadlines and durations.			Y			
10-Ancillary Service Market	10	33	Base Load MW	Level of Load at time of dispatch				Y			
11-Capacity Market	11		Capacity Market								
11-Capacity Market	11	10	Capacity Type	Type of Capacity	Capacity Service is a type of Demand Response service in which Demand Resources are obligated over a defined period of time to be available to deliver upon deployment by the System Operator or Service Provider. Examples: Hourly, Monthly, etc.			Y			Y
11-Capacity Market	11	11	~~Capacity Type description~~ <u>Capacity Type Description</u>	Description of the Type of Capacity				Y			Y
11-Capacity Market	11	20	Peak Value	Measurement of Peak				Y			

Late Comments Submitted by D. Pratt, J. Phillips and B. Bartell



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant:

REQ

Requesters:

Smart Grid Interoperability Panel

Request No.:

2010 REQ Annual Plan Item 9 (a-c)

Request Title:

Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
11-Capacity Market	11	21	Peak Type	Type of measurement of Peak	Examples are: Annual, Monthly, Weekly, and Seasonal.			Y			
11-Capacity Market	11	22	Peak Date/Time	Date and Time of measurement of Peak				Y			
11-Capacity Market	11	23	Nominal Capacity	Nominated load	Expressed as a decimal value.			Y			Y
11-Capacity Market	11	24	Qualified Capacity	Nominal ~~ICAP~~ installed capacity (ICAP) derated for performance	Derated based on past performance.			Y			Y
11-Capacity Market	11	30	Capacity Obligation Period Type	Type of Capacity Obligation Time Period within which the Resource is obligated	Examples are: All hours, Business hours 1, Business hours 2, Business Hours 3, Non-Business hours.			Y			
11-Capacity Market	11	31	Capacity Obligation Period	Period of time for which the Capacity Resource is Obligated	Examples include: month, season, year, etc.			Y			
11-Capacity Market	11	40	Minimum Payment Nomination	Strike price for the economic dispatch of the energy component of the capacity program	Expressed in Price/MW.			Y			
11-Capacity Market	11	41	Capacity Supply Obligation	Capacity Obligation	This may result from an auction or other clearing mechanism.			Y			
11-Capacity Market	11	50	Capacity Reference ID	Identifier assigned to the External System award	An Award is the selection of a Resource to provide energy, ancillary services, or capacity for a future time period. Expressed as a string.			Y			

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RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
11-Capacity Market	11	991	Capacity Comments	Comments associated with the Capacity market				Y			
12-Event and Performance	12		Event and Performance								
12-Event and Performance	12	10	Event ID	Identifier assigned to the Event	An Event consists of the time periods, deadlines, and transitions during which Demand Resources perform. The System Operator shall specify the duration and applicability of a Demand Response Event. Some deadlines, time periods, and transitions may not be not applicable to all products or services.			Y			Y
12-Event and Performance	12	11	Deployment Type	Type of Deployment	Examples are: Advanced (Normal), Immediate, Audit/Test			Y			Y
12-Event and Performance	12	12	Event Day	Operating Date of Start of Event				Y			Y
12-Event and Performance	12	13	Event Description	Description of the Event				Y			
12-Event and Performance	12	14	Event Start Time	Time of Start of deployment period for Event	The Deployment Period is the period of time from the Deployment to Release/Recall.			Y			Y
12-Event and Performance	12	15	Operator Comment	Additional Event information provided by the Operator				Y			

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RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	16	Deployment MW	Absolute or relative Deployment quantity	Expressed as an absolute or relative (%) MW value.			Y			Y
12-Event and Performance	12	17	Event Status	Status of the Event	Examples include: initiated, completed, etc.			Y			Y
12-Event and Performance	12	18	Event End Time	Time of End of deployment period	Release/Recall is the notification, sent from the System Operator or Service Demand Response Provider to the Demand Resource, that the Deployment Period has ended or announcing the time that it will end.			Y			Y
12-Event and Performance	12	19	Event Modification Number	A modification number for the DR event. This is used to indicate if the DR Event has been modified by the Utility. Each time it is modified, this number is incremented.				Y			Y
12-Event and Performance	12	111	Notification Acknowledgement	This is an acknowledgement of the receipt of a DR notification or dispatch. It should include any necessary provisions for non-repudiation.				Y			Y
12-Event and Performance	12	112	Event Modification Reason Code	The reason the event is being cancelled or modified.				Y			Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	113	Load Level Value	Value of the load level to be achieved based on a set of enumerated values (e.g., moderate, high, etc.).							Y
12-Event and Performance	12	21	Baseline Dates	Dates of days used to calculate the Energy Baseline	The Baseline Window is the window of time preceding, and optionally following, a Demand Response Event, over which electricity consumption data is collected for the purpose of establishing a Baseline. The applicability of this term is limited to Meter Before/Meter After, and Baseline Type-I and Type-II.			Y			Y
12-Event and Performance	12	22	Baseline Exclusion Dates	Dates of days Excluded from the calculation of the Energy Baseline				Y			Y
12-Event and Performance	12	23	Energy Baseline Value	Calculated Energy Baseline	A Baseline is an estimate of the electricity that would have been consumed by a Demand Resource in the absence of a Demand Response Event. The Baseline is compared to the actual metered electricity consumption during the Demand Response Event to determine the Demand Modification Value. Depending on the type of Demand Response product or service, Baseline calculations may be performed in real time or after the fact.			Y			Y
12-Event and Performance	12	24	Energy Baseline Timestamp	Timestamp of Energy Baseline				Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	30	Reporting Interval	Interval size required for Reporting				Y			Y
12-Event and Performance	12	31	Measurement Value Timestamp (CIM)	The time when the value was last updated				Y			Y
12-Event and Performance	12	32	Measurement Value (CIM)	Value of the interval reading				Y			Y
12-Event and Performance	12	33	Response Value	Response				Y			Y
12-Event and Performance	12	34	Measurement Value Type	The type of measurement value.	The Measurement Value Type identifies the type of information provided in the Measurement Value. For example, the Measurement Value type could be energy (kWh/MWh) or demand (KW or MW).			Y			
12-Event and Performance	12	50	Simple Signal Levels	Used as an alternate and simplified representation of the DR signal, whether it be price based or a dispatch. Takes on a small number of finite levels such as NORMAL, MODERATE, and HIGH, SPECIAL							Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	51	Criticality Level	This field defines the level of criticality of this event. The action taken by load control devices for an event can be solely based on this value, or in combination with other Load Control Event fields supported by this device.	For example, additional fields such as Average Load Adjustment Percentage, Duty Cycle, Cooling Temperature Offset, Heating Temperature Offset, Cooling Temperature Set Point or Heating Temperature Set Point can be used in combination with the Criticality level. Criticality Level Level Description Participation 0 Reserved 1 Green Voluntary 2 1 Voluntary 3 2 Voluntary 4 3 Voluntary 5 4 Voluntary 6 5 Voluntary 7 Emergency Mandatory 8 Planned Outage Mandatory 9 Service Disconnect Mandatory 0x0A to 0x0F Utility Defined Utility						Y
12-Event and Performance	12	52	Usage Information	Information about the near real time electricity usage of the DR Resource.							Y
12-Event and Performance	12	991	Event & Performance ~~comments~~ <u>Performance Comments</u>	Comments associated with Event and Performance data				Y			
13-Direct Load Control	13		Direct Load Control								

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
13-Direct Load Control	13	10	Status Check	A signal to require the DR resource status to be sent back. (Only applicable to Direct Load Control)							Y
13-Direct Load Control	13	11	DR Control Command: Direct Load Control Type	The type of DR Direct Load Control Command: e.g. Set Point, Open/Close, Heating Temperature - offset/setpoint, Cooling Temperature - offset/setpoint, Load adjustment offset							Y
13-Direct Load Control	13	12	DR Control Command: Direct Load Control Value	Value associated with the Direct Load Control Type.							Y
13-Direct Load Control	13	13	Duty Cycle	"Duty Cycle : Defines the maximum On state duty cycle as a percentage of time. Example, if the value is 80, the device would be in an "on state" for 80% of the time for the duration of the event. Range of the value is 0 to 100. A value of 0xFF indicates the field							Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
				is not used." (from SEP2.0)							
13-Direct Load Control	13	14	Event Control	Event Control options for randomized start or end times: 1= Randomized Start time, 0=Randomized Start not Applied 1= Randomized End time, 0=Randomized End not Applied. (from SEP2.0)							Y
13-Direct Load Control	13	15	Exception Conditions	This is used to report that the load controller may not behave as commanded because of a variety of conditions including: • Faults in device • Customer override.							Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
13-Direct Load Control	13	16	Load Control State	The state of the load, which includes both commanded states and user settings. This may include a schedule of future states if a particular control algorithm for the load controller is being executed.							Y
14-Price and Product	14		Price and Product								
14-Price and Product	14	10	Product Name	Same as 7.13 Market Product	An identifier for a particular electricity product offering: energy, capacity, ancillary services, etc.	Y					
14-Price and Product	14	11	Product Type	Defines the source and product	Classifications used within industry for trading energy. Examples: PJM Energy, NYISO 10-min Spin, etc.	Y					Y
14-Price and Product	14	12	Product Sub-type	Used to further define product types		Y			Y		
14-Price and Product	14	13	Identifier Source (product)	The Identifier Source references the product identification scheme for the Product Identifier.		Y					
14-Price and Product	14	14	Unit of Measure	Attribute of Product Identifier		Y					Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
14-Price and Product	14	15	Currency	Economic unit of exchange in which the total price and price components are stated (e.g. dollars, euros)		Y			Y		Y
14-Price and Product	14	20	Product Identifier	Identifies specific product associated with the price		Y			Y		
14-Price and Product	14	30	Override Unit of Measure	Optional Attribute of Price object If this is used, then Unit of Measure is not applicable		Y					
14-Price and Product	14	31	Product Price	The sum of all Price Component Values for a given product (Total Price).		Y					Y
14-Price and Product	14	32	Product Price Factor	Terms of use attribute of Product Price	Examples: Price_absolute, Price_relative, Price_multiplier	Y			Y		
14-Price and Product	14	33	Price Component Type	The portion of the price to which the corresponding value applies.	Examples: Energy, congestion, losses	Y					
14-Price and Product	14	34	Price Component Value	The value of the price component.		Y					
14-Price and Product	14	35	Price Location	The location at which the price is applicable.		Y					
14-Price and Product	14	36	Price Type	Time characteristic of the price	The type of price (day-ahead, real-time, etc.).	Y					

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
14-Price and Product	14	37	Delivery Time	Time at which the product is available for physical consumption		Y			Y		Y
14-Price and Product	14	38	Delivery Interval	The duration over which the product is available for physical consumption		Y			Y		Y
14-Price and Product	14	40	Source Location Identifier	The identifier of the source location of the product for which the price applies		Y			Y		
14-Price and Product	14	41	Source Location Identifier Type	The type of source location of the product for which the price applies		Y					



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Wholesale Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 6 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03, PAP 04 and PAP 09

4. Supporting Documentation

a. Description of Request:

2010 REQ Annual Plan Item 9 and 2010 REQ Annual Plan Item 6 – “Develop Smart Grid Wholesale and Retail Electric Standards”

b. Description of Recommendation:

This recommendation provides the data [requirements elements](#) related to the use cases developed for Priority Action Plan 03 and 09 as part of the phase one effort

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the development of standard DR and DER signals.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- March 11, 2010 Meeting Notes – To be posted
- March 18, 2010 Meeting Notes – To be posted
- March 25, 2010 Meeting Notes – To be posted
- April 1, 2010 Meeting Notes – To be posted
- April 8, 2010 Meeting Notes – To be posted
- April 29, 2010 Meeting Notes – To be posted
- May 13, 2010 Meeting Notes – To be posted
- May 20, 2010 Meeting Notes – To be posted
- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes – To be posted
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Wholesale Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 6 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03, PAP 04 and PAP 09

- August 26, 2010 Meeting Notes – http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc
- September 9, 2010 Meeting Notes – http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes – http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes – To be posted



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

1. RECOMMENDED ACTION:

☒ Accept as requested
☐ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☒ Initiation
☐ Modification
☐ Interpretation
☐ Withdrawal

☐ Principle
☐ Definition
☐ Business Practice Standard
☐ Document
☒ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☒ Initiation
☐ Modification
☐ Interpretation
☐ Withdrawal

☐ Principle
☐ Definition
☐ Business Practice Standard
☐ Document
☒ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY: The Master Data Elements List contains the list of data elements used in the use cases that were developed for PAP 03 and PAP 09 in the phase one effort.



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

RECOMMENDED STANDARDS:

REQ-020.1 Smart Grid Standards Data Elements Table

Introduction

This Business Practice Standard contains the list of data elements used in Business Practice Standards REQ-016 and REQ-018. Specific application of the data elements to a given use case contained in REQ-016 and REQ-018 are identified within the appropriate Business Practice Standard. This Business Practice Standard and data elements included herein are not intended to (i) require the use of any of these data elements, (ii) require the provision or purchase of any products, programs, rates, markets or services, or (iii) supersede applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this standard.

The intent is to clearly specify the business information that may be necessary to be exchanged to make effective and reasonable business decisions. Standards or implementations that do not directly use such schemas and element names may conform to these requirements through clearly defined mapping documentation.

Capitalization of words within the Short Description or Long Description of a data element refers to the name of another data element within this Master Data Element List, not a NAESB defined term.

REQ-020.1.1 Alphabetical Listing by Data Element Name

** Listing by Category ID and Category Element ID begins in section REQ-020.1.2*

Late Comments Submitted by L. Tillman on behalf of Southern Compaies



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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	10	Address1	Address line 1				Y			Y
2-Location	2	11	Address2	Address line 2				Y			Y
10-Ancillary Service Market	10	16	Ancillary Service Award - Cleared Price	Awarded Price	The market clearing price for the cleared ancillary service product MW.			Y			
10-Ancillary Service Market	10	13	Ancillary Service Award - End Time	End Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.			Y			
10-Ancillary Service Market	10	14	Ancillary Service Award - Interval Start Time	Start Time of the ancillary service Interval within the ancillary service Award and the ancillary service Value of the Time Interval	The start time of a specific ancillary service schedule interval			Y			
10-Ancillary Service Market	10	15	Ancillary Service Award - Interval Value	The awarded Value for the Time Interval within the ancillary service Award	The value associated with a specific ancillary service schedule interval			Y			
10-Ancillary Service Market	10	12	Ancillary Service Award - Start Time	Start Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.			Y			
10-Ancillary Service Market	10	0	Ancillary Service Instruction ID	Unique identifier assigned to each ancillary service instruction.				Y			

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10-Ancillary Service Market	10	20	Ancillary Service Product Qualification Type	Type of Qualification	Examples include initial, requalification, etc.			Y			
10-Ancillary Service Market	10	10	Ancillary Service Product Type	Type of Ancillary Service product(s) the Resource is enrolling to provide				Y			Y
10-Ancillary Service Market	10	22	Ancillary Service Product Type Qualification Date	Date of Qualification of the Resource				Y			
10-Ancillary Service Market	10	23	Ancillary Service Product Type Qualified	Type of Ancillary Service Product(s) for which the Resource has Qualified				Y			
10-Ancillary Service Market	10	17	Ancillary Service Schedule ID	Unique identifier assigned to each ancillary service schedule.				Y			
6-Device and Qualification	6	229 4	ANSI Compliance	ANSI standard with which the Meter complies				Y			
1-General Asset / Resource	1	30	Asset Group ID	The identifier of a group of assets	An Asset Group is a logical entity that has a reportable interval-level consumption.			Y			Y
1-General Asset / Resource	1	31	Asset Group Name	Name of the aggregated group of assets				Y			Y
1-General Asset / Resource	1	12	Asset ID	The unique identifier of the asset				Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	83	Asset Manufacture Date	Date of Manufacture of the Asset							Y
6-Device and Qualification	6	80	Asset Manufacturer	Manufacturer of the Asset							Y
6-Device and Qualification	6	81	Asset Model	Model identifier of the Asset, assigned by the Manufacturer							Y
2-Location	2	51	Asset Multiplier	Number of identical Assets within the Service Location				Y			
1-General Asset / Resource	1	13	Asset Name	The name of the asset				Y			
5-Business Entity Relationships	5	90	Asset Operator ID	The identifier of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.							Y
5-Business Entity Relationships	5	91	Asset Operator Name	The name of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.							Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	92	Asset Owner ID	The Identifier of the business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).							Y
5-Business Entity Relationships	5	93	Asset Owner Name	The Name of business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).							Y
6-Device and Qualification	6	84	Asset Type	Type of Asset	Examples are: load reduction or response (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.						Y
6-Device and Qualification	6	82	Asset Version	Model version identifier, assigned by the Manufacturer							Y
10-Ancillary Service Market	10	33	Base Load MW	Level of Load at time of dispatch				Y			
9-Energy Market	9	20	Base Point	Per-interval dispatch instruction	A Dispatch is a real-time instruction to a Resource to move to a Base Point at a specific time (Resource-Specific Deployment) or a set of real-time instructions to multiple Resources (Bulk Deployment). A Resource-Specific Deployment is the deployment, via established Communication Methods initiated by the System Operator, of one or			Y			

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RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
					more discrete and/or unique Resources designated to provide a selected service.						
12-Event and Performance	12	21	Baseline Dates	Dates of days used to calculate the Energy Baseline	The Baseline Window is the window of time preceding, and optionally following, a Demand Response Event, over which electricity consumption data is collected for the purpose of establishing a Baseline. The applicability of this term is limited to Meter Before/Meter After, and Baseline Type-I and Type-II.			Y			Y
12-Event and Performance	12	22	Baseline Exclusion Dates	Dates of days Excluded from the calculation of the Energy Baseline				Y			Y
1-General Asset / Resource	1	51	Batch Load Flag	Flag set if the Resource is a Batch Load				Y			
9-Energy Market	9	21	Breaker Status	Status of the Breaker for the Resource				Y			
6-Device and Qualification	6	45	Breaker Status During Event	Status of the Breaker for the Service Location during an Emergency Event				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
1-General Asset / Resource	1	50	Business Segment	SIC or NAICS code of the Service Location				Y			
6-Device and Qualification	6	43	Capable of Synchronizing to Grid	Flag set if the Service Location is capable of Synchronizing to the Grid				Y			
11-Capacity Market	11	991	Capacity Comments	Comments associated with the Capacity market				Y			
11-Capacity Market	11	31	Capacity Obligation Period	Period of time for which the Capacity Resource is Obligated	Examples include: month, season, year, etc.			Y			
11-Capacity Market	11	30	Capacity Obligation Period Type	Type of Capacity Obligation Time Period within which the Resource is obligated	Examples are: All hours, Business hours 1, Business hours 2, Business Hours 3, Non-Business hours.			Y			
11-Capacity Market	11	50	Capacity Reference ID	Identifier assigned to the External System award	An Award is the selection of a Resource to provide energy, ancillary services, or capacity for a future time period. Expressed as a string.			Y			
11-Capacity Market	11	41	Capacity Supply Obligation	Capacity Obligation	This may result from an auction or other clearing mechanism.			Y			
11-Capacity Market	11	10	Capacity Type	Type of Capacity	Capacity Service is a type of Demand Response service in which Demand Resources are obligated over a defined period of time to be available to deliver upon deployment by the System Operator or Service Provider. Examples: Hourly, Monthly, etc.			Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
11-Capacity Market	11	11	Capacity Type Description	Description of the Type of Capacity				Y			Y
2-Location	2	12	City	City				Y			Y
2-Location	2	50	Competitive Choice Area	Flag set if the Service Location is in an area with Competitive Choice				Y			
4-Grid Connection	4	12	Connect Voltage	Voltage level	Voltage at connection.			Y			
2-Location	2	72	Connection Address	Address associated with the Connection Type	Example: Address of ICCP Connection, IP address			Y			
2-Location	2	71	Connection Type	Additional type of connection associated with the Service Delivery Point	Example: ICCP Connection, IP address			Y			
8-Offer Parameters	8	72	Constraint Interval	The timeframe over which the constraint type applies.	Typically daily, hourly, weekly, date			Y			Y
8-Offer Parameters	8	71	Constraint Type	Type of operational, schedule or offer constraint	Types of operational, offer or schedule parameters. Examples include: Select Operational Minimum Runtime, Schedule Minimum Runtime, Operational Maximum Runtime, Schedule Maximum Runtime, Minimum Load, Maximum Load, Minimum Downtime, Minimum Starts, Maximum Energy, Maximum Starts, Time of Day schedule constraints, Black out date, Maximum consecutive days of participation, Maximum calls per day, Minimum Advanced Notification, Minimum duration of			Y			Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
					participation, etc.						
8-Offer Parameters	8	73	Constraint Value	Value of the Constraint Type and Interval				Y			Y
3-Contact	3	31	Contact Address Data	Method-dependent Address of the Contact	This identifies specific information for the contact method selected.			Y			
3-Contact	3	991	Contact Comments	Comments associated with the Contact				Y			
3-Contact	3	30	Contact Method	Method of communication with the Contact	This identifies the various types of communication options (phone, email, etc.) which may be used.			Y			
3-Contact	3	32	Contact Method Priority	Order in which a Communication Method should be selected for a Contact	A Communication Method is the medium by which an object communicates with another object for instruction, measurement, or control. The user specifies the sequence in which each medium is to be used when being contacted.			Y			

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Category		Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
							PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
	3-Contact	3	23	Middle Name [Revise Order]	Middle Name of the Contact				Y			
	3-Contact	3	11	Contact Priority	Order in which this Contact should be selected	This is used when multiple contacts are defined.				Y		
	3-Contact	3	10	Contact Type	Interest code associated with a Contact	This is a classification defining the function a particular contact serves. It supports "who to call for what needs" decisions. Examples are: Primary, Secondary, Billing, Third Party, and Authorized Representative.				Y		
	2-Location	2	15	Country	Country				Y			Y
12-Event and Performance		12	51	Criticality Level	This field defines the level of criticality of this event. The action taken by load control devices for an event can be solely based on this value, or in combination with other Load Control Event fields supported by this device.	For example, additional fields such as Average Load Adjustment Percentage, Duty Cycle, Cooling Temperature Offset, Heating Temperature Offset, Cooling Temperature Set Point or Heating Temperature Set Point can be used in combination with the Criticality level. Criticality Level Level Description Participation 0 Reserved 1 Green Voluntary 2 1 Voluntary 3 2 Voluntary 4 3 Voluntary 5 4 Voluntary 6 5 Voluntary 7 Emergency Mandatory 8 Planned Outage Mandatory 9 Service Disconnect Mandatory 0x0A to 0x0F Utility Defined Utility Defined						Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	291	CT Ratio	Ratio of the Current Transformer				Y			
14-Price and Product	14	15	Currency	Economic unit of exchange in which the total price and price components are stated (e.g. dollars, euros)		Y			Y		Y
6-Device and Qualification	6	228	Date of Last Meter Test	Date of Last Test of the Meter				Y			
7-Market / Program Enrollment	7	31	Day Ahead Flag	Flag set if the Resource will be participating in the Day-Ahead market				Y			
14-Price and Product	14	38	Delivery Interval	The duration over which the product is available for physical consumption		Y			Y		Y
14-Price and Product	14	37	Delivery Time	Time at which the product is available for physical consumption		Y			Y		Y
5-Business Entity Relationships	5	14	Demand Response Controlling Entity	An identifier for the Service Provider issuing the DR event deployment instructions.							Y
5-Business Entity Relationships	5	13	Demand Response Provider	The entity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response							Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
				products.							
12-Event and Performance	12	16	Deployment MW	Absolute or relative Deployment quantity	Expressed as an absolute or relative (%) MW value.			Y			Y
12-Event and Performance	12	11	Deployment Type	Type of Deployment	Examples are: Advanced (Normal), Immediate, Audit/Test			Y			Y
5-Business Entity Relationships	5	80	Designated Dispatch Entity ID	Identifier assigned to the Designated Dispatch Entity	The Designated Dispatch Entity receives and processes Demand Resource Dispatch instructions or market information and may provide response information.			Y			
5-Business Entity Relationships	5	81	Designated Dispatch Entity Name	Name of the Designated Dispatch Entity				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	70	Device Class	Note: From SEP2.0 Enumeration representing the Device Class to apply the current Load Control Event. 0 HVAC compressor or furnace 1 Strip Heaters/Baseboard Heaters 2 Water Heater 3 Pool Pump/Spa/Jacuzzi 4 Smart Appliances 5 Irrigation Pump 6 Managed Commercial & Industrial (C&I) loads 7 Simple misc. (Residential On/Off) loads 8 Exterior Lighting 9 Interior Lighting 10 Electric Vehicle 11 Generation Systems 12 to 15 Reserved							Y
6-Device and Qualification	6	991	Distributed Generator Comments	Comments associated with the Distributed Generator				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	32	Distributed Generator Fuel Type	Type of Fuel consumed by the Distributed Generator				Y			
6-Device and Qualification	6	34	Distributed Generator Manufacturer	Manufacturer of the Distributed Generator				Y			Y
6-Device and Qualification	6	39	Distributed Generator Name	Name of the Distributed Generator				Y			
6-Device and Qualification	6	33	Distributed Generator Permit Type	Type of environmental authorization required to operate the Distributed Generator	The Environmental Authority is a regulatory authority responsible for the development, reporting, and enforcement of environmental activities.			Y			
6-Device and Qualification	6	30	Distributed Generator Type	Type of Distributed Generator	This technology characteristic of the Distributed Generator, such as combined cycle, induction, etc.			Y			
9-Energy Market	9	24	DR Bus Load MW	Instantaneous Bus Load of a Demand Resource providing Ancillary Services	Demand is the rate at which electric energy is being used by the customer (NERC Definition). Expressed in MW. This element only applies to DR			Y			
13-Direct Load Control	13	11	DR Control Command: Direct Load Control Type	The type of DR Direct Load Control Command: e.g. Set Point, Open/Close, Heating Temperature - offset/setpoint, Cooling Temperature -							Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
				offset/setpoint, Load adjustment offset							
13-Direct Load Control	13	12	DR Control Command: Direct Load Control Value	Value associated with the Direct Load Control Type.							Y
1-General Asset / Resource	1	22	DR Resource Group ID	Grouping of Resources that can respond to the same DR signal							Y
3-Contact	3	12	DUNS Number	DUNS business number				Y			
13-Direct Load Control	13	13	Duty Cycle	“Duty Cycle : Defines the maximum On state duty cycle as a percentage of time. Example, if the value is 80, the device would be in an “on state” for 80% of the time for the duration of the event. Range of the value is 0 to 100. A value of 0xFF indicates the field is not used.” (from SEP2.0)							Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	21	Effective Enrollment Date	Effective Start Date for the Enrollment	Market Enrollment is the collection of enrollment or tariff data for a Demand Resource to provide a specific market product or service.			Y			Y
2-Location	2	40	Electrical Node ID	Identifier assigned to the Electrical Node at which the Service Location is connected				Y			Y
2-Location	2	41	Electrical Node Name	Name of the Electrical Node at which the Service Location is connected				Y			Y
2-Location	2	42	Electrical Node Type	Type of Electrical Node at which the Service Location is attached				Y			Y
12-Event and Performance	12	24	Energy Baseline Timestamp	Timestamp of Energy Baseline				Y			Y
12-Event and Performance	12	23	Energy Baseline Value	Calculated Energy Baseline	A Baseline is an estimate of the electricity that would have been consumed by a Demand Resource in the absence of a Demand Response Event. The Baseline is compared to the actual metered electricity consumption during the Demand Response Event to determine the Demand Modification Value. Depending on the type of Demand Response product or service, Baseline calculations may be performed in real time or after the fact.			Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	13	Energy Schedule - Cleared MW Interval Value	The Energy Value of cleared MW for the Time Interval within the Energy Schedule	The offered energy MW that have cleared the market.			Y			
9-Energy Market	9	14	Energy Schedule - Cleared Price	Awarded Price	The market clearing price for the cleared energy MW.			Y			
9-Energy Market	9	11	Energy Schedule - End Time	End Time of the Energy Schedule	A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).			Y			
9-Energy Market	9	12	Energy Schedule - Interval Start Time	Start Time of the Energy Interval within the Energy Schedule	The start time of a specific energy schedule interval			Y			
9-Energy Market	9	10	Energy Schedule - Start Time	Start Time of the Energy Schedule	A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).			Y			Y
7-Market / Program Enrollment	7	25	Enrollment End Date	Date of Termination of Enrollment				Y			Y
7-Market / Program Enrollment	7	22	Enrollment Status	Status of the Enrollment for the Facility or Resource	Examples: Pending Enrollment, Approved Enrollment, Under Review, Denied, Separated			Y			Y
12-Event and Performance	12	991	Event & Performance Comments	Comments associated with Event and Performance data				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
13-Direct Load Control	13	14	Event Control	Event Control options for randomized start or end times: 1= Randomized Start time, 0=Randomized Start not Applied 1= Randomized End time, 0=Randomized End not Applied. (from SEP2.0)							Y
12-Event and Performance	12	12	Event Day	Operating Date of Start of Event				Y			Y
12-Event and Performance	12	13	Event Description	Description of the Event				Y			
12-Event and Performance	12	18	Event End Time	Time of End of deployment period	Release/Recall is the notification, sent from the System Operator or Service Demand Response Provider to the Demand Resource, that the Deployment Period has ended or announcing the time that it will end.			Y			Y
12-Event and Performance	12	10	Event ID	Identifier assigned to the Event	An Event consists of the time periods, deadlines, and transitions during which Demand Resources perform. The System Operator shall specify the duration and applicability of a Demand Response Event. Some deadlines, time periods, and transitions may not be not applicable to all products or services.			Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	19	Event Modification Number	A modification number for the DR event. This is used to indicate if the DR Event has been modified by the Utility. Each time it is modified, this number is incremented.				Y			Y
12-Event and Performance	12	112	Event Modification Reason Code	The reason the event is being cancelled or modified.				Y			Y
12-Event and Performance	12	14	Event Start Time	Time of Start of deployment period for Event	The Deployment Period is the period of time from the Deployment to Release/Recall.			Y			Y
12-Event and Performance	12	17	Event Status	Status of the Event	Examples include: initiated, completed, etc.			Y			Y
13-Direct Load Control	13	15	Exception Conditions	This is used to report that the load controller may not behave as commanded because of a variety of conditions including: • Faults in device • Customer override.							Y
5-Business Entity Relationships	5	991	External Entity Comments	Comments associated with the External Entity				Y			
3-Contact	3	21	First Name	First Name of the Contact				Y			
1-General Asset / Resource	1	41	Gen Billing ID	Billing Identifier assigned to the Resource				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
1-General Asset / Resource	1	40	Gen EMS ID	Alias or point Identifier assigned to the Resource				Y			
1-General Asset / Resource	1	991	General Resource Comments	General comments associated with the Resource				Y			
2-Location	2	20	GPS Coordinates	Latitude and longitude				Y			Y
4-Grid Connection	4	991	Grid Connection Comments	Comments associated with the Grid Connection of the Resource				Y			
10-Ancillary Service Market	10	11	Have Engineering Diagram	Flag set if One-Line Diagrams have been submitted				Y			
14-Price and Product	14	13	Identifier Source (product)	The Identifier Source references the product identification scheme for the Product Identifier.		Y					
6-Device and Qualification	6	37	In-Service Date	Date the Distributed Generator became operational				Y			
6-Device and Qualification	6	36	Installation Date of Distributed Generator	Date of Installation of the Distributed Generator				Y			
9-Energy Market	9	0	Instruction ID	Unique identifier assigned to each instruction.				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	41	Interconnection Agreement Type	Type of Interconnection Agreement between the Distributed Generator or Service Location and the TDSP				Y			
6-Device and Qualification	6	42	Interconnection Limits	Limits associated with the Interconnection of the Distributed Generator or Service Location				Y			
3-Contact	3	22	Last Name	Last Name of the Contact				Y			
7-Market / Program Enrollment	7	30	Lead Time	Time between the advanced notification and deployment	Notification is the transmittal of a Deployment message.			Y			Y
13-Direct Load Control	13	16	Load Control State	The state of the load, which includes both commanded states and user settings. This may include a schedule of future states if a particular control algorithm for the load controller is being executed.							Y
12-Event and Performance	12	113	Load Level Value	Value of the load level to be achieved based on a set of enumerated values (e.g., moderate, high, etc.).							Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	52	Load Resource Control Device	Type of Control Device at a Service Location or deployed by a Response Method				Y			
5-Business Entity Relationships	5	30	Load Serving Entity ID	Identifier assigned to the LSE	The Load-Serving Entity serves end users and sells electric energy to end users.			Y			
5-Business Entity Relationships	5	31	Load Serving Entity Name	Name of the LSE				Y			
2-Location	2	991	Location Comments	Comments associated with the Service Location				Y			
4-Grid Connection	4	10	Loss Factor Type	Type of Loss Factor				Y			
4-Grid Connection	4	11	Loss Factor Value	Loss Factor	Expressed as a decimal value.			Y			
6-Device and Qualification	6	35	Manufactured Date of Distributed Generator	Date of Manufacturer of the Distributed Generator				Y			Y
7-Market / Program Enrollment	7	12	Market	Type of wholesale market				Y			
8-Offer Parameters	8	40	Market Clearing Day	Market Clearing Day of the Offer				Y			
7-Market / Program	7	991	Market Enrollment Comments	Comments associated with the Enrollment				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
Enrollment											
7-Market / Program Enrollment	7	13	Market Product	Market Product	Product types include the following: energy, capacity, regulation, operating reserves (spinning or non-spin).			Y			Y
6-Device and Qualification	6	28	Maximum Error	Error of the Meter, including end-to-end Maximum Error				Y			
6-Device and Qualification	6	2293	Measurement Interval	Interval of time between Measurement readings	This is the time between electricity meter recordings. The Measurement records the consumption or supply of an End Device. An End Device is a physical end-use device that consumes or supplies electricity.			Y			
12-Event and Performance	12	32	Measurement Value (CIM)	Value of the interval reading				Y			Y
12-Event and Performance	12	31	Measurement Value Timestamp (CIM)	The time when the value was last updated				Y			Y
12-Event and Performance	12	34	Measurement Value Type	The type of measurement value.	The Measurement Value Type identifies the type of information provided in the Measurement Value. For example, the Measurement Value type could be energy (kWh/MWh) or demand (KW or MW).			Y			
6-Device and Qualification	6	26	Meter Accuracy Class	Accuracy Class of the Meter				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	229 6	Meter Asset Comments	Comments associated with the Meter Asset				Y			
5-Business Entity Relationships	5	60	Meter Authority ID	Identifier assigned to the Metering Authority	The Metering Authority provides electric usage data necessary to determine the performance of a Resource.			Y			
5-Business Entity Relationships	5	61	Meter Authority Name	Name of the Metering Authority				Y			
6-Device and Qualification	6	10	Meter Configuration	Configuration of the Meter at the Facility	The CIM defines the Meter as the physical asset that performs the metering role of the ServiceDeliveryPoint. It is used for measuring consumption and detecting events.			Y			
6-Device and Qualification	6	224	Meter Correction Factors	Device-specific Factors used to adjust for atmospheric changes at the point of installation of the Meter				Y			
6-Device and Qualification	6	227	Meter Device QA Plan	Quality Assurance plan for maintenance and testing of the Meter				Y			
6-Device and Qualification	6	20	Meter ID	Identifier assigned to the Meter				Y			
6-Device and Qualification	6	221	Meter Installation Date	Date of Installation of the Meter				Y			
5-Business Entity	5	50	Meter Installation Provider ID	Identifier assigned to the Meter Installation Provider				Y			

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RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
Relationships											
5-Business Entity Relationships	5	51	Meter Installation Provider Name	Name of the Meter Installation Provider	This is the meter entity for the meter device.			Y			
6-Device and Qualification	6	223	Meter Installer License	Professional License Number of the Installer of the Meter				Y			
6-Device and Qualification	6	27	Meter Loss Compensation	Line Losses included in the Meter				Y			
6-Device and Qualification	6	22	Meter Manufacturer	Manufacturer of the Meter				Y			
6-Device and Qualification	6	23	Meter Model	Model of the Meter				Y			
6-Device and Qualification	6	25	Meter Multiplier (kH)	Multiplier used to convert pulses into power units				Y			
6-Device and Qualification	6	229 5	Meter Owner	Owner of the Meter				Y			
6-Device and Qualification	6	29	Meter Phase	Specific Phase information				Y			
6-Device and Qualification	6	229	Meter Qualification Date	Date of Qualification of the Meter by the Metering Authority or System Operator				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	24	Meter Rating	Load Rating of the Meter				Y			
6-Device and Qualification	6	225	Meter Test Criteria	Test Criteria required to qualify the installation of the Meter				Y			
6-Device and Qualification	6	226	Meter Test Frequency	Frequency of Tests of the Meter	Expressed in months.			Y			
6-Device and Qualification	6	229 1	Meter Test Results	Results of Tests of the Meter	These are specific to the meter type.			Y			
6-Device and Qualification	6	21	Meter Type	Type of Meter installed at the Facility	Examples: RTU, CT/PT, etc.			Y			
8-Offer Parameters	8	21	Min Gen MW	Minimum MW available for dispatch	When required as part of an enrollment request, this value acts as a default.			Y			Y
8-Offer Parameters	8	22	Min Gen Cost	The cost per hour for each Min Gen MW value.	The cost per hour for each MinGenMW value.			Y			Y
11-Capacity Market	11	40	Minimum Payment Nomination	Strike price for the economic dispatch of the energy component of the capacity program	Expressed in Price/MW.			Y			
6-Device and Qualification	6	31	Nameplate Rating	Manufacturer's output rating of the Distributed Generator				Y			
0-Common Message Parameters	0	20	NERC CIP Security - Availability	CIP Security Classification for Availability				Y			

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0-Common Message Parameters	0	21	NERC CIP Security - Confidentiality	CIP Security Classification for Confidentiality				Y			
0-Common Message Parameters	0	22	NERC CIP Security - Integrity	CIP Security Classification for Integrity				Y			
2-Location	2	60	NERC Control Area	The NERC control area of the resource				Y			
11-Capacity Market	11	23	Nominal Capacity	Nominated load	Expressed as a decimal value.			Y			Y
6-Device and Qualification	6	44	Normal Breaker Status	Status of the Breaker for the Service Location under Normal operating conditions	Normal Operations is the time following Release/Recall during which a System Operator or Service Provider may require a Demand Resource to have returned its Load consumption to normal levels and to be available again for Deployment.			Y			
6-Device and Qualification	6	38	Normal Load Rating	Average load picked up by the Distributed Generator during the applicable performance hours				Y			
12-Event and Performance	12	111	Notification Acknowledgement	This is an acknowledgement of the receipt of a DR notification or dispatch. It should include any necessary provisions for non-repudiation.				Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	38	Offer Commit Status	Commitment status of offer	Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc.			Y			Y
8-Offer Parameters	8	39	Offer Dispatch Status	Dispatch Status of Offer	Product-specific commitment status types included with offer. Examples include: economic, emergency, not participating, not qualified, and self-schedule. May also be used to temporarily opt out of DR Events and to override the normal operational constraints. The opt-out can be specified using the following criteria: • All events in a program indefinitely (unspecified time period) • Specific DR Event • All events in a specific time period. • Other triggered programs for which an asset or DR resource is already called upon (reduce double counting of available capacity)			Y			Y
8-Offer Parameters	8	30	Offer Dispatch Type	Type of Offer	Examples are Flexible (resource follows basepoint signals) or Fixed (resource requests DA commitment and RT schedules of 15 minutes or greater)			Y			
8-Offer Parameters	8	36	Offer Expiration Date	Date of Expiration of the Offer	This applies to DAM only.			Y			

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8-Offer Parameters	8	12	Offer Limit Interval	Offer Limit Interval	The period over which the offer limit applies, i.e., hour, day, etc.			Y			Y
8-Offer Parameters	8	11	Offer Limit Type	Type of Offer Limit	The limit may be associated with the bidding parameters of a resource. These may include limit types such as seasonal rating, reasonability, economic and ramp limits.			Y			Y
8-Offer Parameters	8	10	Offer Limit Value	Offer Limit Value	Expressed in MW or hours. Multiple Limit Types may be applicable.			Y			Y
8-Offer Parameters	8	331	Offer Price Curve Slope	Flag to smooth offer segments from step function to slope				Y			
8-Offer Parameters	8	33	Offer Segment Hour	Hour of Segment of the Offer	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
8-Offer Parameters	8	31	Offer Segment MW	Energy of Segment of the Offer	The end value of the offer step, monotonically increasing, expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)			Y			
8-Offer Parameters	8	32	Offer Segment Price	Price of Segment of the Offer	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
12-Event and Performance	12	15	Operator Comment	Additional Event information provided by the Operator				Y			
9-Energy Market	9	23	Output MVAR	Reactive Power Output of the Distributed Generator	Expressed in Mvar			Y			
9-Energy Market	9	22		Real Power Output of the Distributed Generator	Expressed in MW			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
			Output MW								
14-Price and Product	14	30	Override Unit of Measure	Optional Attribute of Price object If this is used, then Unit of Measure is not applicable		Y					
6-Device and Qualification	6	11	Parent Meter ID	Flag set if the Meter is a Master or Parent Meter				Y			
11-Capacity Market	11	22	Peak Date/Time	Date and Time of measurement of Peak				Y			
11-Capacity Market	11	21	Peak Type	Type of measurement of Peak	Examples are: Annual, Monthly, Weekly, and Seasonal.			Y			
11-Capacity Market	11	20	Peak Value	Measurement of Peak				Y			
7-Market / Program Enrollment	7	51	Performance Evaluation Method	Method used to Evaluate the Performance of a Resource	Based on NAESB M&V terms.			Y			
7-Market / Program Enrollment	7	50	Performance Evaluation Method Type Code	Code representing the Type of Measurement				Y			
8-Offer Parameters	8	20	Physical Min Gen	Minimum Operating Level of a Resource				Y			Y
2-Location	2	43	PNode	Name of the Price Node associated with the Service Location	The P-Node is the price location of the Service Location in the transmission and/or distribution network.			Y			Y

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2-Location	2	44	PNode ID	Identifier assigned to the Price Node associated with the Service Location				Y			Y
8-Offer Parameters	8	50	Portfolio Name	Name of an aggregation of Resources for market participation				Y			
14-Price and Product	14	33	Price Component Type	The portion of the price to which the corresponding value applies.	Examples: Energy, congestion, losses	Y					
14-Price and Product	14	34	Price Component Value	The value of the price component.		Y					
14-Price and Product	14	35	Price Location	The location at which the price is applicable.		Y					
14-Price and Product	14	36	Price Type	Time characteristic of the price	The type of price (day-ahead, real-time, etc.).	Y					
6-Device and Qualification	6	47	Private Use Network	Flag set if the Resource is an Electric Network connected to the transmission grid	This is used for load that is typically netted with internal generation.			Y			
14-Price and Product	14	20	Product Identifier	Identifies specific product associated with the price		Y			Y		
14-Price and Product	14	10	Product Name	Same as 7.13 Market Product	An identifier for a particular electricity product offering: energy, capacity, ancillary services, etc.	Y					
14-Price and Product	14	31	Product Price	The sum of all Price Component Values for a given product (Total Price).		Y					Y

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14-Price and Product	14	32	Product Price Factor	Terms of use attribute of Product Price	Examples: Price_absolute, Price_relative, Price_multiplier	Y			Y		
14-Price and Product	14	12	Product Sub-type	Used to further define product types		Y			Y		
14-Price and Product	14	11	Product Type	Defines the source and product	Classifications used within industry for trading energy. Examples: PJM Energy, NYISO 10-min Spin, etc.	Y					Y
7-Market / Program Enrollment	7	10	Program ID	Program Identifier	The identifier of the program			Y			Y
7-Market / Program Enrollment	7	11	Program Name	Name of the Program				Y			Y
6-Device and Qualification	6	222	PT Ratio	Ratio of the Potential Transformer				Y			
11-Capacity Market	11	24	Qualified Capacity	Nominal installed capacity (ICAP) derated for performance	Derated based on past performance.			Y			Y
8-Offer Parameters	8	25	Ramp Rate Direction	Direction of the selected Ramp Rate Type and Ramp Rate Segment	Valid directions are: Upward, Downward, Both.			Y			Y
8-Offer Parameters	8	24	Ramp Rate Segment	Energy of Segment of the Ramp Rate	The end value of the Ramp Rate step, monotonically increasing or decreasing (as indicated by the Ramp Rate Direction), expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)			Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	23	Ramp Rate Type	Type of Ramp Rate	Examples are: Normal, Emergency, Regulation.			Y			Y
8-Offer Parameters	8	26	Ramp Rate Value	Ramp Rate associated with the selected Ramp Rate Type for the selected Ramp Rate Segment and Ramp Rate Direction	The NERC definition of Ramp Rate is the rate, expressed in megawatts per minute, by which a generator changes its output. For a Demand Resource, the Ramp Rate is the rate, expressed in megawatts per minute, by which a Demand Resource changes its Load.			Y			Y
7-Market / Program Enrollment	7	32	Real Time Flag	Flag set if the Resource will be participating in the Real-Time market				Y			
10-Ancillary Service Market	10	32	Regulation Base Point	Per-interval Regulation dispatch instruction	Regulation Service is a type of Demand Response service in which a Demand Resource corrects for short-term changes in electricity use that might affect the stability of the power system, matching generation and load to maintain a desired frequency. Demand Resources providing Regulation Service are subject to dispatch continuously during a commitment period. Provision of Regulation Service does not correlate to Demand Response deployment terms of the Event timelines, deadlines and durations.			Y			
0-Common Message Parameters	0	13	Rejection Code Type	Type of rejection message	Rejection code type is categorizing the different kinds of rejection messages associated with enrollment, qualification, offers or meter data. May be combined with comments to provide details beyond the type of rejection.			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
0-Common Message Parameters	0	14	Rejection Code Value	Code referring to the reason for a rejection message	Rejection code related to the type of rejection. May be combined with comments to provide details beyond the type of rejection.			Y			
12-Event and Performance	12	30	Reporting Interval	Interval size required for Reporting				Y			Y
10-Ancillary Service Market	10	24	Requalification Requirement	Flag set if Requalification is Required				Y			
7-Market / Program Enrollment	7	26	Requalification Test Date	Date the Resource will retest its ability to deliver a product or service				Y			Y
10-Ancillary Service Market	10	31	Reserve Pickup Flag	Flag set if this is a Reserve Pickup schedule	Reserve Service is a type of Demand Response service in which Demand Resources are obligated to be available to provide Demand reduction Energy Service, based on reserve capacity requirements that are established to meet applicable reliability standards. Reserve Services are defined by short-term response rates (Ramp Period) and synchronization with the electricity grid (i.e., spinning and non-spinning reserves).			Y			
1-General Asset / Resource	1	20	Resource ID	Identifier assigned to the Resource	A Resource may be an individual asset or a group of assets that represent a dispatchable entity.			Y			Y
1-General Asset / Resource	1	21	Resource Name	Name of the Resource				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	24	Resource Qualification Test Date	Date the Resource demonstrated its ability to deliver a product or service				Y			Y
7-Market / Program Enrollment	7	23	Resource Type	Type of Resource	Examples are: load reduction or response (curtailable or interruptible load), distributed generation, combination, renewable, storage, etc.			Y			Y
7-Market / Program Enrollment	7	41	Response Method ID	Identifier assigned to the Response Method				Y			
7-Market / Program Enrollment	7	42	Response Method Name	Name of the Response Method				Y			
7-Market / Program Enrollment	7	40	Response Method Type	Type of Response Method	Expressed as a response type code			Y			
7-Market / Program Enrollment	7	43	Response Method Value	Value of the Response Method	The Demand Response Value is the quantity of modified electrical consumption by a Demand Resource, expressed as MW.			Y			
7-Market / Program Enrollment	7	34	Response Time	The amount of time before an asset/resource is capable of meeting its full performance, in response to a request by a Service Provider to shed load or produce energy.							Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	33	Response Value	Response				Y			Y
5-Business Entity Relationships	5	44	Retail Rate	Retail Rate	Expressed as Price per kWh			Y			
5-Business Entity Relationships	5	41	Retail Rate Code	Code representing the Retail Rate for the Service Location				Y			
5-Business Entity Relationships	5	43	Retail Rate Description	Description of the Retail Rate	This can also be used for comments associated with the Retail Rate.			Y			
5-Business Entity Relationships	5	40	Retail Rate ID	Identifier assigned to the Retail Rate				Y			
5-Business Entity Relationships	5	42	Retail Rate Name	Name of the Retail Rate for the Service Location				Y			
8-Offer Parameters	8	42	Schedule Description	Description of the Offer				Y			
9-Energy Market	9	15	Schedule ID	Unique identifier assigned to each schedule.				Y			
8-Offer Parameters	8	41	Schedule Name	Name or tag of the Offer				Y			
8-Offer Parameters	8	43	Schedule Status	Status of the Offer				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	70	Scheduling Entity ID	Identifier assigned to the Scheduling Entity	A Scheduling Entity submits bids and/or offers and receives Schedules and Awards.			Y			
5-Business Entity Relationships	5	71	Scheduling Entity Name	Name of the Scheduling Entity				Y			
7-Market / Program Enrollment	7	33	Self-Schedule Flag	Flag set if the Resource is Self-Deploying	Self-Deployment is the Deployment via established Communication Methods initiated by the Service Provider or the Resource.			Y			
1-General Asset / Resource	1	10	Service Location ID	Identifier assigned to the Service Location	The location at which connection to the transmission or distribution system is made.			Y			Y
1-General Asset / Resource	1	11	Service Location Name	Name of the Service Location				Y			
5-Business Entity Relationships	5	11	Service Provider ID	Identifier assigned to the Service Provider	The Service Provider coordinates Resources to deliver electricity products and services to a market or distribution operator.			Y			Y
5-Business Entity Relationships	5	12	Service Provider Name	Name of the Service Provider				Y			

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9-Energy Market	9	25	Set Point	Final dispatch target level	The real-time desired MW output signal calculated for a specific Resource by the Transmission Provider's control system on a specified periodicity that is equal to the current Energy Dispatch Target plus the Regulating Reserve Deployment instruction (which may be positive or negative) plus an adjustment to the Energy Dispatch Target to account for Contingency Reserve Deployment Instructions. The Setpoint Instruction represents the desired output level of the Resource.			Y			
12-Event and Performance	12	50	Simple Signal Levels	Used as an alternate and simplified representation of the DR signal, whether it be price based or a dispatch. Takes on a small number of finite levels such as NORMAL, MODERATE, and HIGH, SPECIAL							Y
14-Price and Product	14	40	Source Location Identifier	The identifier of the source location of the product for which the price applies		Y			Y		
14-Price and Product	14	41	Source Location Identifier Type	The type of source location of the product for which the price applies		Y					
8-Offer Parameters	8	34	Startup Cost	Cost of starting a response activity	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			

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8-Offer Parameters	8	37	Startup Cost Type	Type of startup cost	The type of Start Up Cost included in the offer. Options may include: Select cold, intermediate, hot or shutdown.			Y			
2-Location	2	13	State/Province	State or Province two-letter code				Y			Y
13-Direct Load Control	13	10	Status Check	A signal to require the DR resource status to be sent back. (Only applicable to Direct Load Control)							Y
8-Offer Parameters	8	35	Strike Price	Threshold Price	Expressed as a decimal value of price/MW.			Y			
8-Offer Parameters	8	332	Strike Price Type	Type of strike price	Indicates the type of strike price. Options may include: buy or sell.			Y			
0-Common Message Parameters	0	10	Submittal Date	Timestamp for the sender's use				Y			
0-Common Message Parameters	0	11	Submitted By	User ID of submitter	Common data element to indicate the user ID of the entity submitting the data			Y			
0-Common Message Parameters	0	12	Submitted Error	ID of submission error detected	Common data element to capture any errors or exceptions during submission			Y			
10-Ancillary Service Market	10	21	Synchronization Test Date	Target Date of Test of Synchronization to the grid				Y			
3-Contact	3	13	Third Party	Flag set if the Contact is a				Y			

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				third-party entity							
2-Location	2	22	Time Zone Name	Name of the Time Zone in which the Service Location is located				Y			
3-Contact	3	20	Title	Title of the Contact				Y			
5-Business Entity Relationships	5	22	Transmission / Distribution Service Provider Account Number	Transmission / Distribution Service Provider's account number for the Resource				Y			Y
5-Business Entity Relationships	5	20	Transmission / Distribution Service Provider ID	Identifier assigned to the Transmission / Distribution Service Provider	The Transmission / Distribution Service Provider operates a local electricity transmission and/or distribution system.			Y			
5-Business Entity Relationships	5	21	Transmission / Distribution Service Provider Name	Name of the Transmission / Distribution Service Provider				Y			
6-Device and Qualification	6	51	UFR Settings	Setting of the Under-Frequency Relay				Y			
14-Price and Product	14	14	Unit of Measure	Attribute of Product Identifier		Y					Y
12-Event and Performance	12	52	Usage Information	Information about the near real time electricity usage of the DR Resource.							Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	229 2	VEE Compliance	Compliance standard for Validation, Editing, and Estimation	Validation, Editing, and Estimation is the process of taking raw meter data and performing validation and, as necessary, editing and estimation of corrupt or missing data, to create validated data. VEE guidelines are published in the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering, Volume Two, Published 12/05/00, http://www.naesb.org/req_form.asp .			Y			
7-Market / Program Enrollment	7	44	Verified Capability	Audited Capability	Auditing is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods AFTER the Enrollment process.			Y			
7-Market / Program Enrollment	7	45	Verified Capability Factor	Ratio of the Verified Capability to the qualified capability	Qualification is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods DURING the Enrollment process.			Y			
2-Location	2	21	Weather Station	Weather Station code associated with the Service Location				Y			Y
6-Device and Qualification	6	46	Wholesale Delivery Point Status	Flag set if the Service Location is metered at the Wholesale level				Y			
2-Location	2	14	Zip/Postal Code	Zip or Postal Code				Y			Y
2-Location	2	31	Zone	Name of the Zone in which the Service Location is located	A Zone is a physical or electrical region.			Y			Y

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RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	30	Zone ID	Identifier assigned to the Zone in which the Service Location is located				Y			Y
2-Location	2	32	Zone Type	Type of Zone	Examples: Capacity, Dispatch, Price, Load, etc.			Y			

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REQ-020.1.2 Listing by Category ID and Category Element ID

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
0-Common Message Parameters	0		Common Message Parameters								
0-Common Message Parameters	0	10	Submittal Date	Timestamp for the sender's use				Y			
0-Common Message Parameters	0	11	Submitted By	User ID of submitter	Common data element to indicate the user ID of the entity submitting the data			Y			
0-Common Message Parameters	0	12	Submitted Error	ID of submission error detected	Common data element to capture any errors or exceptions during submission			Y			
0-Common Message Parameters	0	13	Rejection Code Type	Type of rejection message	Rejection code type is categorizing the different kinds of rejection messages associated with enrollment, qualification, offers or meter data. May be combined with comments to provide details beyond the type of rejection.			Y			
0-Common Message Parameters	0	14	Rejection Code Value	Code referring to the reason for a rejection message	Rejection code related to the type of rejection. May be combined with comments to provide details beyond the type of rejection.			Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
0-Common Message Parameters	0	20	NERC CIP Security - Availability	CIP Security Classification for Availability				Y			
0-Common Message Parameters	0	21	NERC CIP Security - Confidentiality	CIP Security Classification for Confidentiality				Y			
0-Common Message Parameters	0	22	NERC CIP Security - Integrity	CIP Security Classification for Integrity				Y			
1-General Asset / Resource	1		General Asset/Resource								
1-General Asset / Resource	1	10	Service Location ID	Identifier assigned to the Service Location	The location at which connection to the transmission or distribution system is made.			Y			Y
1-General Asset / Resource	1	11	Service Location Name	Name of the Service Location				Y			
1-General Asset / Resource	1	12	Asset ID	The unique identifier of the asset				Y			Y
1-General Asset / Resource	1	13	Asset Name	The name of the asset				Y			
1-General Asset / Resource	1	20	Resource ID	Identifier assigned to the Resource	A Resource may be an individual asset or a group of assets that represent a dispatchable entity.			Y			Y
1-General Asset / Resource	1	21	Resource Name	Name of the Resource				Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
1-General Asset / Resource	1	22	DR Resource Group ID	Grouping of Resources that can respond to the same DR signal							Y
1-General Asset / Resource	1	30	Asset Group ID	The identifier of a group of assets	An Asset Group is a logical entity that has a reportable interval-level consumption.			Y			Y
1-General Asset / Resource	1	31	Asset Group Name	Name of the aggregated group of assets				Y			Y
1-General Asset / Resource	1	40	Gen EMS ID	Alias or point Identifier assigned to the Resource				Y			
1-General Asset / Resource	1	41	Gen Billing ID	Billing Identifier assigned to the Resource				Y			
1-General Asset / Resource	1	50	Business Segment	SIC or NAICS code of the Service Location				Y			
1-General Asset / Resource	1	51	Batch Load Flag	Flag set if the Resource is a Batch Load				Y			
1-General Asset / Resource	1	991	General Resource Comments	General comments associated with the Resource				Y			
2-Location	2		Location								
2-Location	2	10	Address1	Address line 1				Y			Y
2-Location	2	11	Address2	Address line 2				Y			Y
2-Location	2	12	City	City				Y			Y
2-Location	2	13	State/Province	State or Province two-letter code				Y			Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	14	Zip/Postal Code	Zip or Postal Code				Y			Y
2-Location	2	15	Country	Country				Y			Y
2-Location	2	20	GPS Coordinates	Latitude and longitude				Y			Y
2-Location	2	21	Weather Station	Weather Station code associated with the Service Location				Y			Y
2-Location	2	22	Time Zone Name	Name of the Time Zone in which the Service Location is located				Y			
2-Location	2	30	Zone ID	Identifier assigned to the Zone in which the Service Location is located				Y			Y
2-Location	2	31	Zone	Name of the Zone in which the Service Location is located	A Zone is a physical or electrical region.			Y			Y
2-Location	2	32	Zone Type	Type of Zone	Examples: Capacity, Dispatch, Price, Load, etc.			Y			
2-Location	2	40	Electrical Node ID	Identifier assigned to the Electrical Node at which the Service Location is connected				Y			Y
2-Location	2	41	Electrical Node Name	Name of the Electrical Node at which the Service Location is connected				Y			Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
2-Location	2	42	Electrical Node Type	Type of Electrical Node at which the Service Location is attached				Y			Y
2-Location	2	43	PNode	Name of the Price Node associated with the Service Location	The P-Node is the price location of the Service Location in the transmission and/or distribution network.			Y			Y
2-Location	2	44	PNode ID	Identifier assigned to the Price Node associated with the Service Location				Y			Y
2-Location	2	50	Competitive Choice Area	Flag set if the Service Location is in an area with Competitive Choice				Y			
2-Location	2	51	Asset Multiplier	Number of identical Assets within the Service Location				Y			
2-Location	2	60	NERC Control Area	The NERC control area of the resource				Y			
2-Location	2	71	Connection Type	Additional type of connection associated with the Service Delivery Point	Example: ICCP Connection, IP address			Y			
2-Location	2	72	Connection Address	Address associated with the Connection Type	Example: Address of ICCP Connection, IP address			Y			
2-Location	2	991	Location Comments	Comments associated with the Service Location				Y			
3-Contact	3		Contact								

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
3-Contact	3	10	Contact Type	Interest code associated with a Contact	This is a classification defining the function a particular contact serves. It supports "who to call for what needs" decisions. Examples are: Primary, Secondary, Billing, Third Party, and Authorized Representative.			Y			
3-Contact	3	11	Contact Priority	Order in which this Contact should be selected	This is used when multiple contacts are defined.			Y			
3-Contact	3	12	DUNS Number	DUNS business number				Y			
3-Contact	3	13	Third Party	Flag set if the Contact is a third-party entity				Y			
3-Contact	3	20	Title	Title of the Contact				Y			
3-Contact	3	21	First Name	First Name of the Contact				Y			
3-Contact	3	22	Last Name	Last Name of the Contact				Y			
3-Contact	3	23	Middle Name [Revise Order]	Middle Name of the Contact				Y			
3-Contact	3	30	Contact Method	Method of communication with the Contact	This identifies the various types of communication options (phone, email, etc.) which may be used.			Y			
3-Contact	3	31	Contact Address Data	Method-dependent Address of the Contact	This identifies specific information required for the contact method selected.			Y			
3-Contact	3	32	Contact Method Priority	Order in which a Communication Method should be selected for a Contact	A Communication Method is the medium by which an object communicates with another object for instruction, measurement, or control. The user specifies the sequence in which each medium is to be used when			Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
					being contacted.						
3-Contact	3	991	Contact Comments	Comments associated with the Contact				Y			
4-Grid Connection	4		Grid Connection								
4-Grid Connection	4	10	Loss Factor Type	Type of Loss Factor				Y			
4-Grid Connection	4	11	Loss Factor Value	Loss Factor	Expressed as a decimal value.			Y			
4-Grid Connection	4	12	Connect Voltage	Voltage level	Voltage at connection.			Y			
4-Grid Connection	4	991	Grid Connection Comments	Comments associated with the Grid Connection of the Resource				Y			
5-Business Entity Relationships	5		Business Entity Relationships								
5-Business Entity Relationships	5	11	Service Provider ID	Identifier assigned to the Service Provider	The Service Provider coordinates Resources to deliver electricity products and services to a market or distribution operator.			Y			Y
5-Business Entity	5	12	Service Provider Name	Name of the Service Provider				Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
Relationships											
5-Business Entity Relationships	5	13	Demand Response Provider	The entity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response products.							Y
5-Business Entity Relationships	5	14	Demand Response Controlling Entity	An identifier for the Service Provider issuing the DR event deployment instructions.							Y
5-Business Entity Relationships	5	20	Transmission / Distribution Service Provider ID	Identifier assigned to the Transmission / Distribution Service Provider	The Transmission / Distribution Service Provider operates a local electricity transmission and/or distribution system.			Y			
5-Business Entity Relationships	5	21	Transmission / Distribution Service Provider Name	Name of the Transmission / Distribution Service Provider				Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	22	Transmission / Distribution Service Provider Account Number	Transmission / Distribution Service Provider's account number for the Resource				Y			Y
5-Business Entity Relationships	5	30	Load Serving Entity ID	Identifier assigned to the LSE	The Load-Serving Entity serves end users and sells electric energy to end users.			Y			
5-Business Entity Relationships	5	31	Load Serving Entity Name	Name of the LSE				Y			
5-Business Entity Relationships	5	40	Retail Rate ID	Identifier assigned to the Retail Rate				Y			
5-Business Entity Relationships	5	41	Retail Rate Code	Code representing the Retail Rate for the Service Location				Y			
5-Business Entity Relationships	5	42	Retail Rate Name	Name of the Retail Rate for the Service Location				Y			
5-Business Entity Relationships	5	43	Retail Rate Description	Description of the Retail Rate	This can also be used for comments associated with the Retail Rate.			Y			
5-Business Entity Relationships	5	44	Retail Rate	Retail Rate	Expressed as Price per kWh			Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	50	Meter Installation Provider ID	Identifier assigned to the Meter Installation Provider				Y			
5-Business Entity Relationships	5	51	Meter Installation Provider Name	Name of the Meter Installation Provider	This is the meter entity for the meter device.			Y			
5-Business Entity Relationships	5	60	Meter Authority ID	Identifier assigned to the Metering Authority	The Metering Authority provides electric usage data necessary to determine the performance of a Resource.			Y			
5-Business Entity Relationships	5	61	Meter Authority Name	Name of the Metering Authority				Y			
5-Business Entity Relationships	5	70	Scheduling Entity ID	Identifier assigned to the Scheduling Entity	A Scheduling Entity submits bids and/or offers and receives Schedules and Awards.			Y			
5-Business Entity Relationships	5	71	Scheduling Entity Name	Name of the Scheduling Entity				Y			
5-Business Entity Relationships	5	80	Designated Dispatch Entity ID	Identifier assigned to the Designated Dispatch Entity	The Designated Dispatch Entity receives and processes Demand Resource Dispatch instructions or market information and may provide response information.			Y			
5-Business Entity Relationships	5	81	Designated Dispatch Entity Name	Name of the Designated Dispatch Entity				Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	90	Asset Operator ID	The identifier of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.							Y
5-Business Entity Relationships	5	91	Asset Operator Name	The name of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.							Y
5-Business Entity Relationships	5	92	Asset Owner ID	The Identifier of the business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).							Y
5-Business Entity Relationships	5	93	Asset Owner Name	The Name of business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).							Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
5-Business Entity Relationships	5	991	External Entity Comments	Comments associated with the External Entity				Y			
6-Device and Qualification	6		Device and Qualification								
6-Device and Qualification	6	10	Meter Configuration	Configuration of the Meter at the Facility	The CIM defines the Meter as the physical asset that performs the metering role of the ServiceDeliveryPoint. It is used for measuring consumption and detecting events.			Y			
6-Device and Qualification	6	11	Parent Meter ID	Flag set if the Meter is a Master or Parent Meter				Y			
6-Device and Qualification	6	20	Meter ID	Identifier assigned to the Meter				Y			
6-Device and Qualification	6	21	Meter Type	Type of Meter installed at the Facility	Examples: RTU, CT/PT, etc.			Y			
6-Device and Qualification	6	22	Meter Manufacturer	Manufacturer of the Meter				Y			
6-Device and Qualification	6	221	Meter Installation Date	Date of Installation of the Meter				Y			
6-Device and Qualification	6	222	PT Ratio	Ratio of the Potential Transformer				Y			
6-Device and Qualification	6	223	Meter Installer License	Professional License Number of the Installer of the Meter				Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	224	Meter Correction Factors	Device-specific Factors used to adjust for atmospheric changes at the point of installation of the Meter				Y			
6-Device and Qualification	6	225	Meter Test Criteria	Test Criteria required to qualify the installation of the Meter				Y			
6-Device and Qualification	6	226	Meter Test Frequency	Frequency of Tests of the Meter	Expressed in months.			Y			
6-Device and Qualification	6	227	Meter Device QA Plan	Quality Assurance plan for maintenance and testing of the Meter				Y			
6-Device and Qualification	6	228	Date of Last Meter Test	Date of Last Test of the Meter				Y			
6-Device and Qualification	6	229	Meter Qualification Date	Date of Qualification of the Meter by the Metering Authority or System Operator				Y			
6-Device and Qualification	6	229 1	Meter Test Results	Results of Tests of the Meter	These are specific to the meter type.			Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	229 2	VEE Compliance	Compliance standard for Validation, Editing, and Estimation	Validation, Editing, and Estimation is the process of taking raw meter data and performing validation and, as necessary, editing and estimation of corrupt or missing data, to create validated data. VEE guidelines are published in the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering, Volume Two, Published 12/05/00, http://www.naesb.org/REQ/req_form.asp .			Y			
6-Device and Qualification	6	229 3	Measurement Interval	Interval of time between Measurement readings	This is the time between electricity meter recordings. The Measurement records the consumption or supply of an End Device. An End Device is a physical end-use device that consumes or supplies electricity.			Y			
6-Device and Qualification	6	229 4	ANSI Compliance	ANSI standard with which the Meter complies				Y			
6-Device and Qualification	6	229 5	Meter Owner	Owner of the Meter				Y			
6-Device and Qualification	6	229 6	Meter Asset Comments	Comments associated with the Meter Asset				Y			
6-Device and Qualification	6	23	Meter Model	Model of the Meter				Y			
6-Device and Qualification	6	24	Meter Rating	Load Rating of the Meter				Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	25	Meter Multiplier (kH)	Multiplier used to convert pulses into power units				Y			
6-Device and Qualification	6	26	Meter Accuracy Class	Accuracy Class of the Meter				Y			
6-Device and Qualification	6	27	Meter Loss Compensation	Line Losses included in the Meter				Y			
6-Device and Qualification	6	28	Maximum Error	Error of the Meter, including end-to-end Maximum Error				Y			
6-Device and Qualification	6	29	Meter Phase	Specific Phase information				Y			
6-Device and Qualification	6	291	CT Ratio	Ratio of the Current Transformer				Y			
6-Device and Qualification	6	30	Distributed Generator Type	Type of Distributed Generator	This technology characteristic of the Distributed Generator, such as combined cycle, induction, etc.			Y			
6-Device and Qualification	6	31	Nameplate Rating	Manufacturer's output rating of the Distributed Generator				Y			
6-Device and Qualification	6	32	Distributed Generator Fuel Type	Type of Fuel consumed by the Distributed Generator				Y			

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For Quadrant:

REQ

Requesters:

Smart Grid Interoperability Panel

Request No.:

2010 REQ Annual Plan Item 9 (a-c)

Request Title:

Master Data Elements List for Business Practice Standards associated with NIST
PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	33	Distributed Generator Permit Type	Type of environmental authorization required to operate the Distributed Generator	The Environmental Authority is a regulatory authority responsible for the development, reporting, and enforcement of environmental activities.			Y			
6-Device and Qualification	6	34	Distributed Generator Manufacturer	Manufacturer of the Distributed Generator				Y			Y
6-Device and Qualification	6	35	Manufactured Date of Distributed Generator	Date of Manufacturer of the Distributed Generator				Y			Y
6-Device and Qualification	6	36	Installation Date of Distributed Generator	Date of Installation of the Distributed Generator				Y			
6-Device and Qualification	6	37	In-Service Date	Date the Distributed Generator became operational				Y			
6-Device and Qualification	6	38	Normal Load Rating	Average load picked up by the Distributed Generator during the applicable performance hours				Y			
6-Device and Qualification	6	39	Distributed Generator Name	Name of the Distributed Generator				Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	41	Interconnection Agreement Type	Type of Interconnection Agreement between the Distributed Generator or Service Location and the TDSP				Y			
6-Device and Qualification	6	42	Interconnection Limits	Limits associated with the Interconnection of the Distributed Generator or Service Location				Y			
6-Device and Qualification	6	43	Capable of Synchronizing to Grid	Flag set if the Service Location is capable of Synchronizing to the Grid				Y			
6-Device and Qualification	6	44	Normal Breaker Status	Status of the Breaker for the Service Location under Normal operating conditions	Normal Operations is the time following Release/Recall during which a System Operator or Service Provider may require a Demand Resource to have returned its Load consumption to normal levels and to be available again for Deployment.			Y			
6-Device and Qualification	6	45	Breaker Status During Event	Status of the Breaker for the Service Location during an Emergency Event				Y			
6-Device and Qualification	6	46	Wholesale Delivery Point Status	Flag set if the Service Location is metered at the Wholesale level				Y			
6-Device and Qualification	6	47	Private Use Network	Flag set if the Resource is an Electric Network connected to the	This is used for load that is typically netted with internal generation.			Y			

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RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
				transmission grid							
6-Device and Qualification	6	51	UFR Settings	Setting of the Under-Frequency Relay				Y			
6-Device and Qualification	6	52	Load Resource Control Device	Type of Control Device at a Service Location or deployed by a Response Method				Y			
6-Device and Qualification	6	70	Device Class		Note: From SEP2.0 Enumeration representing the Device Class to apply the current Load Control Event. 0 HVAC compressor or furnace 1 Strip Heaters/Baseboard Heaters 2 Water Heater 3 Pool Pump/Spa/Jacuzzi 4 Smart Appliances 5 Irrigation Pump 6 Managed Commercial & Industrial (C&I) loads 7 Simple misc. (Residential On/Off) loads 8 Exterior Lighting 9 Interior Lighting 10 Electric Vehicle 11 Generation Systems 12 to 15 Reserved						Y
6-Device and Qualification	6	80	Asset Manufacturer	Manufacturer of the Asset							Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
6-Device and Qualification	6	81	Asset Model	Model identifier of the Asset, assigned by the Manufacturer							Y
6-Device and Qualification	6	82	Asset Version	Model version identifier, assigned by the Manufacturer							Y
6-Device and Qualification	6	83	Asset Manufacture Date	Date of Manufacture of the Asset							Y
6-Device and Qualification	6	84	Asset Type	Type of Asset	Examples are: load reduction or response (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.						Y
6-Device and Qualification	6	991	Distributed Generator Comments	Comments associated with the Distributed Generator				Y			
7-Market / Program Enrollment	7		Market/Program Enrollment								
7-Market / Program Enrollment	7	10	Program ID	Program Identifier	The identifier of the program			Y			Y
7-Market / Program Enrollment	7	11	Program Name	Name of the Program				Y			Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	12	Market	Type of wholesale market				Y			
7-Market / Program Enrollment	7	13	Market Product	Market Product	Product types include the following: energy, capacity, regulation, operating reserves (spinning or non-spin).			Y			Y
7-Market / Program Enrollment	7	21	Effective Enrollment Date	Effective Start Date for the Enrollment	Market Enrollment is the collection of enrollment or tariff data for a Demand Resource to provide a specific market product or service.			Y			Y
7-Market / Program Enrollment	7	22	Enrollment Status	Status of the Enrollment for the Facility or Resource	Examples: Pending Enrollment, Approved Enrollment, Under Review, Denied, Separated			Y			Y
7-Market / Program Enrollment	7	23	Resource Type	Type of Resource	Examples are: load reduction or response (curtailable or interruptible load), distributed generation, combination, renewable, storage, etc.			Y			Y
7-Market / Program Enrollment	7	24	Resource Qualification Test Date	Date the Resource demonstrated its ability to deliver a product or service				Y			Y
7-Market / Program Enrollment	7	25	Enrollment End Date	Date of Termination of Enrollment				Y			Y
7-Market / Program Enrollment	7	26	Requalification Test Date	Date the Resource will retest its ability to deliver a product or service				Y			Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	30	Lead Time	Time between the advanced notification and deployment	Notification is the transmittal of a Deployment message.			Y			Y
7-Market / Program Enrollment	7	31	Day Ahead Flag	Flag set if the Resource will be participating in the Day-Ahead market				Y			
7-Market / Program Enrollment	7	32	Real Time Flag	Flag set if the Resource will be participating in the Real-Time market				Y			
7-Market / Program Enrollment	7	33	Self-Schedule Flag	Flag set if the Resource is Self-Deploying	Self-Deployment is the Deployment via established Communication Methods initiated by the Service Provider or the Resource.			Y			
7-Market / Program Enrollment	7	34	Response Time	The amount of time before an asset/resource is capable of meeting its full performance, in response to a request by a Service Provider to shed load or produce energy.							Y
7-Market / Program Enrollment	7	40	Response Method Type	Type of Response Method	Expressed as a response type code			Y			
7-Market / Program Enrollment	7	41	Response Method ID	Identifier assigned to the Response Method				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
7-Market / Program Enrollment	7	42	Response Method Name	Name of the Response Method				Y			
7-Market / Program Enrollment	7	43	Response Method Value	Value of the Response Method	The Demand Response Value is the quantity of modified electrical consumption by a Demand Resource, expressed as MW.			Y			
7-Market / Program Enrollment	7	44	Verified Capability	Audited Capability	Auditing is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods AFTER the Enrollment process.			Y			
7-Market / Program Enrollment	7	45	Verified Capability Factor	Ratio of the Verified Capability to the qualified capability	Qualification is the validation of performance, conducted by the System Operator, of certain Response Aggregation Methods DURING the Enrollment process.			Y			
7-Market / Program Enrollment	7	50	Performance Evaluation Method Type Code	Code representing the Type of Measurement				Y			
7-Market / Program Enrollment	7	51	Performance Evaluation Method	Method used to Evaluate the Performance of a Resource	Based on NAESB M&V terms.			Y			
7-Market / Program Enrollment	7	991	Market Enrollment Comments	Comments associated with the Enrollment				Y			
8-Offer Parameters	8		Offer Parameters								

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Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	10	Offer Limit Value	Offer Limit Value	Expressed in MW or hours. Multiple Limit Types may be applicable.			Y			Y
8-Offer Parameters	8	11	Offer Limit Type	Type of Offer Limit	The limit may be associated with the bidding parameters of a resource. These may include limit types such as seasonal rating, reasonability, economic and ramp limits.			Y			Y
8-Offer Parameters	8	12	Offer Limit Interval	Offer Limit Interval	The period over which the offer limit applies, i.e., hour, day, etc.			Y			Y
8-Offer Parameters	8	20	Physical Min Gen	Minimum Operating Level of a Resource				Y			Y
8-Offer Parameters	8	21	Min Gen MW	Minimum MW available for dispatch	When required as part of an enrollment request, this value acts as a default.			Y			Y
8-Offer Parameters	8	22	Min Gen Cost	The cost per hour for each Min Gen MW value.	The cost per hour for each MinGenMW value.			Y			Y
8-Offer Parameters	8	23	Ramp Rate Type	Type of Ramp Rate	Examples are: Normal, Emergency, Regulation.			Y			Y
8-Offer Parameters	8	24	Ramp Rate Segment	Energy of Segment of the Ramp Rate	The end value of the Ramp Rate step, monotonically increasing or decreasing (as indicated by the Ramp Rate Direction), expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)			Y			Y
8-Offer Parameters	8	25	Ramp Rate Direction	Direction of the selected Ramp Rate Type and Ramp Rate Segment	Valid directions are: Upward, Downward, Both.			Y			Y

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For Quadrant:

REQ

Requesters:

Smart Grid Interoperability Panel

Request No.:

2010 REQ Annual Plan Item 9 (a-c)

Request Title:

Master Data Elements List for Business Practice Standards associated with NIST
PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	26	Ramp Rate Value	Ramp Rate associated with the selected Ramp Rate Type for the selected Ramp Rate Segment and Ramp Rate Direction	The NERC definition of Ramp Rate is the rate, expressed in megawatts per minute, by which a generator changes its output. For a Demand Resource, the Ramp Rate is the rate, expressed in megawatts per minute, by which a Demand Resource changes its Load.			Y			Y
8-Offer Parameters	8	30	Offer Dispatch Type	Type of Offer	Examples are Flexible (resource follows basepoint signals) or Fixed (resource requests DA commitment and RT schedules of 15 minutes or greater)			Y			
8-Offer Parameters	8	31	Offer Segment MW	Energy of Segment of the Offer	The end value of the offer step, monotonically increasing, expressed in MW (NOTE: When required as part of an enrollment request, this value becomes the default)			Y			
8-Offer Parameters	8	32	Offer Segment Price	Price of Segment of the Offer	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
8-Offer Parameters	8	33	Offer Segment Hour	Hour of Segment of the Offer	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
8-Offer Parameters	8	34	Startup Cost	Cost of starting a response activity	NOTE: When required as part of an enrollment request, this value becomes the default.			Y			
8-Offer Parameters	8	35	Strike Price	Threshold Price	Expressed as a decimal value of price/MW.			Y			
8-Offer Parameters	8	36	Offer Expiration Date	Date of Expiration of the Offer	This applies to DAM only.			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	37	Startup Cost Type	Type of startup cost	The type of Start Up Cost included in the offer. Options may include: Select cold, intermediate, hot or shutdown.			Y			
8-Offer Parameters	8	38	Offer Commit Status	Commitment status of offer	Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc.			Y			Y
8-Offer Parameters	8	39	Offer Dispatch Status	Dispatch Status of Offer	Product-specific commitment status types included with offer. Examples include: economic, emergency, not participating, not qualified, and self-schedule. May also be used to temporarily opt out of DR Events and to override the normal operational constraints. The opt-out can be specified using the following criteria: • All events in a program indefinitely (unspecified time period) • Specific DR Event • All events in a specific time period. • Other triggered programs for which an asset or DR resource is already called upon (reduce double counting of available capacity)			Y			Y
8-Offer Parameters	8	331	Offer Price Curve Slope	Flag to smooth offer segments from step function to slope				Y			

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	332	Strike Price Type	Type of strike price	Indicates the type of strike price. Options may include: buy or sell.			Y			
8-Offer Parameters	8	40	Market Clearing Day	Market Clearing Day of the Offer				Y			
8-Offer Parameters	8	41	Schedule Name	Name or tag of the Offer				Y			
8-Offer Parameters	8	42	Schedule Description	Description of the Offer				Y			
8-Offer Parameters	8	43	Schedule Status	Status of the Offer				Y			
8-Offer Parameters	8	50	Portfolio Name	Name of an aggregation of Resources for market participation				Y			
8-Offer Parameters	8	71	Constraint Type	Type of operational, schedule or offer constraint	Types of operational, offer or schedule parameters. Examples include: Select Operational Minimum Runtime, Schedule Minimum Runtime, Operational Maximum Runtime, Schedule Maximum Runtime, Minimum Load, Maximum Load, Minimum Downtime, Minimum Starts, Maximum Energy, Maximum Starts, Time of Day schedule constraints, Black out date, Maximum consecutive days of participation, Maximum calls per day, Minimum Advanced Notification, Minimum duration of participation, etc.			Y			Y

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
8-Offer Parameters	8	72	Constraint Interval	The timeframe over which the constraint type applies.	Typically daily, hourly, weekly, date			Y			Y
8-Offer Parameters	8	73	Constraint Value	Value of the Constraint Type and Interval				Y			Y
9-Energy Market	9		Energy Market								
9-Energy Market	9	0	Instruction ID	Unique identifier assigned to each instruction.				Y			
9-Energy Market	9	10	Energy Schedule - Start Time	Start Time of the Energy Schedule	A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).			Y			Y
9-Energy Market	9	11	Energy Schedule - End Time	End Time of the Energy Schedule	A Schedule is an energy profile for a Resource for a future time period, by scheduling time interval (typically hourly).			Y			
9-Energy Market	9	12	Energy Schedule - Interval Start Time	Start Time of the Energy Interval within the Energy Schedule	The start time of a specific energy schedule interval			Y			
9-Energy Market	9	13	Energy Schedule - Cleared MW Interval Value	The Energy Value of cleared MW for the Time Interval within the Energy Schedule	The offered energy MW that have cleared the market.			Y			
9-Energy Market	9	14	Energy Schedule - Cleared Price	Awarded Price	The market clearing price for the cleared energy MW.			Y			
9-Energy Market	9	15	Schedule ID	Unique identifier assigned to each schedule.				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	20	Base Point	Per-interval dispatch instruction	A Dispatch is a real-time instruction to a Resource to move to a Base Point at a specific time (Resource-Specific Deployment) or a set of real-time instructions to multiple Resources (Bulk Deployment). A Resource-Specific Deployment is the deployment, via established Communication Methods initiated by the System Operator, of one or more discrete and/or unique Resources designated to provide a selected service.			Y			
9-Energy Market	9	21	Breaker Status	Status of the Breaker for the Resource				Y			
9-Energy Market	9	22	Output MW	Real Power Output of the Distributed Generator	Expressed in MW			Y			
9-Energy Market	9	23	Output MVAR	Reactive Power Output of the Distributed Generator	Expressed in Mvar			Y			
9-Energy Market	9	24	DR Bus Load MW	Instantaneous Bus Load of a Demand Resource providing Ancillary Services	Demand is the rate at which electric energy is being used by the customer (NERC Definition). Expressed in MW. This element only applies to DR			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
9-Energy Market	9	25	Set Point	Final dispatch target level	The real-time desired MW output signal calculated for a specific Resource by the Transmission Provider's control system on a specified periodicity that is equal to the current Energy Dispatch Target plus the Regulating Reserve Deployment instruction (which may be positive or negative) plus an adjustment to the Energy Dispatch Target to account for Contingency Reserve Deployment Instructions. The Setpoint Instruction represents the desired output level of the Resource.			Y			
10-Ancillary Service Market	10		Ancillary Service Market								
10-Ancillary Service Market	10	0	Ancillary Service Instruction ID	Unique identifier assigned to each ancillary service instruction.				Y			
10-Ancillary Service Market	10	10	Ancillary Service Product Type	Type of Ancillary Service product(s) the Resource is enrolling to provide				Y			Y
10-Ancillary Service Market	10	11	Have Engineering Diagram	Flag set if One-Line Diagrams have been submitted				Y			
10-Ancillary Service Market	10	12	Ancillary Service Award - Start Time	Start Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
10-Ancillary Service Market	10	13	Ancillary Service Award - End Time	End Time of the ancillary service Award	A Schedule is an ancillary service profile for a Resource for a future time period, by scheduling time interval.			Y			
10-Ancillary Service Market	10	14	Ancillary Service Award - Interval Start Time	Start Time of the ancillary service Interval within the ancillary service Award and the ancillary service Value of the Time Interval	The start time of a specific ancillary service schedule interval			Y			
10-Ancillary Service Market	10	15	Ancillary Service Award - Interval Value	The awarded Value for the Time Interval within the ancillary service Award	The value associated with a specific ancillary service schedule interval			Y			
10-Ancillary Service Market	10	16	Ancillary Service Award - Cleared Price	Awarded Price	The market clearing price for the cleared ancillary service product MW.			Y			
10-Ancillary Service Market	10	17	Ancillary Service Schedule ID	Unique identifier assigned to each ancillary service schedule.				Y			
10-Ancillary Service Market	10	20	Ancillary Service Product Qualification Type	Type of Qualification	Examples include initial, requalification, etc.			Y			
10-Ancillary Service Market	10	21	Synchronization Test Date	Target Date of Test of Synchronization to the grid				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
10-Ancillary Service Market	10	22	Ancillary Service Product Type Qualification Date	Date of Qualification of the Resource				Y			
10-Ancillary Service Market	10	23	Ancillary Service Product Type Qualified	Type of Ancillary Service Product(s) for which the Resource has Qualified				Y			
10-Ancillary Service Market	10	24	Requalification Requirement	Flag set if Requalification is Required				Y			
10-Ancillary Service Market	10	31	Reserve Pickup Flag	Flag set if this is a Reserve Pickup schedule	Reserve Service is a type of Demand Response service in which Demand Resources are obligated to be available to provide Demand reduction Energy Service, based on reserve capacity requirements that are established to meet applicable reliability standards. Reserve Services are defined by short-term response rates (Ramp Period) and synchronization with the electricity grid (i.e., spinning and non-spinning reserves).			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
10-Ancillary Service Market	10	32	Regulation Base Point	Per-interval Regulation dispatch instruction	Regulation Service is a type of Demand Response service in which a Demand Resource corrects for short-term changes in electricity use that might affect the stability of the power system, matching generation and load to maintain a desired frequency. Demand Resources providing Regulation Service are subject to dispatch continuously during a commitment period. Provision of Regulation Service does not correlate to Demand Response deployment terms of the Event timelines, deadlines and durations.			Y			
10-Ancillary Service Market	10	33	Base Load MW	Level of Load at time of dispatch				Y			
11-Capacity Market	11		Capacity Market								
11-Capacity Market	11	10	Capacity Type	Type of Capacity	Capacity Service is a type of Demand Response service in which Demand Resources are obligated over a defined period of time to be available to deliver upon deployment by the System Operator or Service Provider. Examples: Hourly, Monthly, etc.			Y			Y
11-Capacity Market	11	11	Capacity Type Description	Description of the Type of Capacity				Y			Y
11-Capacity Market	11	20	Peak Value	Measurement of Peak				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
11-Capacity Market	11	21	Peak Type	Type of measurement of Peak	Examples are: Annual, Monthly, Weekly, and Seasonal.			Y			
11-Capacity Market	11	22	Peak Date/Time	Date and Time of measurement of Peak				Y			
11-Capacity Market	11	23	Nominal Capacity	Nominated load	Expressed as a decimal value.			Y			Y
11-Capacity Market	11	24	Qualified Capacity	Nominal installed capacity (ICAP) derated for performance	Derated based on past performance.			Y			Y
11-Capacity Market	11	30	Capacity Obligation Period Type	Type of Capacity Obligation Time Period within which the Resource is obligated	Examples are: All hours, Business hours 1, Business hours 2, Business Hours 3, Non-Business hours.			Y			
11-Capacity Market	11	31	Capacity Obligation Period	Period of time for which the Capacity Resource is Obligated	Examples include: month, season, year, etc.			Y			
11-Capacity Market	11	40	Minimum Payment Nomination	Strike price for the economic dispatch of the energy component of the capacity program	Expressed in Price/MW.			Y			
11-Capacity Market	11	41	Capacity Supply Obligation	Capacity Obligation	This may result from an auction or other clearing mechanism.			Y			
11-Capacity Market	11	50	Capacity Reference ID	Identifier assigned to the External System award	An Award is the selection of a Resource to provide energy, ancillary services, or capacity for a future time period. Expressed as a string.			Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
11-Capacity Market	11	991	Capacity Comments	Comments associated with the Capacity market				Y			
12-Event and Performance	12		Event and Performance								
12-Event and Performance	12	10	Event ID	Identifier assigned to the Event	An Event consists of the time periods, deadlines, and transitions during which Demand Resources perform. The System Operator shall specify the duration and applicability of a Demand Response Event. Some deadlines, time periods, and transitions may not be not applicable to all products or services.			Y			Y
12-Event and Performance	12	11	Deployment Type	Type of Deployment	Examples are: Advanced (Normal), Immediate, Audit/Test			Y			Y
12-Event and Performance	12	12	Event Day	Operating Date of Start of Event				Y			Y
12-Event and Performance	12	13	Event Description	Description of the Event				Y			
12-Event and Performance	12	14	Event Start Time	Time of Start of deployment period for Event	The Deployment Period is the period of time from the Deployment to Release/Recall.			Y			Y
12-Event and Performance	12	15	Operator Comment	Additional Event information provided by the Operator				Y			

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						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	16	Deployment MW	Absolute or relative Deployment quantity	Expressed as an absolute or relative (%) MW value.			Y			Y
12-Event and Performance	12	17	Event Status	Status of the Event	Examples include: initiated, completed, etc.			Y			Y
12-Event and Performance	12	18	Event End Time	Time of End of deployment period	Release/Recall is the notification, sent from the System Operator or Service Demand Response Provider to the Demand Resource, that the Deployment Period has ended or announcing the time that it will end.			Y			Y
12-Event and Performance	12	19	Event Modification Number	A modification number for the DR event. This is used to indicate if the DR Event has been modified by the Utility. Each time it is modified, this number is incremented.				Y			Y
12-Event and Performance	12	111	Notification Acknowledgement	This is an acknowledgement of the receipt of a DR notification or dispatch. It should include any necessary provisions for non-repudiation.				Y			Y
12-Event and Performance	12	112	Event Modification Reason Code	The reason the event is being cancelled or modified.				Y			Y

Late Comments Submitted by L. Tillman on behalf of Southern Compaies



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: REQ
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 REQ Annual Plan Item 9 (a-c)
Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	113	Load Level Value	Value of the load level to be achieved based on a set of enumerated values (e.g., moderate, high, etc.).							Y
12-Event and Performance	12	21	Baseline Dates	Dates of days used to calculate the Energy Baseline	The Baseline Window is the window of time preceding, and optionally following, a Demand Response Event, over which electricity consumption data is collected for the purpose of establishing a Baseline. The applicability of this term is limited to Meter Before/Meter After, and Baseline Type-I and Type-II.			Y			Y
12-Event and Performance	12	22	Baseline Exclusion Dates	Dates of days Excluded from the calculation of the Energy Baseline				Y			Y
12-Event and Performance	12	23	Energy Baseline Value	Calculated Energy Baseline	A Baseline is an estimate of the electricity that would have been consumed by a Demand Resource in the absence of a Demand Response Event. The Baseline is compared to the actual metered electricity consumption during the Demand Response Event to determine the Demand Modification Value. Depending on the type of Demand Response product or service, Baseline calculations may be performed in real time or after the fact.			Y			Y
12-Event and Performance	12	24	Energy Baseline Timestamp	Timestamp of Energy Baseline				Y			Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	30	Reporting Interval	Interval size required for Reporting				Y			Y
12-Event and Performance	12	31	Measurement Value Timestamp (CIM)	The time when the value was last updated				Y			Y
12-Event and Performance	12	32	Measurement Value (CIM)	Value of the interval reading				Y			Y
12-Event and Performance	12	33	Response Value	Response				Y			Y
12-Event and Performance	12	34	Measurement Value Type	The type of measurement value.	The Measurement Value Type identifies the type of information provided in the Measurement Value. For example, the Measurement Value type could be energy (kWh/MWh) or demand (KW or MW).			Y			
12-Event and Performance	12	50	Simple Signal Levels	Used as an alternate and simplified representation of the DR signal, whether it be price based or a dispatch. Takes on a small number of finite levels such as NORMAL, MODERATE, and HIGH, SPECIAL							Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
12-Event and Performance	12	51	Criticality Level	This field defines the level of criticality of this event. The action taken by load control devices for an event can be solely based on this value, or in combination with other Load Control Event fields supported by this device.	For example, additional fields such as Average Load Adjustment Percentage, Duty Cycle, Cooling Temperature Offset, Heating Temperature Offset, Cooling Temperature Set Point or Heating Temperature Set Point can be used in combination with the Criticality level. Criticality Level Level Description Participation 0 Reserved 1 Green Voluntary 2 1 Voluntary 3 2 Voluntary 4 3 Voluntary 5 4 Voluntary 6 5 Voluntary 7 Emergency Mandatory 8 Planned Outage Mandatory 9 Service Disconnect Mandatory 0x0A to 0x0F Utility Defined Utility						Y
12-Event and Performance	12	52	Usage Information	Information about the near real time electricity usage of the DR Resource.							Y
12-Event and Performance	12	991	Event & Performance Comments	Comments associated with Event and Performance data				Y			
13-Direct Load Control	13		Direct Load Control								

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Request Title: Master Data Elements List for Business Practice Standards associated with NIST PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
13-Direct Load Control	13	10	Status Check	A signal to require the DR resource status to be sent back. (Only applicable to Direct Load Control)							Y
13-Direct Load Control	13	11	DR Control Command: Direct Load Control Type	The type of DR Direct Load Control Command: e.g. Set Point, Open/Close, Heating Temperature - offset/setpoint, Cooling Temperature - offset/setpoint, Load adjustment offset							Y
13-Direct Load Control	13	12	DR Control Command: Direct Load Control Value	Value associated with the Direct Load Control Type.							Y
13-Direct Load Control	13	13	Duty Cycle	"Duty Cycle : Defines the maximum On state duty cycle as a percentage of time. Example, if the value is 80, the device would be in an "on state" for 80% of the time for the duration of the event. Range of the value is 0 to 100. A value of 0xFF indicates the field							Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
				is not used." (from SEP2.0)							
13-Direct Load Control	13	14	Event Control	Event Control options for randomized start or end times: 1= Randomized Start time, 0=Randomized Start not Applied 1= Randomized End time, 0=Randomized End not Applied. (from SEP2.0)							Y
13-Direct Load Control	13	15	Exception Conditions	This is used to report that the load controller may not behave as commanded because of a variety of conditions including: • Faults in device • Customer override.							Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
13-Direct Load Control	13	16	Load Control State	The state of the load, which includes both commanded states and user settings. This may include a schedule of future states if a particular control algorithm for the load controller is being executed.							Y
14-Price and Product	14		Price and Product								
14-Price and Product	14	10	Product Name	Same as 7.13 Market Product	An identifier for a particular electricity product offering: energy, capacity, ancillary services, etc.	Y					
14-Price and Product	14	11	Product Type	Defines the source and product	Classifications used within industry for trading energy. Examples: PJM Energy, NYISO 10-min Spin, etc.	Y					Y
14-Price and Product	14	12	Product Sub-type	Used to further define product types		Y			Y		
14-Price and Product	14	13	Identifier Source (product)	The Identifier Source references the product identification scheme for the Product Identifier.		Y					
14-Price and Product	14	14	Unit of Measure	Attribute of Product Identifier		Y					Y

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Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
14-Price and Product	14	15	Currency	Economic unit of exchange in which the total price and price components are stated (e.g. dollars, euros)		Y			Y		Y
14-Price and Product	14	20	Product Identifier	Identifies specific product associated with the price		Y			Y		
14-Price and Product	14	30	Override Unit of Measure	Optional Attribute of Price object If this is used, then Unit of Measure is not applicable		Y					
14-Price and Product	14	31	Product Price	The sum of all Price Component Values for a given product (Total Price).		Y					Y
14-Price and Product	14	32	Product Price Factor	Terms of use attribute of Product Price	Examples: Price_absolute, Price_relative, Price_multiplier	Y			Y		
14-Price and Product	14	33	Price Component Type	The portion of the price to which the corresponding value applies.	Examples: Energy, congestion, losses	Y					
14-Price and Product	14	34	Price Component Value	The value of the price component.		Y					
14-Price and Product	14	35	Price Location	The location at which the price is applicable.		Y					
14-Price and Product	14	36	Price Type	Time characteristic of the price	The type of price (day-ahead, real-time, etc.).	Y					

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RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant:

REQ

Requesters:

Smart Grid Interoperability Panel

Request No.:

2010 REQ Annual Plan Item 9 (a-c)

Request Title:

Master Data Elements List for Business Practice Standards associated with NIST
PAP 03 and PAP 09

Category	Category ID	Category Element ID	Data Element	Short Description	Long Description	Wholesale			Retail		
						PAP 03	PAP 04	PAP 09	PAP 03	PAP 04	PAP 09
14-Price and Product	14	37	Delivery Time	Time at which the product is available for physical consumption		Y			Y		Y
14-Price and Product	14	38	Delivery Interval	The duration over which the product is available for physical consumption		Y			Y		Y
14-Price and Product	14	40	Source Location Identifier	The identifier of the source location of the product for which the price applies		Y			Y		
14-Price and Product	14	41	Source Location Identifier Type	The type of source location of the product for which the price applies		Y					



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: ~~Wholesale Electric Quadrant~~ **REQ**
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 6 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03, PAP 04 and PAP 09

4. Supporting Documentation

a. Description of Request:

2010 REQ Annual Plan Item 9 and 2010 REQ Annual Plan Item 6 – “Develop Smart Grid Wholesale and Retail Electric Standards”

b. Description of Recommendation:

This recommendation provides the data elements related to the use cases developed for Priority Action Plan 03 and 09 as part of the phase one effort

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the development of standard DR and DER signals.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- March 11, 2010 Meeting Notes – To be posted
- March 18, 2010 Meeting Notes – To be posted
- March 25, 2010 Meeting Notes – To be posted
- April 1, 2010 Meeting Notes – To be posted
- April 8, 2010 Meeting Notes – To be posted
- April 29, 2010 Meeting Notes – To be posted
- May 13, 2010 Meeting Notes – To be posted
- May 20, 2010 Meeting Notes – To be posted
- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes – To be posted
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: ~~Wholesale Electric Quadrant~~**REQ**
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 6 (a-c)
Request Title: Master Data Requirements List for Business Practice Standards associated with NIST PAP 03, PAP 04 and PAP 09

- August 26, 2010 Meeting Notes – http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc
- September 9, 2010 Meeting Notes – http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes – http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes – To be posted



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

1. RECOMMENDED ACTION:

☒ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The business process flows, use cases and data requirements presented in this document illustrate the standard interactions between Utility Distribution Operator, Service Provider (Demand Response) and Utility Customer for the administration and deployment of demand response resources retail markets.

RECOMMENDED STANDARDS:

In response to NIST's Priority Action Plan 9, this document provides requirements specification, in the form of business process flows, use cases and data requirements in certain areas, to support the standardization of the information exchange between Utility Distribution Operator, Service Provider (Demand Response) and Utility Customer. This document shares a standard set of actors and terminologies with the companion Requirements Specification for Wholesale Standard DR Signals.



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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REQ.17.2.B

New REQ.17.2.B Defined Terms to be added to REQ.17 are included in the Recommendation Request Titled Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03 to avoid redundancy between recommendations.

RECOMMENDED STANDARDS:

Executive Summary

Specifications for Retail Standard Demand Response Signals

The North America Energy Standards Board (NAESB) Smart Grid Standards Subcommittee took the responsibility of consolidating and developing DR use cases that provide requirements for developing DR control and pricing signal standards, which is called for by National Institute of Standards and Technology (NIST) Priority Action Plans (PAP) 03 and 09. This document addresses the business and data requirements for standardizing control and pricing signals for Retail level Demand Response (DR) and Distributed Energy Resources (DER) as part of the Smart Grid implementation. Wholesale market DR and DER information exchanges are outside the scope of this document and are addressed in the Requirements Specification for Wholesale DR signals. The first step of use case development is the development of the Framework for Integrated DR and DER Models document, which provides an overall business context for DR and DER Models.

According to the Framework Document findings:

1. DR signals standardization must support all four market types; i.e. regions with a) no open wholesale and no retail competition, b) open wholesale market only, c) open retail competition only, d) open wholesale and open retail competition. It must also consider key differences that exist and will continue to exist in all four market types.
2. Wholesale market DR and pricing signals have different characteristics than retail market DR and pricing signals, although commonality in format is feasible.
3. Most Customers (with a few exception of Commercial and Industrial (C&I) Customers) will not interact directly with wholesale market when it comes to DR and pricing signals.
4. Retail pricing models are complex, due to the numerous tariff rate structures that exist in both regulated and un-regulated markets. Attempts to standardize DR control and pricing signals must not hinder regulatory changes or market innovations when it comes to future tariff or pricing models.
5. New business entities (Energy Service Providers (ESP), Demand Response Providers (DRP), Service Providers, and Energy Information Service Providers (ESIP)) as well as new customer energy management systems will play an increasing role in DR implementation.
6. DER may play an increasingly important role in DR, yet the development of tariff and/or pricing models that support DER's role in DR is still in its infancy.



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7. The Customer's perspective and ability to react to DR control and pricing signals must be a key driver during the development of DR standards.

The following deals exclusively with the retail level demand response signals requirements. The requirements are captured in the form of UML models, where business requirements are captured in Use Case narrative format, data requirements are captured in tabular format, and information exchange flows are captured in sequence diagram format. The top level use cases for retail DR are:

1. Administrate DR Program
2. Administrate Customer for DR
3. Administrate DR Resource
4. Execute DR Event
5. Post DR Event Management

Introduction

Specifications for Retail Standard Demand Response Signals

This Model Business Practice and data elements included herein are not intended to replace applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this Model Business Practice.

Purpose: The purpose of the following is to capture business and data requirements for Retail Level DR signals between entities that control and manage the DR programs and entities that provide demand response with DR resources and assets. This is to fulfill the NAESB SGTF responsibility under the NIST Smart Grid Interoperability Standards development PAP09. This requirements document will then be used by other standards development organizations identified by NIST PAP09 for further development of DR signals technical specifications for both C&I customer and residential customer markets.

Scope: The scope of the following is to provide business and data requirements for standardizing Demand Response signals at the retail (distribution) level.

Commentary on Distributed Energy Resources: In the context of this report, Distributed Energy Resources (DER) are dispatchable energy generation and storage technologies, typically up to ten MWs in size, that are interconnected to the distribution grid to provide electric capacity and/or energy to a customer or a group of customers and potentially export the excess to the grid for economical purposes. DER systems can generate electric power, as opposed to curtailable or interruptible loads that can just reduce electric loading on the grid.

DER may be subdivided into distributed generation (DG), distributed storage, and plug-in electric vehicles (PEVs):

Distributed generation (DG) technologies can be divided into a) **Renewable Generation**, e.g., small wind power systems, solar photovoltaic (PV), Fuel Cells, Bio-fuel generators and Digesters, and other generation resources using renewable fuel, and b) **Non-Renewable**



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Retail Standard DR Signals – for NIST PAP09

Generation, e.g., micro-turbines, small combustion turbines, diesel, natural gas and dual-fueled engines, etc.

Storage resources could be divided into a) **Electric Storage**, e.g., battery systems and uninterruptible power supplies (UPS), flywheel, superconducting magnetic energy storage (SMES), etc. and b) **Thermal Storage** – These convert electric power to thermal (cooling/heating) energy for later use, e.g., Ice-based air cooling system, and high-capacity brick-based air heating system.

Plug-in electric and hybrid vehicles (PEV/PHEV) may also be considered as DER. The electric vehicles may be used to supply stored electric energy back to the grid, a.k.a. Vehicle-to-grid (V2G).

Behind-the-meter DER may be bundled with regular load and managed alongside the demand response resources – such as a residential roof-top PV solar panel. But often, DER is treated separately in part due to its control capabilities. In addition to a regular retail tariff, behind-the-meter DER may be subject to net-metering or feed-in tariff, where excess generation can be exported to the grid at an established or a dynamic price.

Similar to DR resources, DER assets need to be registered and enrolled into a DR program. Furthermore, DER assets are typically required to meet additional technical requirements and certification for grid interconnection. Depending on the size of a DER and its export capabilities, sub-metering and telemetry capabilities may be required to monitor the impact of the DER operation on the distribution grid reliability and power quality. Also, renewable resources may receive Renewable Energy Credits (RECs) and may also qualify as a must-run resource, e.g., wind power in some regions. These need to be incorporated into pricing and control signals associated with DER operation.



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Model Business Practices

REQ.17.3.1 Specifications for Retail Standard Demand Response Signals

The following describes general business processes for implementing demand response capacities at the retail market level. The following principles apply to the development and application of these business process requirements.

#	Name	Description	Rationale	Implication
1	Scalability	The architecture should allow for the management of millions of Customer premises devices	Scale-out, adding more low-cost machines, has proven to be superior to scale-up, using larger single machines, as a way to handle large loads. For example, high traffic web sites use farms of low-cost machines to serve pages to millions of simultaneous web users.	Architecture should allow the solution to scale-out as more devices are added.
2	Actionable, testable, and transferable work products	Any work (artifacts) that are created can be used by the audience for this work, e.g., utilities, vendors, regulators, etc. There needs to be clear, explicit guidance for how to use the artifacts. There is an expectation that the work products are useful at lower levels of design.	Such work products will promote market adoption and minimize the cost and risk of adoption, leverage open and best practices, and establish repeatable processes, patterns, and templates for all work products.	The use of common tools and methods will be fostered. Organizations that do not follow the use of the common tools and methods may have more difficulty implementing the artifacts.



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#	Name	Description	Rationale	Implication
3	Platform Independence, Vendor Neutral	Requirements and design artifacts shall be platform independent. Implementation technology shall be chosen due to its level of acceptance at the marketplace as open standards.	There is an expectation of differentiation and innovation in the marketplace. With greater dependence on a specific platform, there may be less architectural flexibility.	To achieve both technical and semantic interoperability, certain lower level technologies will need to be chosen. For example, Web Services technology is widely used for integration, and UML is widely used for modeling.
4	Cyber Secure	Architecture must incorporate latest secure computing techniques.	The integrity of the electric grid and market depend on preventing unauthorized actors from manipulating the DR and DER system.	Architecture must comply with the latest security guidance from the NIST SGIP Architecture Committee and CyberSecurity Task Group, when it comes to Web Services security related implementation.
5	Interoperability	DR signaling standards should utilize open, interoperable industry standard control and communication technologies to integrate with both common energy management and control systems that can conduct DR activities	Interoperability across different domains of Smart Grid is key to the success of DR signaling standards as it ensures level playing field for innovative solutions for all participants of the Smart Grid.	DR signaling standards must be developed in harmonization with others relevant standards as identified by the NIST SGIP.



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#	Name	Description	Rationale	Implication
6	Automatic Demand Response	The DR program (analysis, notification, event, action, monitoring, verification, settlement) should be automatic. DR signaling standards should provide secure, reliable communications with consumers for DR operations	Automation is the only way to ensure large scale and repeatable demand response implementation.	Security, reliability and testability must be ensured for DR automation.
7	Cover All Market Types	DR signaling standards should be supported and implementable in all four market types listed in this document	Standards development shall not get in the way of regulatory policy decisions.	DR signals design need to support a wide range of programs and tariff/pricing structures.

REQ.17.3.1.1 Conventions

The use case modeling technique is used for capturing business and data requirements relative to Retail Demand Response. There are two basic diagrams used in this document. The first one is the use case diagram, which shows the scope of business use cases for a given business scenario. The relationships used in the Use Case diagrams are as follows:

- Include: this indicates additional scenarios
- Extend: this indicates alternatives scenarios
- Generalization (line with triangle head): this indicates variations (sub-types) of the main use case.
- Precedes: this indicates a time sequence
- Invokes: this indicates a pre-condition or dependency

The second is the sequence diagram, which shows the information exchange flows between actors for a given use case. The message flows are shown in one way with the convention of verb and noun, verb indicating the action being taken, noun indicating the name of the information being exchanged. The return message flow is the acknowledgement of the main message flow.

REQ.17.3.1.2 ACTORS

The actors listed in the table below are specific to this Model Business Practice and are a subset of the actors and related objects defined in WEQ-000. Details on the relationships between the actors and related objects are further defined in Appendix A.



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Table 1 - Actor Roles

Term	Actor ID ¹
Communication Method	5.5
Control	5.2
Designated Dispatch Entity	3.4
Designated Dispatch Entity (DDE)	3.4
End Device (ED)	4.5
Enrollment	5.3
Environmental Authority (EA)	1.3
Federal Regulator (FR)	1.1
Load Serving Entity	3.2
Load Serving Entity (LSE)	3.2
Local Authority (LA)	1.5
Market Participant (MP)	2.2

¹ The Actor ID shown in the table refers to the item number of the corresponding actor or related object in the Entity-Relationship Diagram provided in Appendix A. Definitions of the actors and related objects are included in REQ.17.2



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Term	Actor ID ¹
Measurement	5.1
Metering Authority	3.6
Metering Authority (MA)	3.6
P-Node	5.6
~~Premise~~ <u>Service Location</u>	4.3
Reliability Authority (RA)	1.2
Resource	4.1
Scheduling Entity	3.3
Scheduling Entity (SE)	3.3
Service Provider	3.1
Service Provider (SP)	3.1
State Regulator (SR)	1.4



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Term	Actor ID ¹
System Operator	2.1
Transmission/Distribution Service Provider	3.5
Transmission/Distribution Service Provider (TDSP)	3.5
Utility Customer (UC)	2.4
Utility Distribution Operator (UDO)	2.3
Zone	5.4

REQ.17.3.1.3 Use Case Overview

Similar to the Wholesale Demand Response use cases, Retail Demand Response use cases generally follow five main steps, see the Figure 1².

1. Administrate DR Program
2. Administrate Customer for DR
3. Administrate DR Resource
4. Execute DR Event
5. Post DR Event Management

There are many programs that exist in today's retail markets with or without open competition. New programs will be defined and deployed in the future. The goal of this use case analysis is to find commonalities among these

² DR program administration related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from the final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the customer enrollment and DR program administration related business practices.



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programs so that the derived DR signal messaging specification can be implemented to support a large number of DR programs.

The focus of the Standardized DR Signals is the step 4, Execute DR Event, where the DR signals will be communicated between the DR Providers and the DR resources. All other use cases are supporting materials to ensure that DR use case requirements are documented and understood in a complete picture.

The use cases included in this document are not intended to be required or exhaustive and are provided for clarification purposes.

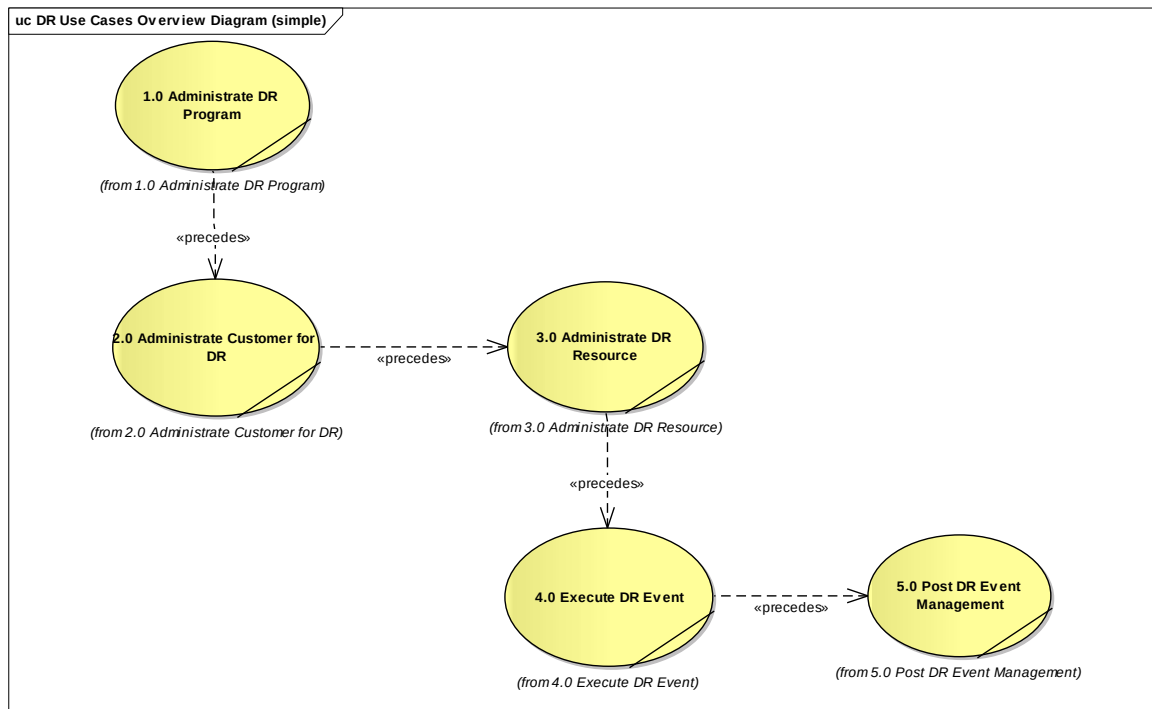


Figure 1. Retail Market DR Use Case Overview



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REQ.17.3.1.4 Specific Use Cases

REQ.17.3.1.4.1 Administrate DR Program

DR program administration related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from the final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the customer enrollment and DR program administration related business practices.

REQ.17.3.1.4.2 Administrate Customer for DR

DR program customer enrollment related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from the final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the customer enrollment and DR program administration related business practices.

REQ.17.3.1.4.3 Administrate DR Resource

DR Resource is an equivalent of Resource defined in the actor list table.

As part of enrolling customers to a DR program, specific DR resources and assets that are associated with customers' accounts and premises will also need to be registered. Figure 4 shows the actors and use cases involved in administering DR resources and/or assets into DR programs. The following use cases deal with the registration, update, and removal of DR resources and assets associated with a customer. When updating DR resources, there will also be potential use cases of DR bidding process, either for supplying or for buying power. There are also cases where Distributed Energy Resources will act as DR assets.



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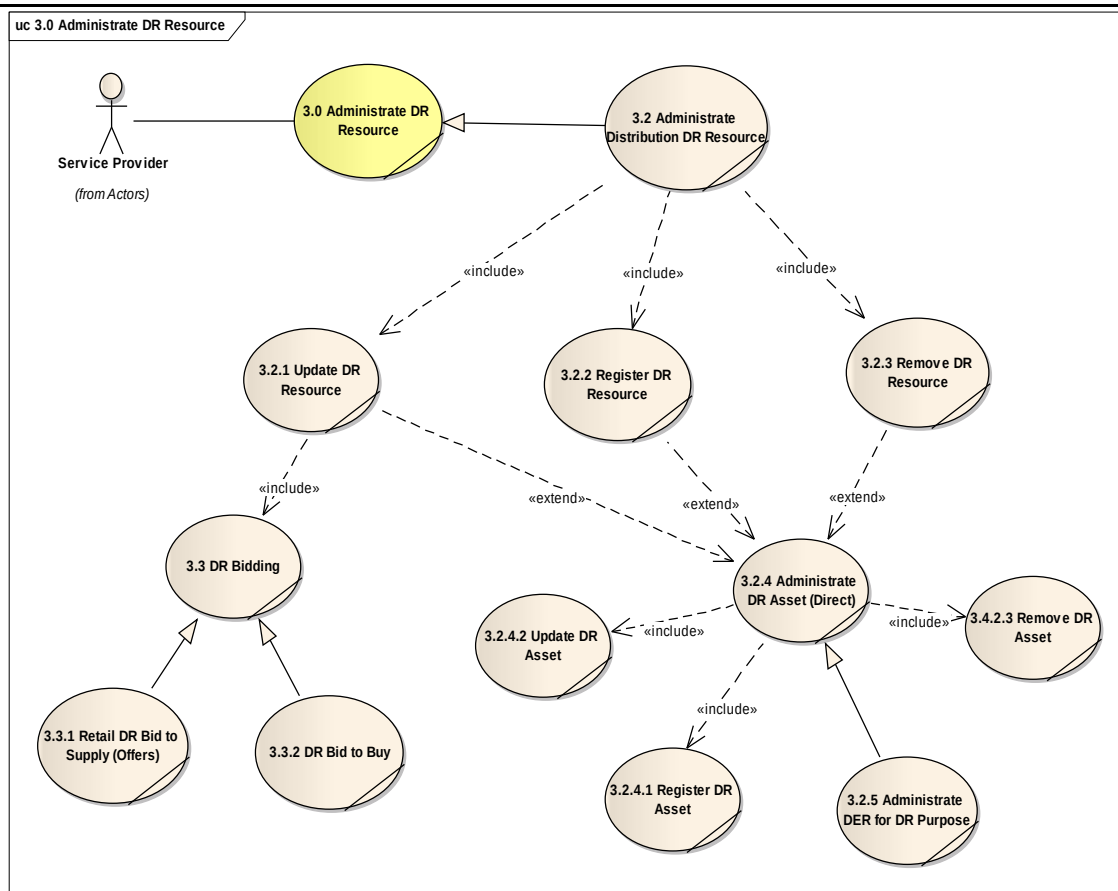


Figure 2. Administrate DR Resources and/or Assets into DR Programs

REQ.17.3.1.4.3.1 Administrate Distribution DR Resource

These activities are used to administer all of the DR Resources and Assets, including a variety of activities surrounding the registration of DR Resources and the management of information surrounding the DR Resources that a Service Provider may call upon during a DR event. Before a DR Resource may be called upon, it must be registered with the Service Provider. The administration of a DR Resource covers the following requirements:

- The need of the Service Provider to identify a DR Resource for communications purposes;
- The need of the Service Provider to establish DR Resource accounts for accounting purposes;
- The need of the Service Provider to collect information from DR Resources prior to DR events for the purposes of determining which DR Resources to call upon during a DR



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Event; and

- The need of the Service Provider to collect information from DR Resources prior to DR events for the purposes of determining the nature of the DR signals to send to the DR Resources.

REQ.17.3.1.4.3.2 Update DR Resource

Description

When the base capacity of a DR Resource changes from when it was last registered with the DR provider, customer needs to provide updated information to the DR provider so that such information can be factored into the consideration for DR event planning.

Data Requirements

<u>Attribute Name</u>	<u>Description</u>
<u>Resource ID</u>	<u>Identifier assigned to the Resource</u>
<u>Resource Type</u>	<u>Type of Resource. Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, and storage.</u>
<u>Transmission/Distribution Service Provider Account Number</u>	<u>Transmission/Distribution Service Provider's (Utility) account number for the Resource.</u>
<u>Demand Response Provider</u>	<u>The entity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response products.</u>
<u>DR Resource Group ID</u>	<u>Grouping of Resources that can respond to the same DR Signal.</u>
<u>Program Identifier</u>	<u>The identifier of the program</u>
<u>Constraint Type</u>	<u>Type of operational, schedule or offer constraint</u>
<u>Constraint Interval</u>	<u>The timeframe over which the constraint type applies.</u>
<u>Constraint Value</u>	<u>Value of the Constraint Type and Interval</u>
<u>Effective Enrollment Date</u>	<u>Effective Start Date for the Enrollment</u>
<u>Location</u>	<u>The location of a Resource defined by one or more of the following attributes:</u>
<u>Location Attributes</u>	



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<u>Attribute Name</u>	<u>Description</u>
<u>Service Location ID</u>	<u>Identifier assigned to the Service Location</u>
<u>Address1</u>	<u>Address line 1</u>
<u>Address2</u>	<u>Address line 2</u>
<u>City</u>	<u>City</u>
<u>State/Province</u>	<u>State or Province two-letter code</u>
<u>Zip/Postal Code</u>	<u>Zip or Postal Code</u>
<u>Country</u>	<u>Country</u>
<u>GPS Coordinates</u>	<u>Latitude and longitude</u>
<u>Weather Station</u>	<u>Weather Station code associated with the Service Location</u>
<u>Zone ID</u>	<u>Identifier assigned to the Zone in which the Service Location is located</u>
<u>Zone</u>	<u>Name of the Zone in which the Service Location is located</u>
<u>Electrical Node ID</u>	<u>Identifier assigned to the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Name</u>	<u>Name of the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Type</u>	<u>Type of Electrical Node at which the Service Location is attached</u>
<u>PNode</u>	<u>Name of the Price Node associated with the Service Location</u>
<u>PNode ID</u>	<u>Identifier assigned to the Price Node associated with the Service Location</u>
<u>End of Location Attributes</u>	
<u>Response Time</u>	<u>The amount of time before an asset/resource is capable of meeting its full performance, in response to a request by a Service Provider to shed load.</u>
<u>Capacity Type</u>	<u>Type of Capacity</u>
<u>Capacity Type description</u>	<u>Description of the Type of Capacity</u>
<u>Nominal Capacity</u>	<u>Nominated load</u>

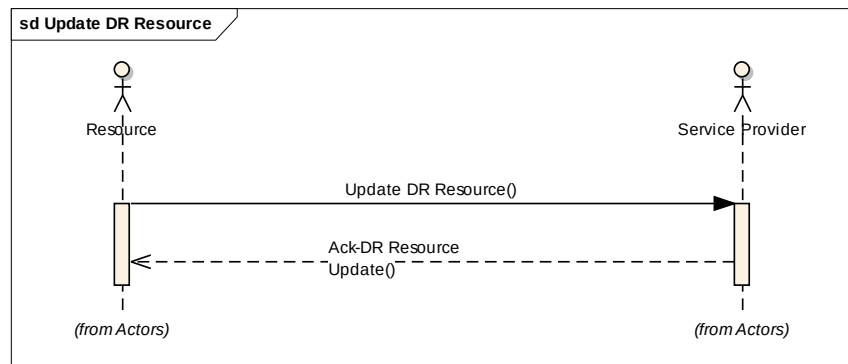


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Attribute Name	Description
<u>Offer Commit Status.</u>	<u>Commitment status of offer</u> <u>Product-specific commitment</u> <u>status types included with offer.</u> <u>Examples include: economic,</u> <u>emergency, must-run, not</u> <u>participating, outage run status,</u> <u>override status, etc.</u> <u>Also referred to as "opt-in" or</u> <u>"opt-out" for existing Demand</u> <u>Response Programs.</u>
<u>Resource Type</u>	<u>Type of Resource</u> <u>Examples are: load reduction</u> <u>(curtailable or interruptible load),</u> <u>generation, combination, DG,</u> <u>renewable, storage, etc.</u>
<u>Resource Qualification Test Date</u>	<u>Date the Resource demonstrated</u> <u>its ability to deliver a product or</u> <u>service</u>
<u>Requalification Test Date</u>	<u>Date the Resource will retest its</u> <u>ability to deliver a product or</u> <u>service</u>
<u>Enrollment End Date</u>	<u>Date of Termination of</u> <u>Enrollment</u>
<u>Enrollment Status</u>	<u>Status of the Enrollment for the</u> <u>Resource</u>

Sequence Diagram



REQ.17.3.1.4.3.3 Register DR Resource

Description

A party with ownership, controlling interest, or administrative responsibilities for a DR Asset or DR Resource that communicates status-related operational information about the



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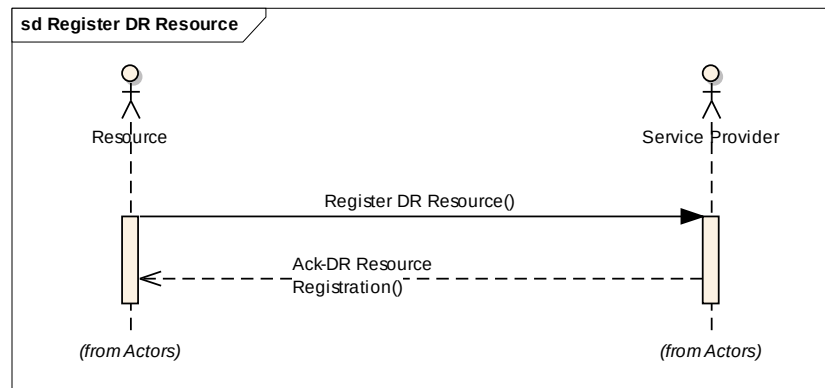
For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
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DR Asset or DR Resource to a Service Provider. For example, the owner of a DR Resource or Asset may wish to declare their inability to shed load (an outage) due to summer shutdown or may wish to reduce the available capacity of a resource/asset due to equipment maintenance or other causes.

Data Requirements

The Data Requirements are the same for Register / Enroll DR Resource and Update DR Resource.

Sequence Diagram



REQ.17.3.1.4.3.4 Remove DR Resource

Description

When a DR resource is no longer available permanently for DR purpose, it needs to be removed from the DR program for that customer so that it will be accounted for DR event planning.

Data Requirements

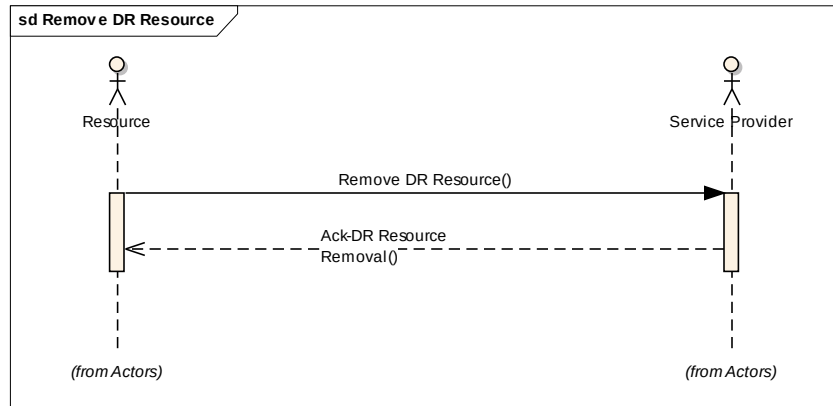
<u>Attribute Name</u>	<u>Description</u>
<u>Resource ID</u>	<u>Identifier assigned to the Resource that is removed.</u>
<u>Program Identifier</u>	<u>The identifier of the program</u>
<u>Enrollment End Date</u>	<u>Date of Termination of Enrollment</u>
<u>Enrollment Status</u>	<u>Status of the Enrollment for the Resource (Set to 'REMOVE')</u>



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Sequence Diagram





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REQ.17.3.1.4.4 Administrate DR Asset (Direct)

REQ.17.3.1.4.4.1 Register DR Asset

Description

The DR Asset registration process must capture key identifiers to enable accurate tracking of DR assets and their capabilities. A requirement for a System and Market Operator, Load Serving Entity, Service Provider, or other entity facilitating the registration process (hereinafter referred to as DR Asset Administrator) is to track assets. This is done through DR asset registration and association of physical DR assets to DR Resources to recognize the asset and its potential contribution as part of a DR Resource. The DR Asset Administrator ultimately administers the DR Asset registration process to recognize DR Assets that can serve as part of a DR Resource, although the Customer may be party to the registration process.

Data Requirements

<u>Attribute Name</u>	<u>Description</u>
<u>Asset ID</u>	<u>The unique identifier of the asset</u>
<u>Program Identifier</u>	<u>The identifier of the program</u>
<u>DR Asset Group ID</u>	<u>Grouping of Assets that can respond to the same DR Signal within a DR Resource. (See DR Resource Specification)</u>
<u>Asset Operator ID</u>	<u>The identifier of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.</u>
<u>Asset Operator Name</u>	<u>The name of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.</u>
<u>Asset Owner ID</u>	<u>The Identifier of the business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).</u>
<u>Asset Owner Name</u>	<u>The Name of business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).</u>
<u>Location</u>	<u>The location of a Resource defined by one or more attributes:</u>
<u>Service Location ID</u>	<u>Identifier assigned to the Service Location</u>
<u>Address1</u>	<u>Address line 1</u>



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<u>Attribute Name</u>	<u>Description</u>
<u>Address2</u>	<u>Address line 2</u>
<u>City</u>	<u>City</u>
<u>State/Province</u>	<u>State or Province two-letter code</u>
<u>Zip/Postal Code</u>	<u>Zip or Postal Code</u>
<u>Country</u>	<u>Country</u>
<u>GPS Coordinates</u>	<u>Latitude and longitude</u>
<u>Weather Station</u>	<u>Weather Station code associated with the Service Location</u>
<u>Zone ID</u>	<u>Identifier assigned to the Zone in which the Service Location is located</u>
<u>Zone</u>	<u>Name of the Zone in which the Service Location is located</u>
<u>Electrical Node ID</u>	<u>Identifier assigned to the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Name</u>	<u>Name of the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Type</u>	<u>Type of Electrical Node at which the Service Location is attached</u>
<u>PNode</u>	<u>Name of the Price Node associated with the Service Location</u>
<u>PNode ID</u>	<u>Identifier assigned to the Price Node associated with the Service Location</u>
<u>Effective Enrollment Date</u>	<u>Effective Start Date for the Enrollment (Registration)</u>
<u>Enrollment Status</u>	<u>Status of the Enrollment for the Asset</u>
<u>Offer Commit Status</u>	<u>Commitment status of offer</u> <u>Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc.</u> <u>Also referred to as "opt-in" or "opt-out" for existing Demand Response Programs.</u>
<u>DR Asset Physical Capabilities</u>	<u>Asset Capabilities include Ramp Rates and Capacity.</u>
<u>Ramp Rate Value</u>	<u>Ramp Rate associated with the selected Ramp Rate Type for the selected Ramp Rate Segment and Ramp Rate Direction</u>
<u>Capacity Type</u>	<u>Type of Capacity</u>

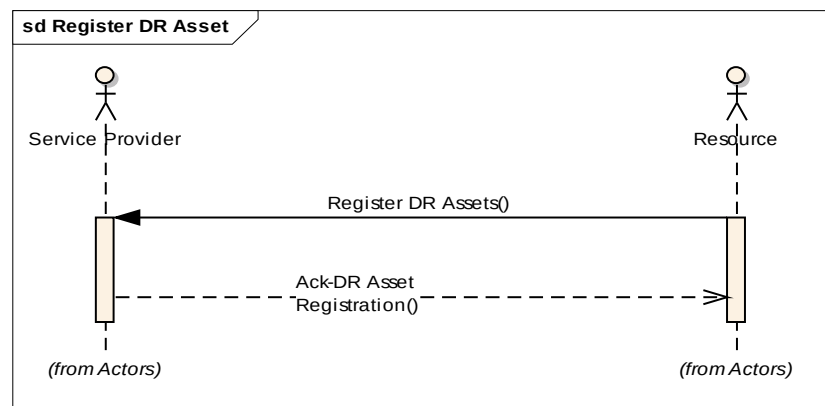


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<u>Attribute Name</u>	<u>Description</u>
<u>Capacity Type description</u>	<u>Description of the Type of Capacity</u>
<u>Nominal Capacity</u>	<u>Nominated load</u>
<u>Asset Manufacturer</u>	<u>Manufacturer of the Asset</u>
<u>Asset Model</u>	<u>Model Identifier of the Asset assigned by the Manufacturer</u>
<u>Asset Version</u>	<u>Model Version Identifier assigned by the Manufacturer.</u>
<u>Asset Manufacture Date</u>	<u>Date of Manufacture of the Asset</u>
<u>Asset Type</u>	<u>Type of Asset.</u> <u>Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.</u>
<u>DR Resources</u>	<u>The identifier of DR resources that the DR Assets belong to. An Asset can associate with multiple Resources, but with only one Resource for a DR Program.</u>

Sequence Diagram





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REQ.17.3.1.4.4.2 Update DR Asset

Description

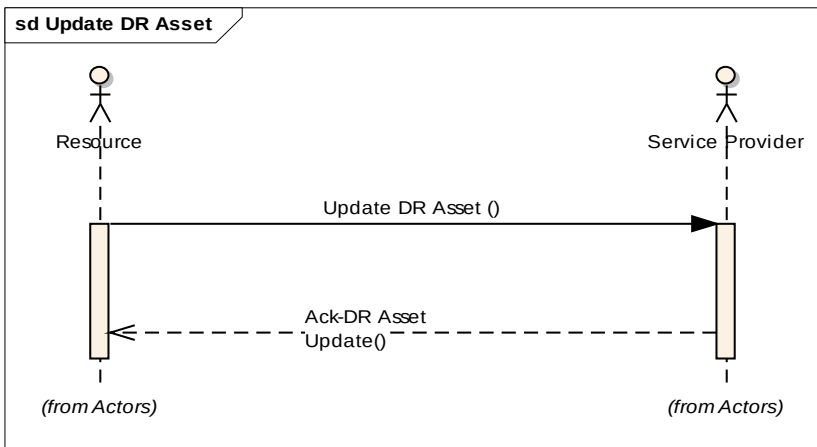
Once a DR asset registration is completed, changes to elements of the registration may be required or desired. After identifying the specific required modification and verifying the authorization to perform the update, each of the considerations identified in the DR Asset registration step should be evaluated and utilized, where necessary, during the update of the DR Asset information. The ability to update DR Asset information helps to ensure the asset information on record is current and complete.

Parties that are privy to and rely on the update should be notified of updates as soon as practicable after they are made. Additionally, these parties should have access to review and, in some cases, to approve/disapprove the update(s).

Data Requirements

The Data Requirements are the same for Register / Enroll DR Asset and Update DR Asset.

Sequence Diagram





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REQ.17.3.1.4.4.3 Remove DR Asset

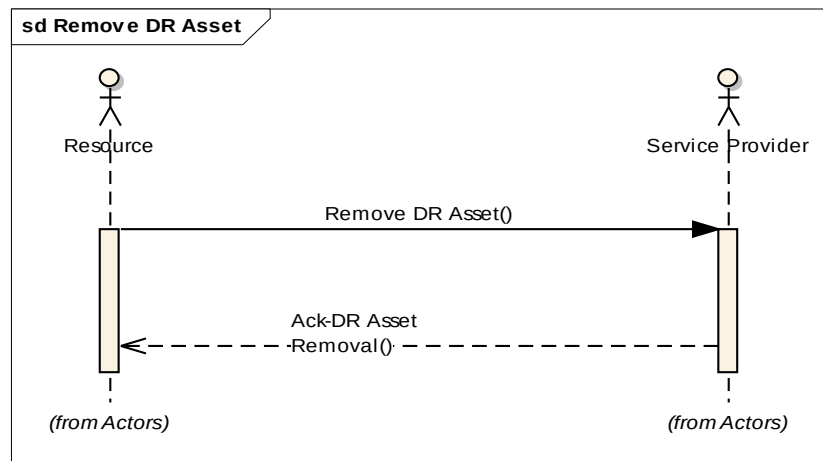
Description

Removing a DR Asset must take into account any DR Resource long term commitments in System Operator programs and contractual obligations with Service Providers or Load Serving Entities. In addition, applicable regulatory agency filings and approvals must be considered prior to removing a DR Asset from a DR program.

Data Requirements

<u>Attribute Name</u>	<u>Description</u>
<u>Asset ID</u>	<u>The unique identifier of the asset</u>
<u>Program Identifier</u>	<u>The identifier of the program</u>
<u>Enrollment End Date</u>	<u>Date of Termination of Enrollment</u>
<u>Enrollment Status</u>	<u>Status of the Enrollment for the Asset ('REMOVE')</u>

Sequence Diagram





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REQ.17.3.1.4.5 DR Bidding

Description

Demand Response Bidding occurs after the DR Assets and Resources that are to comprise the desired bid have been registered and a bid or an offer is to be formed. The DR Bidding use case has two sub-use cases, depending on the type of bid to be developed for submission: a bid to supply (i.e., an offer), or a bid to buy. The entity operating the DR bidding program (the Bid Receiver) receives bids from participants (the Bidders). The Bidder may be a Customer bidding with either an energy retailer (e.g., LSE, ESP), a Service Provider (e.g., CSP, DRP), or a power marketer (i.e., wholesale market participant). The Bidder may also be a Service Provider bidding up to a LSE or power marketer.

Before the start of the bidding process, it is assumed that DR Resources available for selection are already registered to provide the physical resource participating in the DR Bidding program. It is also assumed that the bidder has already registered to bid with the bid receiver and has been informed on the appropriate timing and parameters for bid participation. The DR bidding process starts with the decision of the Bidder to develop a bid for submission. The Bidder submits its bid to the Bid Receiver within the appropriate time window and following set guidelines for bidding. The Bidder receives information on the outcome of the submitted bid from the Bid Receiver, who notifies of the bid outcome (e.g., a resource award or other DR commitment).

Examples of retail DR Bidding programs include:

- Demand Bidding
- Capacity Bidding

REQ.17.3.1.4.5.1 DR Bid to Supply (Retail Offers)

Description

The Bid Receiver opens the forum/venue for receiving an offer. (This may include initiating the bidding process by sending initial information to Bidders indicating parameters of acceptability for bids to be made). The Bidder communicates an offer to supply a specified product/service and the pricing or other incentive structure the bidder is willing to accept for DR. (This may be as simple as the customer sending a response back to the Bid Receiver that accepts or rejects the initial bid sought, or may involve more complex bid structuring).



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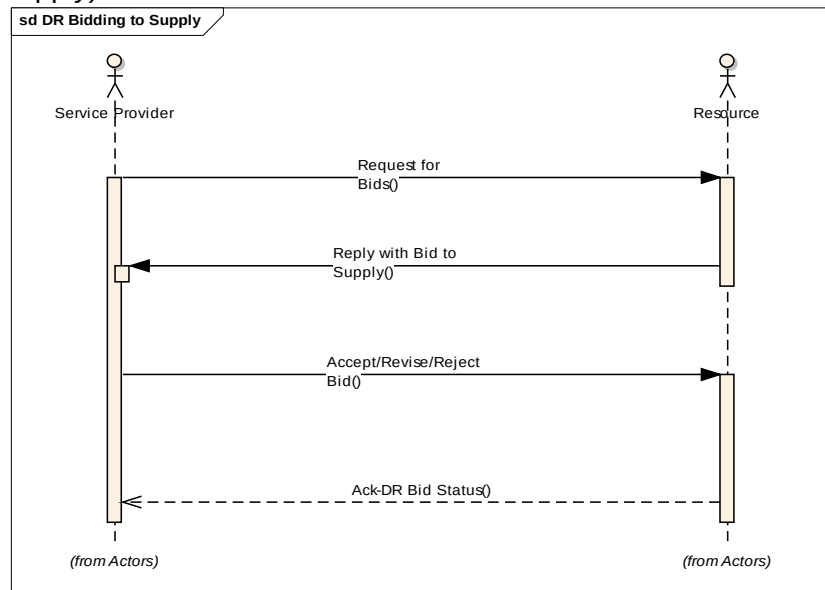
Each offer will have a clearly specified product or service that is being bid and the pricing/incentive structure being offered. The bidder also nominates the amount of and nature of supply being offered, the DR Resource to physically provide the service, and other physical parameters affecting resource availability and capability, in addition to the identity (or ID) of the bidder and resource(s) that comprise the bid.

The Bid Receiver reviews bids (offers) received and clears them, notifying the bidders of the outcome.

The Bidder receives the notification of awards or resource commitments and uses the information internally in preparation for DR Resource Dispatch.

Sequence Diagram

(Note, the Bid in the followign sequence diagram is an offer to supply)





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REQ.17.3.1.4.5.2 DR Bid to Buy

Description

The Bid Receiver opens the forum/venue for receiving a bid. (This may include initiating the bidding process by sending initial information to Bidders indicating parameters of acceptability for bids to be made). The Bidder communicates a bid to buy a specified product/service and the pricing or other incentive structure the bidder is willing to pay to avoid DR. (This may be as simple as the customer sending a response back to the Bid Receiver that accepts or rejects the initial bid sought, or may involve more complex bid structuring).

Each bid will have a clearly specified product or service that is being bid for purchase and the corresponding pricing structure that is acceptable to the Bidder. The Bidder also includes the quantity of product/service in the bid to buy, and specifies any DR Resource(s) that can physically substitute for the product/service in the event the bid to buy is not cleared (i.e., the bidder is unwilling to pay more than the going/market outcome price for the product/service). Other information submitted include physical parameters affecting resource availability and capability, in addition to the identity (or ID) of the bidder and resource(s) that comprise the bid.

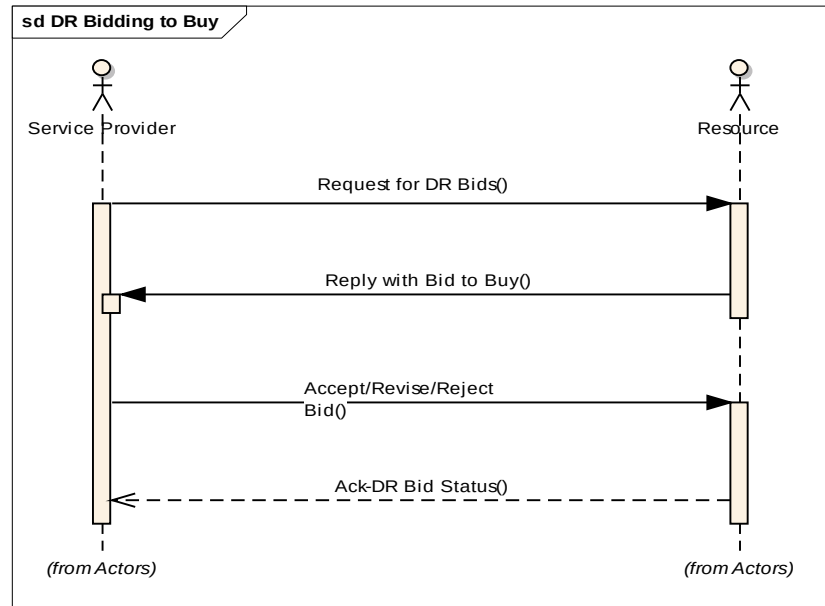
The Bid Receiver reviews bids received and clears all bids, notifying the bidders of the outcome. The Bidder receives the notification of resource commitments and uses the information internally in preparation for DR Resource Dispatch.



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Sequence Diagram





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REQ.17.3.1.4.6 Execute DR Event

The execution of a DR event takes different forms depending on operational situation and the type of DR programs being executed. Typically, they fall into one of the following four use cases, see Figure 5:

1. Advanced DR Notification
2. Broadcast DR Message (price plus information)
3. DR dispatch instruction
4. DR direct load control.

Operational considerations for DR event execution are also associated with DR programs where direct load control or dispatching instructions are carried out.

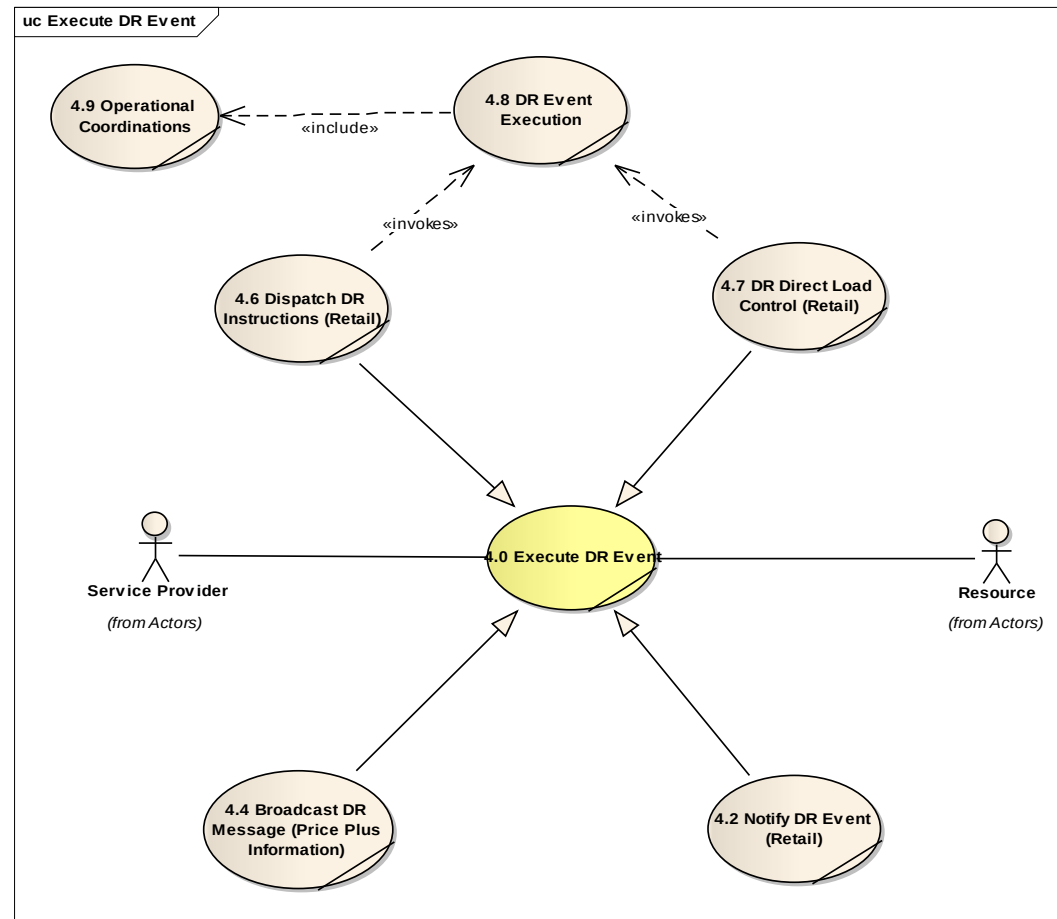


Figure 5. Execute DR Events



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REQ.17.3.1.4.7 Notify DR Event (Retail)

REQ.17.3.1.4.7.1 Advanced Notification for DR (Retail)

Description

This is used by the Service Provider to send the DR Event notification (i.e., DR signal) to the DR Resource.

The Notify DR Event Message applies to one of three types:

Broadcast DR Message (Price Plus Information)

Dispatch DR Instructions for Objectives (Retail)

DR Direct Load Control (Retail).

The message content specific to each of these types is defined in their respective sections below.

Data Requirements

The following are the data requirements that are common to all of the Event Message Types.

<u>Attribute Name</u>	<u>Description</u>
<u>Program ID</u>	<u>Program Identifier</u>
<u>Program Name</u>	<u>Name of the Program</u>
<u>Service Provider ID</u>	<u>Identifier assigned to the Service Provider</u>
<u>Event ID</u>	<u>Identifier assigned to the Event</u>
<u>Event Modification Number</u>	<u>A modification number for the DR event. This is used to indicate if the DR Event has been modified by the Utility. Each time it is modified, this number is incremented.</u>
<u>Area of Event Notice Applicability:</u> <u>The area affected by the Demand Response Event can be defined by a Location attribute (point location or area) or is applicable to a Resource or to an Asset for Direct Load Control.</u>	
<u>Resource ID</u>	<u>Identifier assigned to the Resource</u>
<u>Asset ID</u>	<u>The unique identifier of the asset</u>
<u>Location can be identified by any of the following:</u>	
<u>Service Location ID</u>	<u>Identifier assigned to the Service Location</u>
<u>Address1</u>	<u>Address line 1</u>
<u>Address2</u>	<u>Address line 2</u>
<u>City</u>	<u>City</u>
<u>State/Province</u>	<u>State or Province two-letter code</u>
<u>Zip/Postal</u>	<u>Zip or Postal Code</u>



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<u>Attribute Name</u>	<u>Description</u>
<u>Code</u>	
<u>Country</u>	<u>Country</u>
<u>GPS Coordinates</u>	<u>Latitude and longitude</u>
<u>Weather Station</u>	<u>Weather Station code associated with the Service Location</u>
<u>Zone ID</u>	<u>Identifier assigned to the Zone in which the Service Location is located</u>
<u>Zone</u>	<u>Name of the Zone in which the Service Location is located</u>
<u>Electrical Node ID</u>	<u>Identifier assigned to the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Name</u>	<u>Name of the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Type</u>	<u>Type of Electrical Node at which the Service Location is attached</u>
<u>PNode</u>	<u>Name of the Price Node associated with the Service Location</u>
<u>PNode ID</u>	<u>Identifier assigned to the Price Node associated with the Service Location</u>
<u>The following are other attributes applicable to all DR Event Messages.</u>	
<u>Deployment Type</u>	<u>Type of Deployment.</u> <u>Examples are: Advanced (Normal), Immediate, Audit/Test.</u>
<u>Simple Signal Levels</u>	<u>Used as an alternate and simplified representation of the DR signal, whether it be price based or a dispatch. Takes on a small number of finite levels such as NORMAL, MODERATE, and HIGH, SPECIAL</u>



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Attribute Name	Description																																				
Criticality Level	This field defines the level of criticality of this event. The action taken by load control devices for an event can be solely based on this value, or combination with other Load Control Event fields supported by this device. For example, additional fields such as Average Load Adjustment Percentage, Duty Cycle, Cooling Temperature Offset, Heating Temperature Offset, Cooling Temperature Set Point or Heating Temperature Set Point can be used in combination with the Criticality level. <table><tr><th>Criticality Level</th><th>Level Description</th><th>Participation</th></tr><tr><td>0</td><td>Reserved</td><td></td></tr><tr><td>1</td><td>Green</td><td>Voluntary</td></tr><tr><td>2</td><td>1</td><td>Voluntary</td></tr><tr><td>3</td><td>2</td><td>Voluntary</td></tr><tr><td>4</td><td>3</td><td>Voluntary</td></tr><tr><td>5</td><td>4</td><td>Voluntary</td></tr><tr><td>6</td><td>5</td><td>Voluntary</td></tr><tr><td>7</td><td>Emergency</td><td>Mandatory</td></tr><tr><td>8</td><td>Planned Outage</td><td>Mandatory</td></tr><tr><td>9</td><td>Service Disconnect</td><td>Mandatory</td></tr><tr><td>0x0A to 0x0F</td><td>Utility Defined</td><td>Utility Defined³</td></tr></table>	Criticality Level	Level Description	Participation	0	Reserved		1	Green	Voluntary	2	1	Voluntary	3	2	Voluntary	4	3	Voluntary	5	4	Voluntary	6	5	Voluntary	7	Emergency	Mandatory	8	Planned Outage	Mandatory	9	Service Disconnect	Mandatory	0x0A to 0x0F	Utility Defined	Utility Defined ³
Criticality Level	Level Description	Participation																																			
0	Reserved																																				
1	Green	Voluntary																																			
2	1	Voluntary																																			
3	2	Voluntary																																			
4	3	Voluntary																																			
5	4	Voluntary																																			
6	5	Voluntary																																			
7	Emergency	Mandatory																																			
8	Planned Outage	Mandatory																																			
9	Service Disconnect	Mandatory																																			
0x0A to 0x0F	Utility Defined	Utility Defined ³																																			
Baseline Dates	Dates of days used to calculate the Energy Baseline																																				
Baseline Exclusion Dates	Dates of days Excluded from the calculation of the Energy Baseline																																				
Energy Baseline Value	Calculated Energy Baseline																																				
Energy Baseline Timestamp	Timestamp of Energy Baseline																																				
Deployment Period (Interval): The deployment period that is communicated to a Resource or Asset is an interval contained within the Start or End Time of the Event, but not necessarily for the entire Event.																																					
Event Start Time	Time of Start of deployment period for Event																																				
Event End Time	Time of End of deployment period																																				

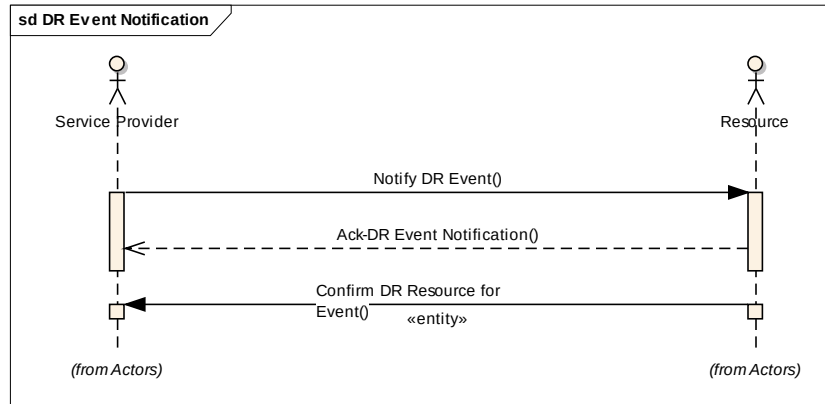
³ Requirement as defined by the ZigBee Smart Energy Profile™ 2.0 Technical Requirements Document



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Sequence Diagram





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REQ.17.3.1.4.7.2 Update a DR Event (Retail)

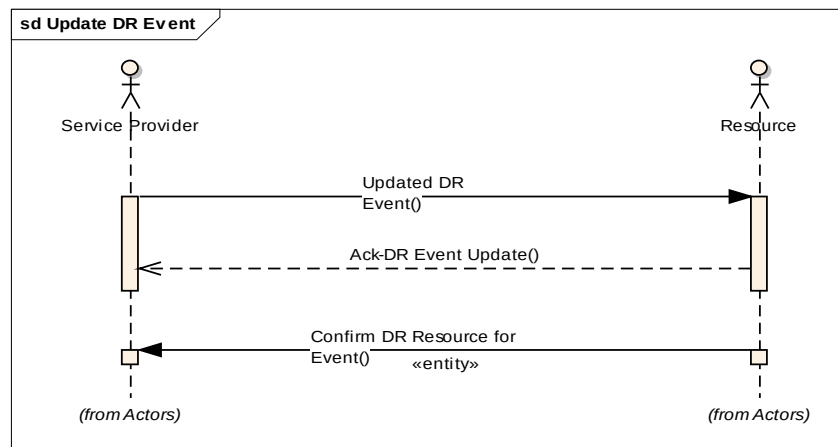
Description

This is used to update a DR event that has been previously notified. The requirements for this use case are the same as those for the "Advanced Notification for DR" use case.

Data Requirements

Attribute Name	Description
<u>Event</u>	<u>See the "Advanced Notification for DR" use case.</u>
<u>Event Modification Number</u>	<u>This is Modification number of the DR event. It is used to indicate that the DR Event has been modified by the Utility or Service Provider. Each time a DR Event is modified, this number is incremented.</u>
<u>Modification reason code</u>	<u>The reason the event was modified.</u>

Sequence Diagram





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REQ.17.3.1.4.7.3 Cancel a DR Event (Retail)

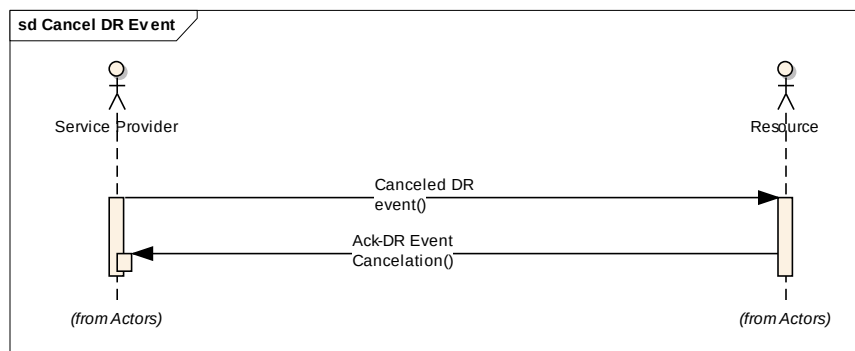
Description

This is used by the Service Provider to notify the DR Resource that a DR Event is being cancelled. It should only be executed if a DR Resource has previously received notification of a DR Event and that event has subsequently been cancelled.

Data Requirements

<u>Attribute Name</u>	<u>Description</u>
<u>Modification reason code</u>	<u>The reason the event is being cancelled.</u>
<u>Event Status</u>	<u>Status of the Event</u>
<u>DR Event Identifier</u>	<u>An identifier for the event that is being cancelled.</u>
<u>Effective date/time</u>	<u>The date and time a cancellation takes effect.</u>

Sequence Diagram





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REQ.17.3.1.4.7.4 DR Resource Confirmation (Retail)

Description

This is a confirmation message that is sent by a DR Resource to the Service Provider as a result of receiving a DR Signal from the Service Provider. It may be used as an acknowledgement of the receipt of the DR signal, but it may also contain various information used to signify how the DR Resource will respond to the DR Signal.

Any changes to the Resource or Asset that may impact participation or performance for the Event (such as Location and Load Profile) shall be provided through the Update Resource or Update Asset Messages.

Data Requirements

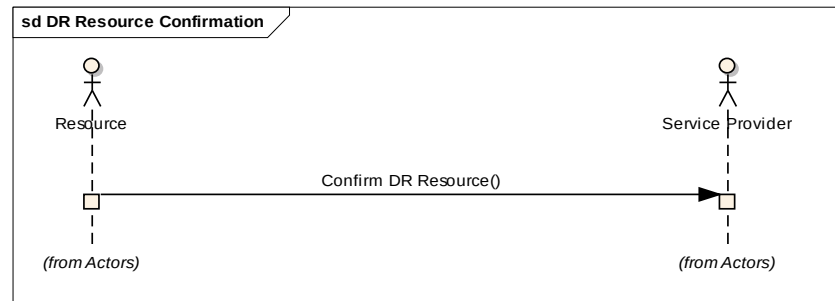
<u>Attribute Name</u>	<u>Description</u>
<u>Resource ID</u>	<u>Identifier assigned to the Resource</u>
<u>Asset ID</u>	<u>The unique identifier of the asset</u>
<u>Exception Conditions</u>	<u>This is used to report that the load controller may not behave as commanded because of a variety of conditions including:</u> <u>Faults in device</u> <u>Customer override.</u>
<u>Load Control State</u>	<u>The state of the load, which includes both commanded states and user settings. This may include a schedule of future states if a particular control algorithm for the load controller is being executed.</u>
<u>Operational Constraints</u>	<u>Operational Constraints at run time may differ from those provided at Enrollment, and will be applicable only to the time interval of the Event for this Resource or Asset.</u>
<u>Constraint Type</u>	<u>Type of operational, schedule or offer constraint</u>
<u>Constraint Interval</u>	<u>The timeframe over which the constraint type applies.</u>
<u>Constraint Value</u>	<u>Value of the Constraint Type and Interval</u>
<u>Offer Dispatch Status</u>	<u>Dispatch Status of Offer</u> <u>a.k.a. as "Opt-in" or "Opt-out" in existing programs.</u>



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Sequence Diagram



REQ.17.3.1.4.8

Broadcast DR Message (Price Plus Information)

Description

Demand Response programs are designed to address different power system concerns caused by the imbalance between generation, transmission and consumption, or environmental concerns. Some DR programs are conducted on a voluntary basis, where the customer can opt to maintain the level or load. Some DR programs are mandatory, where either the customer loads will be curtailed under certain conditions or the customer will incur financial penalties for noncompliance.

In retail market, certain “DR Messages” can be broadcasted to DR resources either directly or through Service Providers. DR Message is defined as information about the DR signals that may affect the demand behaviors of the energy consumers. Obviously, the main component of the DR Message is the pricing information. However, there are other attributes of energy being delivered that may be of interest to energy consumers and could be included in the DR Message.

Based on the OpenADR discussion, the broadcasting function is mainly used for volunteer or non-mission critical DR messages. Therefore, message acknowledgement or confirmation is optional.

DR Source of Power/Generation

“DR Message” also can be source of power or generation. ANSI C12.19-2008 defined the following source of power/generation in Standard Table 12.

Precondition:

The DR Service Provider sends the DR message to service providers. In the case of DR pricing, the DR Service Provider calculates the price



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per location and communicates the appropriate price associated with the DR product to service providers.

Post Condition:

DR Resources received the DR pricing information, and may or may not act based on the DR agreement or contract.

Data Requirements

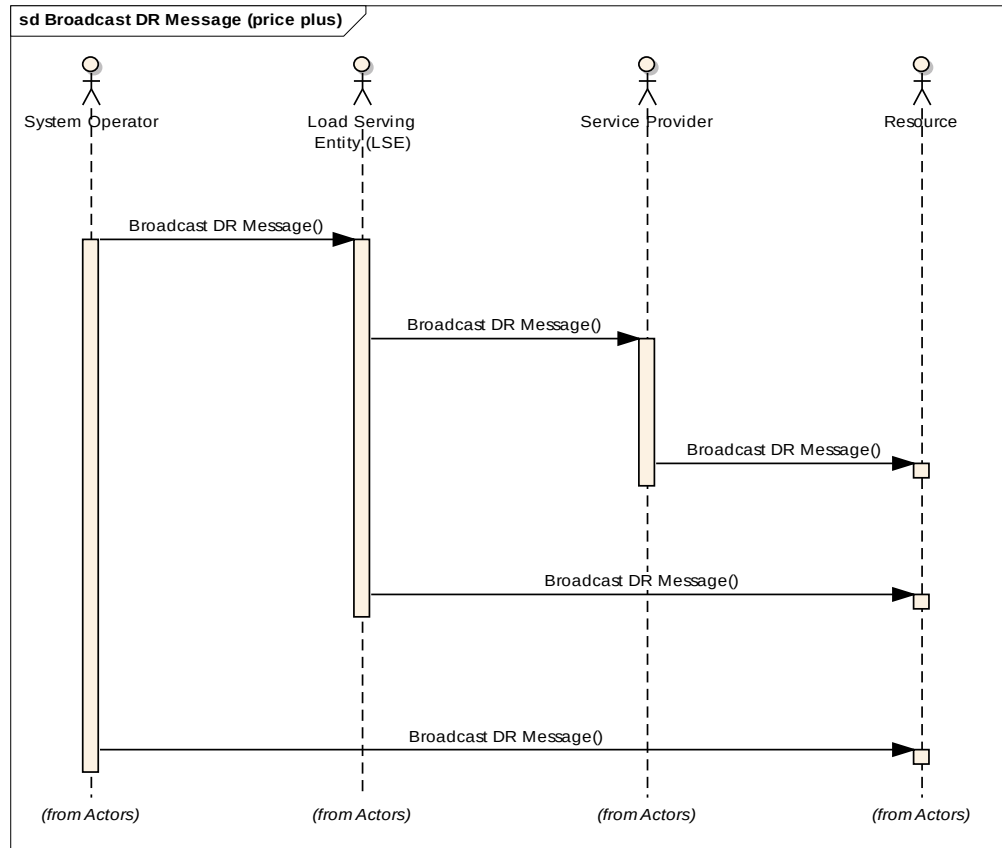
<u>Attribute Name</u>	<u>Description</u>
<u>Currency</u>	<u>Economic unit of exchange in which the total price and price components are stated (e.g. dollars, euros)</u>
<u>Product Price</u>	<u>The sum of all Price Component Values for a given product (Total Price).</u>
<u>Product Price Factor</u>	<u>Terms of use attribute of Product Price Examples: Price absolute, Price relative, Price multiplier</u>
<u>Unit of Measure</u>	<u>Attribute of Product Identifier</u>
<u>Delivery Time</u>	<u>Time at which the product is available for physical consumption</u>
<u>Delivery Interval</u>	<u>The duration over which the product is available for physical consumption</u>
<u>Market Product (Product Type)</u>	<u>Market Product Product types include the following: energy, capacity, regulation, operating reserves (spinning or non-spin).</u>



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Sequence Diagram



REQ.17.3.1.4.9 Dispatch DR Instructions (Retail)

Description

This interaction is used to dispatch DR Resources. This type of interaction is used when the Service Provider needs to achieve specific objectives from the DR Resources during DR events. This means that specific instructions will be given to the DR Resource with objectives (e.g. shed 100 kW) for the load profile of the DR Resource.

Note that for the retail use cases, a Dispatch is considered a special type of DR Notification, and thus, it is very similar in nature to the requirements given for that interaction.



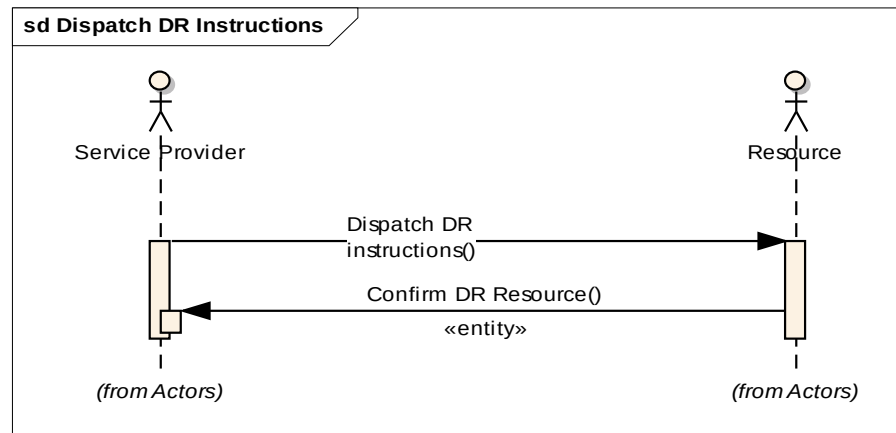
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Data Requirements

Attribute Name	Description
DR Dispatches for DR Objective based messages are of three types. • <u>LOAD LEVEL</u> • <u>LOAD AMOUNT</u> • <u>LOAD PERCENTAGE</u>	
For Load Level: <u>Load Level Value</u>	<u>Value of the load level to be achieved based on a set of enumerated values.</u> <u>(e.g. moderate, high, etc)</u>
For Load Amount: <u>Deployment MW</u>	<u>Deployment quantity expressed as an Absolute</u>
For Load Percentage: <u>Deployment MW</u>	<u>Relative Deployment quantity expressed as %.</u>

Sequence Diagram



REQ.17.3.1.4.10 DR Direct Load Control (Retail)

Description

This use case covers direct interactions between the DR Service Provider and a specific DR Asset for the purposes of putting that asset into a specific load control state (e.g., to turn it on or off). In this case, the DR Asset is a DR Resource with only one DR Asset, and thus, the interaction is directly with the DR Asset.

See REQ.17.3.1.4.11.3, DR Execution - Direct Load Control (DLC) for more details.



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Data Requirements

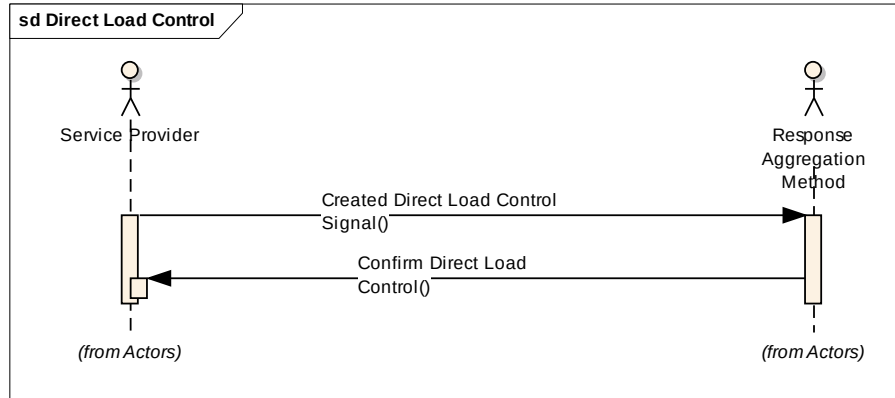
<u>Attribute Name</u>	<u>Description</u>
<u>Asset ID</u>	<u>The unique identifier of the asset</u> <u>(Note: Direct Load Control messages are applicable only to Assets)</u>
<u>Status Check</u>	<u>A signal to require the DR resource status to be sent back.</u> <u>(Only applicable to Direct Load Control)</u>
<u>DR Control Command: Direct Load Control Type</u>	<u>The type of DR Direct Load Control Command: e.g. Set Point, Open/Close, Heating Temperature - offset/setpoint, Cooling Temperature - offset/setpoint, Load adjustment offset</u>
<u>DR Control Command: Direct Load Control Value</u>	<u>Value associated with the Direct Load Control Type.</u>
<u>Event Start Time</u>	<u>Time of Start of deployment period for Event</u>
<u>Event End Time</u>	<u>Time of End of deployment period</u>
<u>Duty Cycle</u>	<u>"Duty Cycle : Defines the maximum On state duty cycle as a percentage of time. Example, if the value is 80, the device would be in an "on state" for 80% of the time for the duration of the event. Range of the value is 0 to 100. A value of 0xFF indicates the field is not used." (from SEP2.0)³</u>
<u>Event Control</u>	<u>Event Control options for randomized start or end times:</u> <u>1= Randomize Start time, 0=Randomized Start not Applied</u> <u>1= Randomize End time, 0=Randomized End not Applied. (from SEP2.0)³</u>
<u>Device Class</u>	<u>Enumeration representing the Device Class to apply the current Load Control Event.³</u>

Sequence Diagram



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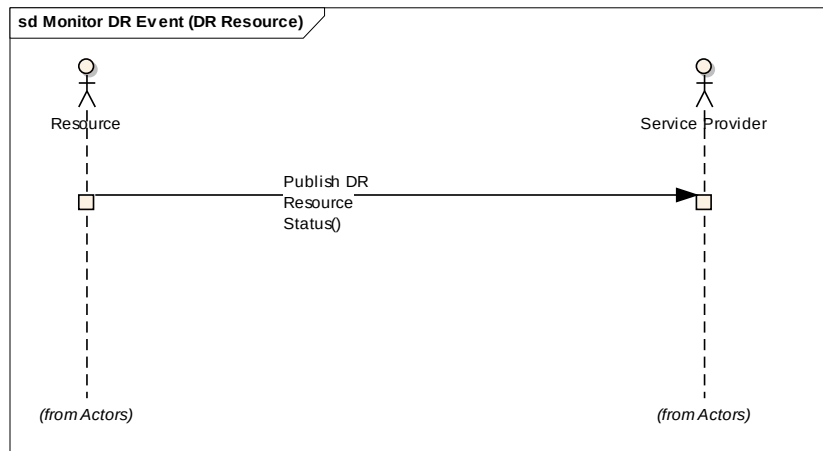
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REQ.17.3.1.4.10.1 Monitor DR Event (DR Resource)

Description

This interaction is used to monitor a DR Resource's behavior. It may be executed as a result of the DR Resource receiving a DR signal or it may be conducted continuously.

Sequence Diagram

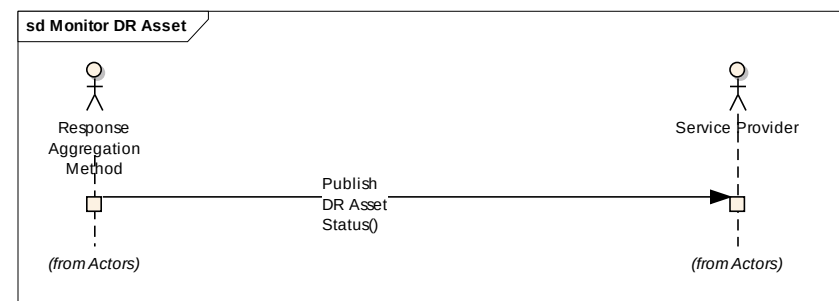


REQ.17.3.1.4.10.2 Monitor DR Event (DR Asset)

Description

This interaction is used to monitor the state of a DR Asset. It may be executed as a result of the DR Asset receiving a DR signal or it may be conducted continuously.

Sequence Diagram





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REQ.17.3.1.4.11 DR Event Execution

Demand Response is deployed for economic or a reliability purposes. At high penetration levels, demand response has to be integrated with the power supply scheduling process, and it may impact the distribution grid operation and reliability, and perhaps the transmission grid operation and reliability. Thus it is important to include the required considerations for the grid and system level operations when developing DR Use Cases and DR signal standards. Such impacts may not be significant at low penetration levels; however, proper considerations must be given to support scalability and expandability for future deployments.

Power system operates based on a real-time balancing of supply and demand. To economically schedule the supply, an accurate load forecast is needed. Traditionally, load forecast was generated using the historical consumption patterns, weather forecast and other similar parameters. With the potential of high-penetration of DR, it will be necessary to incorporate the planned or forecasted DR levels into the load forecast. Also, DR capabilities can be used to support the power system capacity or emergency supply (ancillary service) needs. Such services require proper scheduling and monitoring capabilities.

A demand response event may be initiated by a power system operator in response to a reliability event, e.g., loss of a generating station causing a lack of supply to meet demand, or an uncontrolled set of PEVs overloading of a distribution transformer. A demand response event may also be initiated by utility operational systems based on economic considerations, e.g., reducing or shifting peak load at the system level or at specific feeder or facility. Demand response may also be initiated by a customer in response to a market pricing signal

Considering that the distribution grid in the US is typically a three-phase imbalance circuit, i.e., many customers are on a single-phase or two-phase of the three-phase system. Thus significant changes in customer load patterns could result in undesirable imbalanced conditions on a feeder. Also, load pickup following the termination of a major DR event could possibly cause overloads and other operational problems, if the load pickup is not properly scattered/managed.



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The following provides three representative use cases to highlight some the key interactions. These include:

- Dynamic Price-based DR
- Notification-based DR
- Direct Load Control

REQ.17.3.1.4.11.1 DR Execution – Retail Time Pricing (RTP)

Description

Provide real-time or dynamic pricing (RTP) to retail customers so that customers can vary their demand based on pricing signals. RTP represents retail electricity rates that vary as a function of time

Traditionally, retail tariff has based on a fixed or tiered rate structure with possible considerations of static rates for pre-established time of use (TOU) conditions. Real time or dynamic pricing (RTP) represent retail electricity rate that could vary as a function of time and is intended to modify demand. It requires interval metering for accurate billing based on time-varying prices. A number of states have implemented RTP or other dynamic pricing tariffs for large customers. With a broader deployment of advanced meters, RTP rates may become more common nation-wide.

The scenario presented here represents a case where a location-dependent real-time retail pricing for energy is established based on the Locational Marginal Price (LMP) for that location. LMP values are typically established by an ISO (for regions covered by an ISO/RTO) on a day-ahead (hourly resolution) and real-time basis, typically on a five minute resolution. For the RTP, it may be appropriate to use the real-time LMP as the basis for computing the retail dynamic tariff. However, decisions should be made on the time and the spatial resolution of the RTP. For example, an hourly RTP averaging the five minute pricing values, or a Critical Peak Pricing model to reflect the extreme conditions only, may be adopted. In addition to the energy price, the retail RTP rate may also include the appropriate uplift charges to cover for distribution wire/services charges and for the power loss compensations. Note that the uplift charges are typically subject to a regulatory review and approval.

Special care must be given to the RTP rate design to ensure customer acceptance and adaptation. Also grid operational

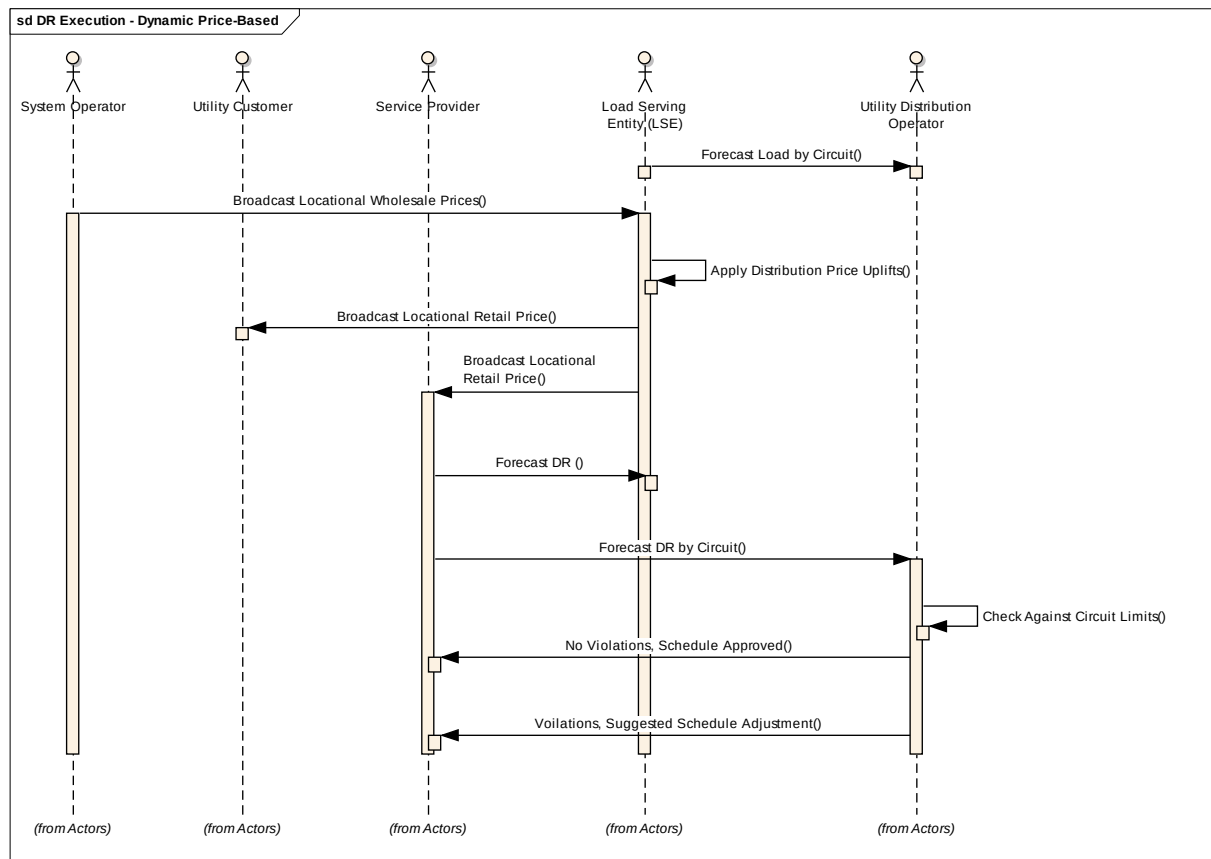


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issues may have to be addressed. For example, during low LMP (RTP) periods (e.g., at night), certain distribution circuits may get over loaded (congested), with customers shifting consumption, e.g., charging PEVs, to that period. This improves the overall system economy, but may cause circuit congestion. To combat this, some have proposed use of demand charges or an additional incentive payment for load reduction, a locational incentive to relief congestion.

Sequence Diagram





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REQ.17.3.1.4.11.2 DR Execution – Notification Based

Description

Notification-based DR is mostly used for economic purposes based on a day-ahead or hours or hour-ahead basis. Notification-based DR may also be used for reliability events when the system operator expects a contingency or operating condition (e.g., congestion or planned outage) on the distribution or the transmission grid that requires a reduction (or an increase) on the load at a given location.

Considering that the business processes for demand response have not yet been standardized across the nations, the following is a representative scenario that captures some of the interactions between the key stakeholders (actors).

At high penetration levels, the DR operation, especially on a day-ahead or hour ahead basis, need to be coordinated with the overall operations and supply scheduling process. As is shown in the Sequence Diagram below, this may require a timely update of the “locational” load forecast and an up-to-date nomination of the DR capabilities. This information may be supplied to the “system” and/or market operator to be incorporated in the overall supply and demand scheduling process. The DR capabilities are specified by the DR Provider to the System Operator based on a DR Program, a price curve, or other nomination protocol. The DR Provider may also inform the Load Serving Entity (LSE) of the locational available DR capabilities.

The notification-based DR dispatch process is typically initiated by the System or Market Operator; the process may also be initiated by an LSE or UDO. It is also possible that the DR Provider be the initiator of the DR process based on a market opportunity (economic operation) or based on a pre-established program.

At high DR penetration levels, it is expected that the DR provider will need to clear the DR schedule with the Distribution Grid Operator, the UDO. This is to insure that the high penetration DR has no adverse impact on the distribution grid reliability and power quality, e.g., cause of excessive imbalances, voltage violation, or an overload during load pickup period. The UDO, in a timely fashion, will inform the DR Provider, if the schedule is cleared or requires an adjustment. Please note that if the DR deployed by a utility company that includes both LSE and UDO functions, such coordination is performed within the company’s operational



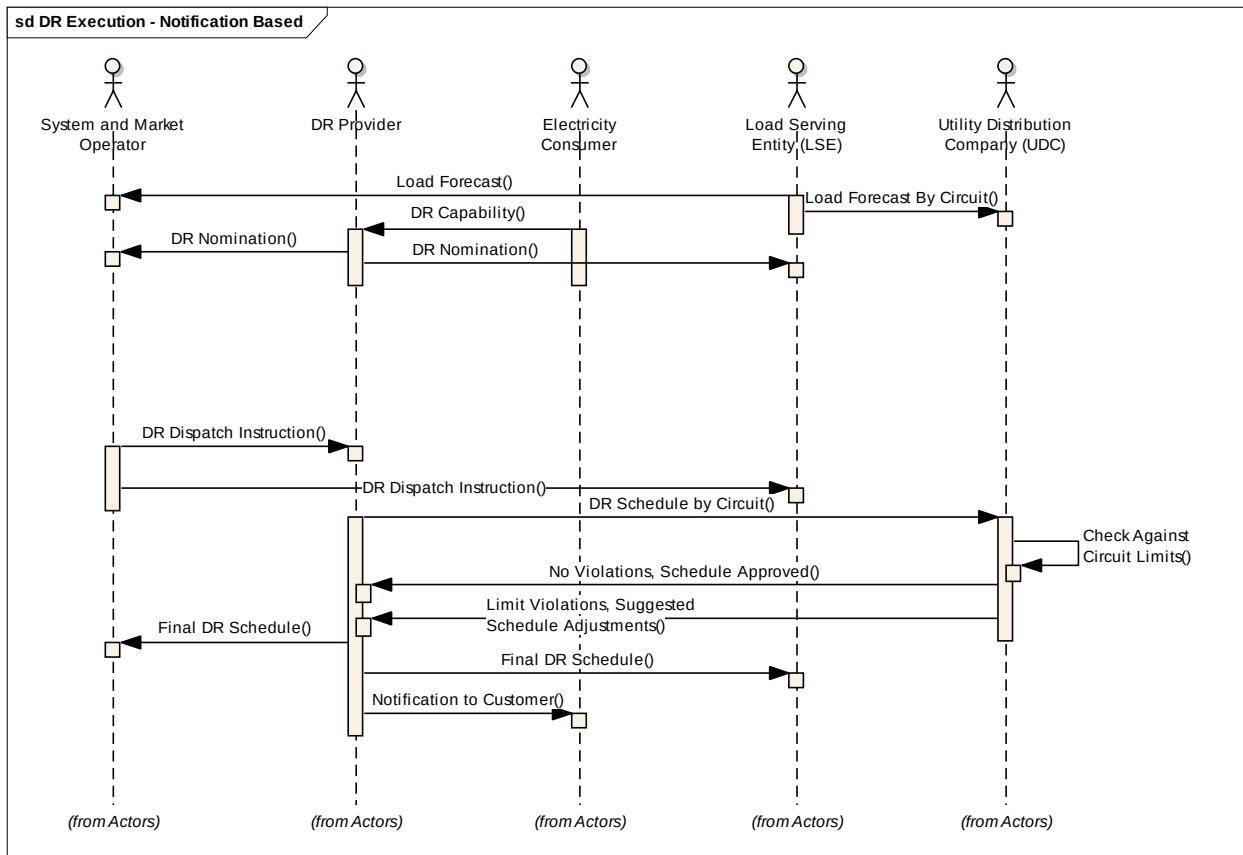
RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
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Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

systems (e.g., DRMS, DMS, etc.), or it can be an integral part of the DR scheduling application.

Following the clearing the DR schedule, notifications are sent to customers for DR operation. Under this scenario, the Market Operator and the LSE are also informed of the final DR schedule.

Sequence Diagram





RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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REQ.17.3.1.4.11.3 DR Execution – Direct Load Control (DLC)

Description

Direct-Load Control is typically used for reliability-based events such as contingency and emergency support, supply of balancing energy or other ancillary service. Many of these programs require quick response time, e.g., five minutes or faster, that is practically only possible through a DLC capability. Direct-Load Control may also be used for economic operations, e.g., water heater programs to reduce or shift peak load.

Considering that the business processes for demand response have not yet been standardized across the nations, the following is a representative DLC scenario that captures the interactions between the key stakeholders (actors).

Direct Load Control is typically called for by a system operator, a transmission or distribution operator. It could be also issued by a Market Operator based on an ancillary service DR award, or by an LSE or DRP for an economic purpose. At high penetration levels, DLC operation needs to be coordinated with the distribution grid operator, the UDO.

As is shown in the sequence diagram below, the customer DR capabilities are aggregated by location and specified/nominated to the Distribution Grid Operator, Load Serving Entity, and/or to the System/Market Operator. In addition to location, the capabilities may also be aggregated by the DR response time, e.g., four seconds, five minutes, 30 minutes, etc.

The DLC Dispatch process is typically initiated by the Transmission or Distribution Operator. The process may also be initiated by the Market Operator or the LSE. The actual control of the DR resources may be done by the DR provider based on the dispatch signal received.

At high DR penetration levels, it is expected that the DLC activation schedule to be coordinated with the Distribution Grid Operator, the UDO. This is to insure that there are no adverse impact on the distribution grid reliability and power quality, e.g., voltage violation, excessive phase imbalances, or an overload during load pickup period. If the DLC deployed by a utility company such coordination can be accomplished within the company's DR and distribution management systems, or performed as an integral part of the DR control functions.

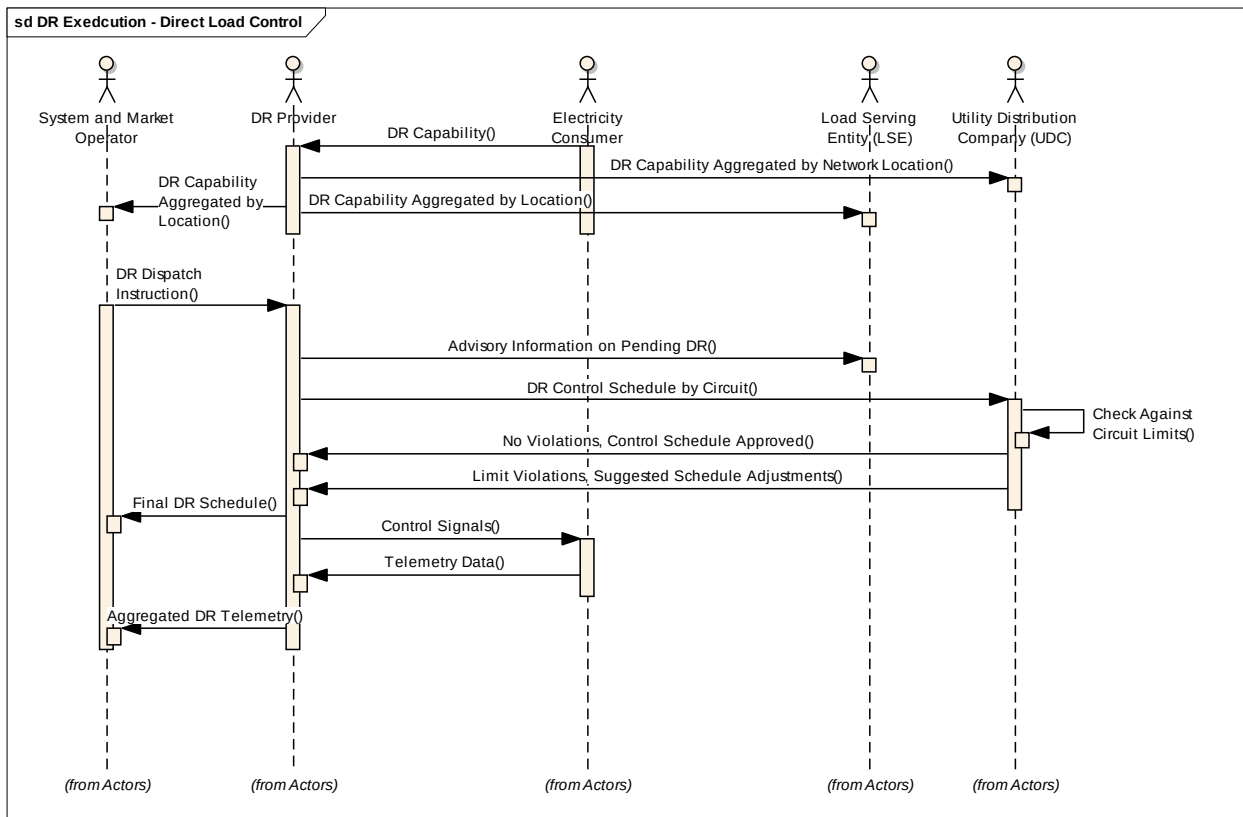


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For a “fast” DR, e.g., provision of ancillary services, a telemetry capability is required to enable the real-time monitoring of the resource condition and its response to the DR control signal.

Sequence Diagram



REQ.17.3.1.4.12 Operational Coordination

Due to the existing differences in the regional retail energy market regulations, wholesale market structure and protocols, and supply and demand conditions, currently there are regional differences in business practices and processes governing demand response. As a result, operational coordination requirements for demand response somewhat vary from region to region, depending on the available retail tariff, retail market structure, available wholesale market for DR and the market mechanics.

The following table summarizes the major roles and responsibilities of the key stakeholders with respect to demand response operation. As can be seen in this table, a significant level of stakeholder coordination is required for an end-to-end DR operation spanning from the wholesale markets to the end-use customers.



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Stake Holder	Key Responsibilities
Wholesale Market Operator	- Establish, administer, and operate wholesale demand response programs and markets; - Determine and publish locational prices for wholesale demand response products; - Improve energy market efficiencies (economics) by integrating demand response products and capabilities; - Monitor compliance to wholesale DR instructions and financially settle with the participating stakeholders.
Transmission Grid / System Operator - Balancing Authority	- Monitor and maintain transmission grid reliability, and call upon wholesale demand-side (demand response) capabilities to address contingency/emergency conditions; - Dispatch demand-side capabilities to balance supply and demand, e.g., mitigating impact of variable generation (e.g., wind). - In regions with no organized wholesale energy market, economically dispatch available generation and demand resources including demand response to optimize supply economics.



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Stake Holder	Key Responsibilities
Distribution Grid Operator – Utility Distribution Company	• Monitor and maintain the distribution grid reliability and the quality of power supply (e.g., voltage levels). Call upon DR to mitigate the distribution contingencies and reliability concerns. • Review and approve the integration of distributed energy resources with the distribution grid. • Assess the operational impact of distributed resources and demand response (DR/DER) on power quality and reliability of the distribution grid, approve high-penetration DR schedules (especially cold-load pickup operation). • Coordinate with the respective Load Serving Entity and Energy Service Providers for the assessment of distribution service and loss compensation charges to retail customers.
Load Serving Entity	• Forecast load and economically schedule supply to meet demand at all times. Incorporate demand response capabilities to improve load factor, reducing/shifting peak load. • Establish and obtain regulatory approval for a fair and unbiased retail tariff for all customer classes. For real-time dynamic pricing (RTP) tariff, apply distribution service, loss compensation and other uplifts to the wholesale locational prices. • Establish and administer demand response and distributed resource management programs including DR tariff. • Meet regional requirements for Renewable Portfolio Standards compliance for power delivery. • Aggregate and schedule DR capabilities in wholesale markets, manage DR programs. • Manage customer metering and billing process.



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Stake Holder	Key Responsibilities
Power Marketer	- Forecast load and economically schedule supply to meet demand at all times. Incorporate demand response capabilities to improve load factor, reducing/shifting peak load. - Establish and obtain regulatory approval for a fair and unbiased retail tariff for all customer classes. For real-time dynamic pricing (RTP) tariff, apply distribution service, loss compensation and other uplifts to the wholesale locational prices. - Operate a wholesale and/or retail demand response programs with wholesale and/or retail customers.
Energy Service Provider	- Operate only in regions with competitive retail market - Be an alternative supplier of electric power to end-use customers by offering competitive products, services and prices. - Forecast aggregated load of the enrolled customers by location as required. - Coordinate the power supply with the respective LSE and UDO. - Support demand response programs (DR/DER) for enrolled customers. - Aggregate demand and demand-side capabilities; schedule the aggregated load and DR capabilities in wholesale markets. - Provide for DR telemetry and other monitoring requirements, on a resource or aggregated basis. - Apply the necessary uplifts (e.g., distribution service and loss compensation charges) to the wholesale locational prices. - Meet regional requirements for Renewable Portfolio Standards compliance for power delivery. - Bill and settle with customers for energy supply and DR operation.



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Stake Holder	Key Responsibilities
Demand Response Provider	• Offer competitive demand response services to the end-use customers. • Design and manage DR programs, establish pricing structure and signals for DR operation • Aggregate demand and demand-side capabilities; and offer/schedule these capabilities with the respective LSE or the wholesale market. • Provide for DR telemetry and other monitoring requirements, on a resource or aggregated basis. • Bill and settle with customers for energy supply and DR operation.
Electricity Customer	• Subscribe to a DR program, and update DR availability and capability information as appropriate • Maintain DR resources, data communications, telemetry, metering and control devices as required. • Respond to pricing signals, DR notifications, or control signals as appropriate.

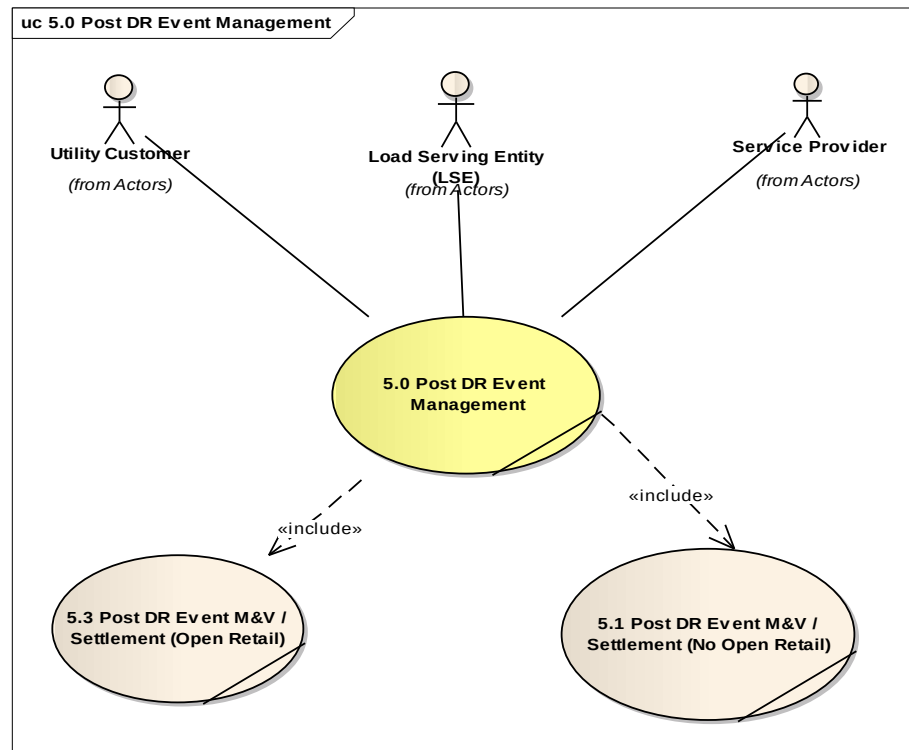


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REQ.17.3.1.4.13 Post DR Event Management

Post DR event management mainly concerns with the reconciliation of the actual consumption of energy within the duration of a DR event with the expected behavior so that proper financial reward or penalties could be carried out. The NAESB M&V standard for DR defines the requirements for most of the post event management. The following use cases describe post DR event management for three different market types.





RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

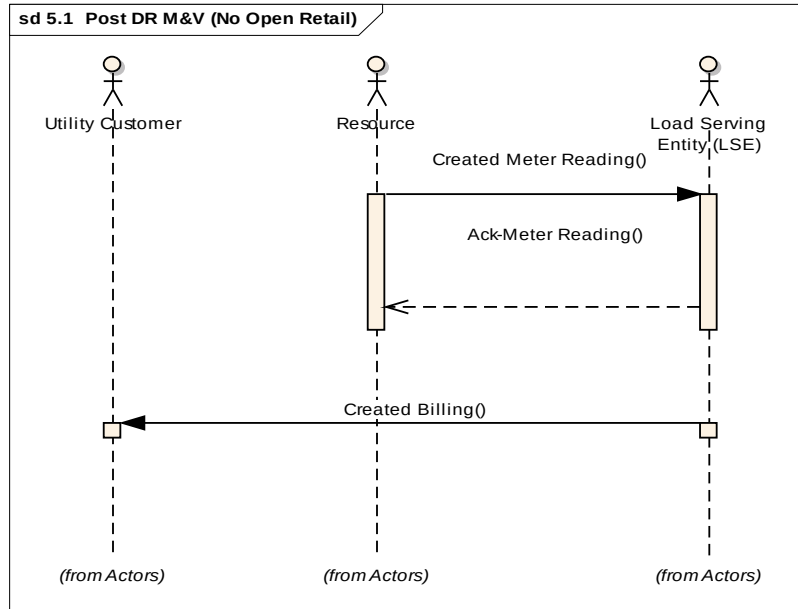
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REQ.17.3.1.4.13.1 Post DR Event M&V / Settlement (No Open Retail)

Description

After DR Event has been completed, then Measurement and Verification (M&V) can confirm whether action has been taken or to measure the impact of the response. After the M&V, then the Financial Settlement is calculated and sent to the Electricity Customer⁴. This Use Case covers the scenarios with no Open Retail Markets.

Sequence Diagram



⁴ In wholesale markets, the settlement for a DR Event is between the System Operator and Market Participant and possibly between the Market Participant and the Electricity Customer.



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

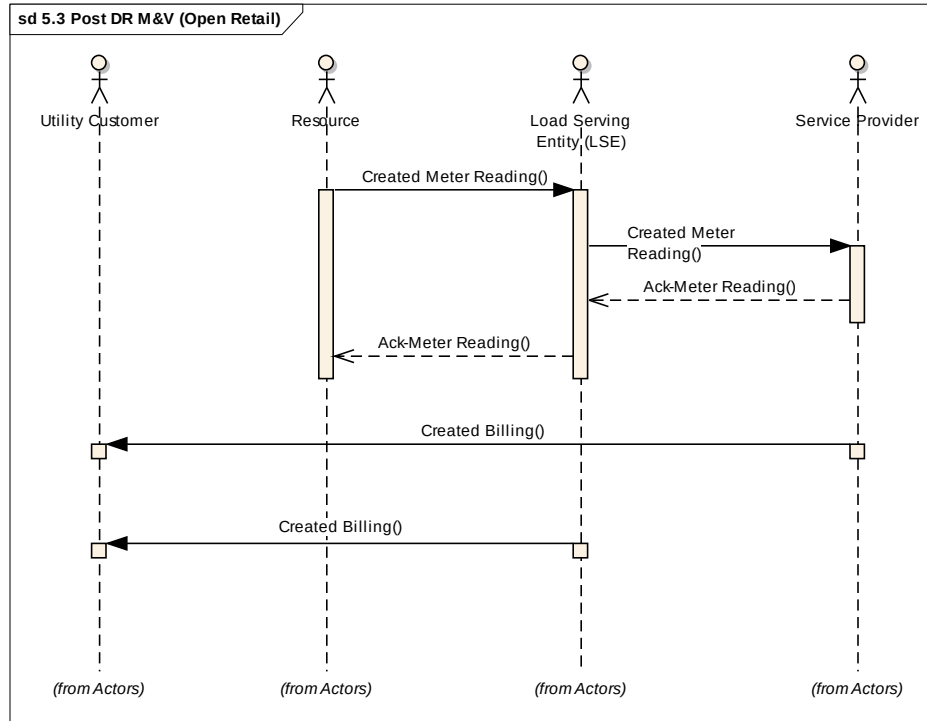
For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.1.4.13.2 Post DR Event M&V / Settlement (Open Retail)

Description

After DR Event has been completed, Measurement and Verification (M&V) can confirm action has been taken or to measure the impact of the response. After the M&V, the Financial Settlement is calculated and sent to the Electricity Customer. This Use Case covers the scenarios with Open Retail Markets.

Sequence Diagram





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REQ.17-A Appendix A – Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall information model for demand response. Figure 1A contains a data model used to illustrate the entity-relationships within the model. Abbreviations/Acronyms correspond to the IDs shown in the figure.

Proper (and Improper) Usage of the Entity-Relationship Model. The entity-relationship model is used to show cardinality among objects in the model, for example every Resource belongs to one and only one Service Provider and a PremiseService Location contains one or more End-DevicesService Delivery Points. The entity-relationship model does not provide use case information; actors are objects in the model and do not “act” in the model. The entity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the enrollment of those Resources may be managed by a System Operators or a Utility Distribution Operator. Both use cases and process maps are separate components of the Model Business Practices.

Reading Crow's Foot Notation. Objects in the model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow's Foot notation, as documents in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a PremiseService Location is related to one-or-more End-DevicesService Delivery Points (reading top to bottom) and every End-DevicesService Delivery Point is related to exactly-one PremiseService Location (reading bottom to top).

~~**Optional Objects.** The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.~~

Optional Objects. The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.

Applicability to Retail and Wholesale. The entity-relationship model is applicable to both wholesale and retail. When using the model for wholesale, the applicable

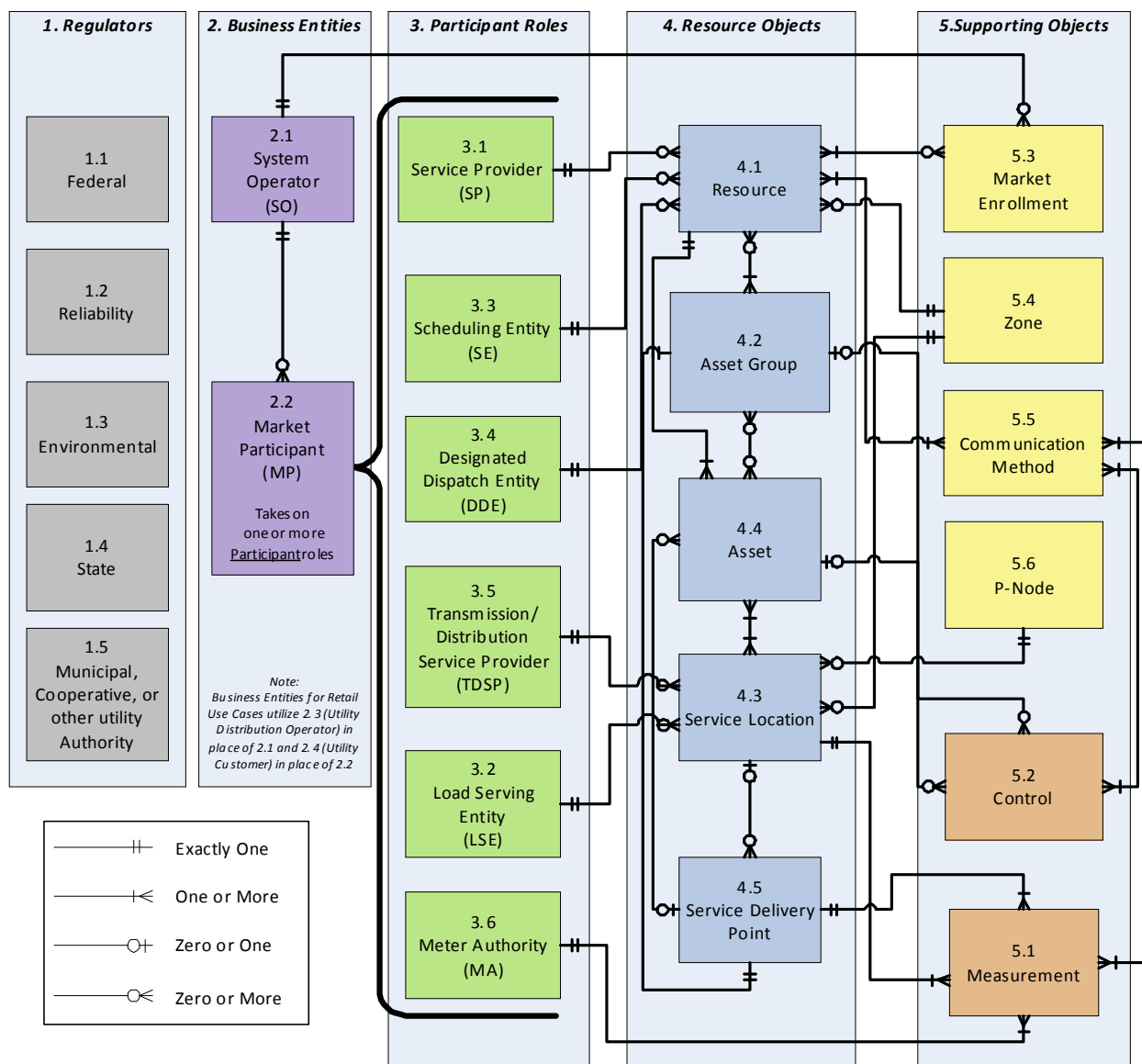


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business entities are 2.1 (System Operator) and 2.3 (Market Participant), while in retail markets, the parallel business entities are 2.3 (Utility Distribution Operator) and 2.4 (Utility Customers). Other than the swapping of the two pairs of terms, the models are identical, including the names of and relationships among objects.

Figure 1A. Entity-Relationship Model for Smart Grid Use Cases





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4. Supporting Documentation

a. Description of Request:

REQ Annual Plan Item 9(c) – “Develop Requirements and Use Cases for PAP 09 – Demand Response/Distributed Energy Resources”

b. Description of Recommendation:

This recommendation provides the data requirements related to the use cases developed as part of the phase one effort

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the development of standard DR and DER signals.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- March 11, 2010 Meeting Notes – To be posted
- March 18, 2010 Meeting Notes – To be posted
- March 25, 2010 Meeting Notes – To be posted
- April 1, 2010 Meeting Notes – To be posted
- April 8, 2010 Meeting Notes – To be posted
- April 29, 2010 Meeting Notes – To be posted
- May 13, 2010 Meeting Notes – To be posted
- May 20, 2010 Meeting Notes – To be posted
- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes – To be posted
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc
- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc



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- September 9, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes – To be posted



Lawrence Berkeley National Laboratory

From: Girish Ghatikar, Demand Response Research Center (DRRC); Lawrence Berkeley National Laboratory (LBNL).

To: Jonathan Booe and North American Energy Standards Board (NAESB).

Ref: NAESB Smart Grid Retail Electricity Quadrant Requirements Comments
November 15, 2010

Dear Jonathan and NAESB Standards Committee:

On behalf of DRRC/LBNL, I request the NAESB committee to create a matrix of traceability of sources and standards covered in the Retail Electric Quadrant (REQ) recommendations, "Requirements Specifications for Retail DR Signals – for NIST PAP 09." This is very important to recognize the contribution coming from different sources. A table in the document for contributions/recommendations from different sources and how these individual contributions/recommendations were included in the document will recognize the work in this important effort by NAESB.

Please note that most of the contributions from UCA related to DR standards for requirements and use cases came from OpenADR 1.0.¹ I appreciate if such sources could be acknowledged accordingly.

Let me know if you've questions and/or need further information.

Sincerely,

Girish Ghatikar
(On behalf of DRRC/LBNL)

¹ Piette, M.A., G. Ghatikar, S. Kiliccote, E. Koch, D. Hennage, P. Palensky, and C. McParland. 2009. Open Automated Demand Response Communications Specification (Version 1.0). California Energy Commission, PIER Program. CEC-500-2009-063 and LBNL-1779E (<http://openadr.lbl.gov/pdf/cec-500-2009-063.pdf>).

BGE Comments



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Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

1. RECOMMENDED ACTION:

☒ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The business process flows, use cases and data requirements presented in this document illustrate the standard interactions between Utility Distribution Company Operator, Service Provider (Demand Response) and Utility Retail Customer for the administration and deployment of dDemand rResponse rResources for retail markets.

RECOMMENDED STANDARDS: (Isn't this redundant??)

In response to NIST's Priority Action Plan 9, this document provides requirements specification, in the form of business process flows, use cases and data requirements in certain areas, to support the standardization of the information exchange between Utility Distribution Company Operator, Service Provider (Demand Response) and Utility Retail Customer. This document shares a standard set of actors and terminologies with the companion Requirements Specification for Wholesale Electric Quadrant Standard DR Demand Response Signals.

BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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(Moved to appropriate location in the document)

REQ.17.2.B

New REQ.17.2.B Defined Terms to be added to REQ.17 are included in the Recommendation Request Titled Phase Two Requirements Specification for Common Electricity Product and Pricing Definition for NIST PAP03 to avoid redundancy between recommendations.

RECOMMENDED STANDARDS:

Specifications for Retail Standard Demand Response Signals

Executive Summary

Specifications for Retail Standard Demand Response Signals

The North America Energy Standards Board (NAESB) Smart Grid Standards Subcommittee took the responsibility of consolidating and developing Demand response (DR) use cases that provide requirements for developing DR control and pricing signal standards, which is called for by National Institute of Standards and Technology (NIST) Priority Action Plans (PAP) 03 and 09. This document addresses the business and data requirements for standardizing control and pricing signals for Retail level Demand Response (DR) and Distributed Energy Resources (DER) as part of the Smart Grid implementation. Wholesale Electric market DR and DER information exchanges are outside the scope of this document and are addressed in the Requirements Specification for Wholesale Electric DR signals. The first step of use case development is the development of the Framework for Integrated DR and DER Models document, which provides an overall business context for DR and DER Models.

According to the Framework Document findings:

1. DR signals standardization must support all four market types; i.e. regions with a) no open wholesale and no retail competition, b) open wholesale market only, c) open retail competition only, d) open wholesale and open retail competition. It must also consider key differences that exist and will continue to exist in all four market types.
2. Wholesale market DR and pricing signals have different characteristics than retail market DR and pricing signals, although commonality in format is feasible.
3. Most Retail Customers (with a few exception of Commercial and Industrial (C&I) Retail Customers) will not interact directly with wholesale market when it comes to DR and pricing signals.
4. Retail pricing models are complex, due to the numerous tariff rate structures that exist in both regulated and un-regulated markets. Attempts to standardize DR control and pricing signals must not hinder regulatory changes or market innovations when it comes to future tariff or pricing models.

BGE Comments



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5. New business ~~e~~Entities (Energy Service Providers (ESP), Demand Response Providers (DRP), Service Providers, and Energy Information Service Providers (ESIP)) as well as new Retail eCustomer energy management systems will play an increasing role in DR implementation.
6. DER may play an increasingly important role in DR, yet the development of tariff and/or pricing models that support DER's role in DR is still in its infancy.
7. The Retail Customer's perspective and ability to react to DR control and pricing signals must be a key driver during the development of DR standards.

The following deals exclusively with the retail level ~~d~~Demand ~~r~~Response signals requirements. The requirements are captured in the form of UML models, where business requirements are captured in Use Case narrative format, data requirements are captured in tabular format, and information exchange flows are captured in sequence diagram format. The top level use cases for retail DR are:

1. Administrate DR Program
2. Administrate Retail Customer for DR
3. Administrate Demand Response Resource
4. Execute Demand Response Event
5. Post Demand Response Event Management

Introduction

Specifications for Retail Standard Demand Response Signals (Redundant)

~~This-These Model Business Practices and the data elements included herein are not intended to replace applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this-these Model Business Practices.~~

Purpose: The purpose of the following Model Business Practices is to capture business and data requirements for Retail Level DR signals between ~~e~~Entities that control and manage the DR programs and ~~e~~Entities that provide ~~d~~Demand ~~r~~Response with Demand Response ~~r~~Resources and assets. This is to fulfill the NAESB SGTF responsibility under the NIST Smart Grid Interoperability Standards development PAP09. This requirements document will then be used by other standards development organizations identified by NIST PAP09 for further development of DR signals technical specifications for ~~both C&I customer and residential all~~ Retail eCustomer markets.

Scope: The scope of these ~~se following~~ Model Business Practices is to provide business and data requirements for standardizing Demand Response signals at the retail (distribution) level.

(Shouldn't these be a definitions???)

Commentary on Distributed Energy Resources: In the context of this ~~report~~document, Distributed Energy Resources (DER) are dispatchable energy generation and storage technologies, typically up to ten MWs in size, that are interconnected to the distribution grid to provide electric capacity and/or energy to a Retail eCustomer or a group of Retail eCustomers

BGE Comments



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and potentially export the excess to the grid for economical purposes. DER systems can generate electric power, as opposed to curtailable or interruptible loads that can just reduce electric loading on the grid.

DER may be subdivided into distributed generation (DG), distributed storage, and plug-in electric vehicles (PEVs):

Distributed generation (DG) technologies can be divided into a) **Renewable Generation**, e.g., small wind power systems, solar photovoltaic (PV), Fuel Cells, Bio-fuel generators and Digesters, and other generation resources using renewable fuel, and b) **Non-Renewable Generation**, e.g., micro-turbines, small combustion turbines, diesel, natural gas and dual-fueled engines, etc.

Storage resources could be divided into a) **Electric Storage**, e.g., battery systems and uninterruptible power supplies (UPS), flywheel, superconducting magnetic energy storage (SMES), etc. and b) **Thermal Storage** – These convert electric power to thermal (cooling/heating) energy for later use, e.g., Ice-based air cooling system, and high-capacity brick-based air heating system.

Plug-in electric and hybrid vehicles (PEV/PHEV) may also be considered as DER. The electric vehicles may be used to supply stored electric energy back to the grid, a.k.a. Vehicle-to-grid (V2G).

Behind-the-meter DER may be bundled with regular load and managed alongside the ~~d~~Demand ~~R~~Response ~~R~~Resources – such as a residential roof-top PV solar panel. But often, DER is treated separately in part due to its control capabilities. In addition to a regular retail tariff, behind-the-meter DER may be subject to net-metering or feed-in tariff, where excess generation can be exported to the grid at an established or a dynamic price.

Similar to Demand Response ~~R~~Resources, DER assets need to be registered and enrolled into a DR program. Furthermore, DER assets are typically required to meet additional technical requirements and certification for grid interconnection. Depending on the size of a DER and its export capabilities, sub-metering and telemetry capabilities may be required to monitor the impact of the DER operation on the distribution grid reliability and power quality. Also, renewable resources may receive Renewable Energy Credits (RECs) and may also qualify as a must-run resource, e.g., wind power in some regions. These need to be incorporated into pricing and control signals associated with DER operation.

(Need to add the boiler-plate language)

The North American Energy Standards Board (NAESB) is a voluntary non-profit organization comprised of members from all aspects of the natural gas and electric industries. Within NAESB, the Retail Electric Quadrant (REQ) and the Retail Gas Quadrant (RGQ) focus on issues impacting the retail sale of energy to Retail Customers. REQ / RGQ Model Business

BGE Comments



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Practices are intended to provide guidance to Distribution Companies, and other Market Participants involved in providing energy service to Retail Customers.

These Model Business Practices are voluntary and do not address policy issues that are the subject of state legislation or regulatory decisions. These Model Business Practices have been adopted with the realization that as the industry evolves, additional and amended Model Business Practices may be necessary. Any industry participant seeking additional or amended Model Business Practices (including principles, definitions, data elements, process descriptions, and technical implementation instructions) should submit a request to the NAESB office, detailing the change, so that the appropriate process may take place to amend the Model Business Practice.

REQ.17.1 Principles

REQ.17.2 Definitions

REQ.17.2.A Business Definitions (Reserved)

REQ.17.2.B Technical Definitions

New REQ.17.2.B Defined Terms to be added to REQ.17 are included in the Recommendation Request Titled Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03 (REQ.15) to avoid redundancy between Model Business Practices.

Note that beginning at REQ.17.3.2 additional terms are defined.

BGE Comments



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REQ.17.3 Model Business Practices

REQ.17.3.1 Genral Practices for Specifications for Retail Standard Demand Response Signals

The following describes general business processes for implementing ~~d~~Demand ~~r~~Response capacities at the retail market level. The following principles apply to the development and application of these business process requirements.

#	Name	Description	Rationale	Implication
1	Scalability	The architecture should allow for the management of millions of <u>Retail</u> Customer premises devices	Scale-out, adding more low-cost machines, has proven to be superior to scale-up, using larger single machines, as a way to handle large loads. For example, high traffic web sites use farms of low-cost machines to serve pages to millions of simultaneous web users.	Architecture should allow the solution to scale-out as more devices are added.
2	Actionable, testable, and transferable work products	Any work (artifacts) that are created can be used by the audience for this work, e.g., <u>utilities</u> <u>Distribution Companies</u> , vendors, regulators, ~~etc~~ or other <u>Market Participants</u> . There needs to be clear, explicit guidance for how to use the artifacts. There is an expectation that the work products are useful at lower levels of design.	Such work products will promote market adoption and minimize the cost and risk of adoption, leverage open and best practices, and establish repeatable processes, patterns, and templates for all work products.	The use of common tools and methods will be fostered. Organizations that do not follow the use of the common tools and methods may have more difficulty implementing the artifacts.

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#	Name	Description	Rationale	Implication
3	Platform Independence, Vendor Neutral	Requirements and design artifacts shall be platform independent. Implementation technology shall be chosen due to its level of acceptance at the marketplace as open standards.	There is an expectation of differentiation and innovation in the marketplace. With greater dependence on a specific platform, there may be less architectural flexibility.	To achieve both technical and semantic interoperability, certain lower level technologies will need to be chosen. For example, Web Services technology is widely used for integration, and UML is widely used for modeling.
4	Cyber Secure	Architecture must incorporate latest secure computing techniques.	The integrity of the electric grid and market depend on preventing unauthorized actors from manipulating the DR and DER system.	Architecture must comply with the latest security guidance from the NIST SGIP Architecture Committee and CyberSecurity Task Group, when it comes to Web Services security related implementation.
5	Interoperability	DR signaling standards should utilize open, interoperable industry standard control and communication technologies to integrate with both common energy management and control systems that can conduct DR activities	Interoperability across different domains of Smart Grid (Not defined) is key to the success of DR signaling standards as it ensures level playing field for innovative solutions for all participants of the Smart Grid .	DR signaling standards must be developed in harmonization with others relevant standards as identified by the NIST SGIP.

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#	Name	Description	Rationale	Implication
6	Automatic Demand Response	The DR program (analysis, notification, event, action, monitoring, verification, settlement) should be automatic. DR signaling standards should provide secure, reliable communications with consumers for DR operations	Automation is the only way to ensure large scale and repeatable ~~d~~ Demand ~~r~~ Response implementation.	Security, reliability and testability must be ensured for DR automation.
7	Cover All Market Types	DR signaling standards should be supported and implementable in all four market types listed in this document	Standards development shall not get in the way of regulatory policy decisions.	DR signals design need to support a wide range of programs and tariff/pricing structures.

REQ.17.3.1.1 Conventions

The use case modeling technique is used for capturing business and data requirements relative to Retail Demand Response. There are two basic diagrams used in this document. The first one is the use case diagram, which shows the scope of business use cases for a given business scenario. The relationships used in the ~~U~~use ~~C~~case diagrams are as follows:

- Include: this indicates additional scenarios
- Extend: this indicates alternatives scenarios
- Generalization (line with triangle head): this indicates variations (sub-types) of the main use case.
- Precedes: this indicates a time sequence
- Invokes: this indicates a pre-condition or dependency

The second is the sequence diagram, which shows the information exchange flows between actors for a given use case. The message flows are shown in one way with the convention of verb and noun, verb indicating the action being taken, noun indicating the name of the information being exchanged. The return message flow is the acknowledgement of the main message flow.

REQ.17.3.1.2 ACTORS

The actors listed in the table below are specific to ~~this~~these Model Business Practices and are a subset of the actors and related objects defined in ~~WEQ-000~~REQ.15. Details on the relationships between the actors and related

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objects are further defined in [Appendix A](#) *(Question whether this should be here or only listed in REQ.15).*

Table 1 - Actor Roles

Term	Actor ID ¹
Communication Method	5.5
Control	5.2
Designated Dispatch Entity	3.4
Designated Dispatch Entity (DDE)	3.4
End Device (ED)	4.5
Enrollment	5.3
Environmental Authority (EA)	1.3
Federal Regulator (FR)	1.1
Load Serving Entity	3.2
Load Serving Entity (LSE)	3.2
Local Authority (LA)	1.5

¹ The Actor ID shown in the table refers to the item number of the corresponding actor or related object in the Entity-Relationship Diagram provided in [Appendix A](#). Definitions of the actors and related objects are included in REQ.1715.2

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Term	Actor ID ¹
Market Participant (MP)	2.2
Measurement	5.1
Metering Authority	3.6
Metering Authority (MA)	3.6
P-Node	5.6
~~Premise~~ Service Location	4.3
Reliability Authority (RA)	1.2
Resource	4.1
Scheduling Entity	3.3
Scheduling Entity (SE)	3.3
Service Provider	3.1
Service Provider (SP)	3.1
State Regulator (SR)	1.4

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Term	Actor ID ¹
System Operator	2.1
Transmission/Distribution Service Provider	3.5
Transmission/Distribution Service Provider (TDSP)	3.5
~~Utility~~ <u>Retail</u> Customer (<u>URC</u>)	2.4
~~Utility~~ Distribution <u>Company</u> Operator (<u>UDCO</u>)	2.3
Zone	5.4

REQ.17.3.1.3 Use Case Overview

Similar to the Wholesale Electric Demand Response use cases, Retail Electric Demand Response use cases generally follow five main steps, see the Figure 1².

1. Administrate DR Program
2. Administrate Retail Customer for DR
3. Administrate Demand Response Resource
4. Execute Demand Response Event
5. Post Demand Response Event Management

There are many programs that exist in today's retail markets with or without open competition. New programs will be defined and deployed in the future. The goal of this use case analysis is to find commonalities among these

² DR program administration related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from the final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the Retail eCustomer eEnrollment and DR program administration related business practices.

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programs so that the derived DR signal messaging specification can be implemented to support a large number of DR programs.

The focus of the Standardized DR Signals is the step 4, Execute DR Event, where the DR signals will be communicated between the DR Providers and the Demand Response Resources. All other use cases are supporting materials to ensure that DR use case requirements are documented and understood in a complete picture.

The use cases included in this document are not intended to be required or exhaustive and are provided for clarification purposes.

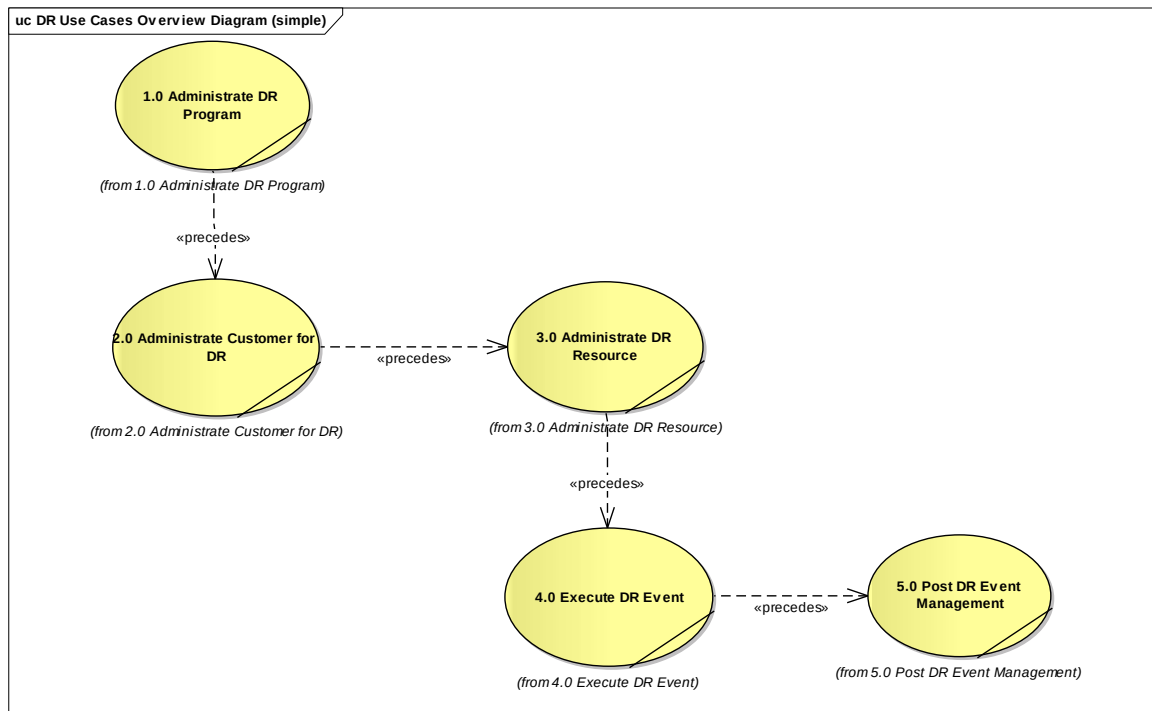


Figure 1. Retail Market DR Use Case Overview

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REQ.17.3.1.42 Specific Use Cases (Note: the following terms are defined herein and are in addition to those listed as Technical definitions in REQ.17.2.B)

REQ.17.3.1.42.1 Administrate DR Program

DR program administration related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from these se final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the Retail eCustomer eEnrollment and DR program administration related business practices.

REQ.17.3.1.42.2 Administrate Customer for DR

DR program Retail eCustomer eEnrollment related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from these se final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the Retail eCustomer eEnrollment and DR program administration related business practices.

REQ.17.3.1.42.3 Administrate DR Resource

DR Resource is an equivalent of Resource defined in the actor list table.

As part of eEnrolling Retail eCustomers to in a DR program, specific Demand Response #Resources and assets that are associated with Retail eCustomers' accounts and premises will also need to be registered. Figure 4 shows the actors and use cases involved in administrating Demand Response #Resources and/or assets into DR programs. The following use cases deal with the registration, update, and removal of Demand Response #Resources and assets associated with a Retail eCustomer. When updating Demand Response #Resources, there will also be potential use cases of DR bidding process, either for supplying or for buying power. There are also cases where Distributed Energy Resources will act as DR assets.

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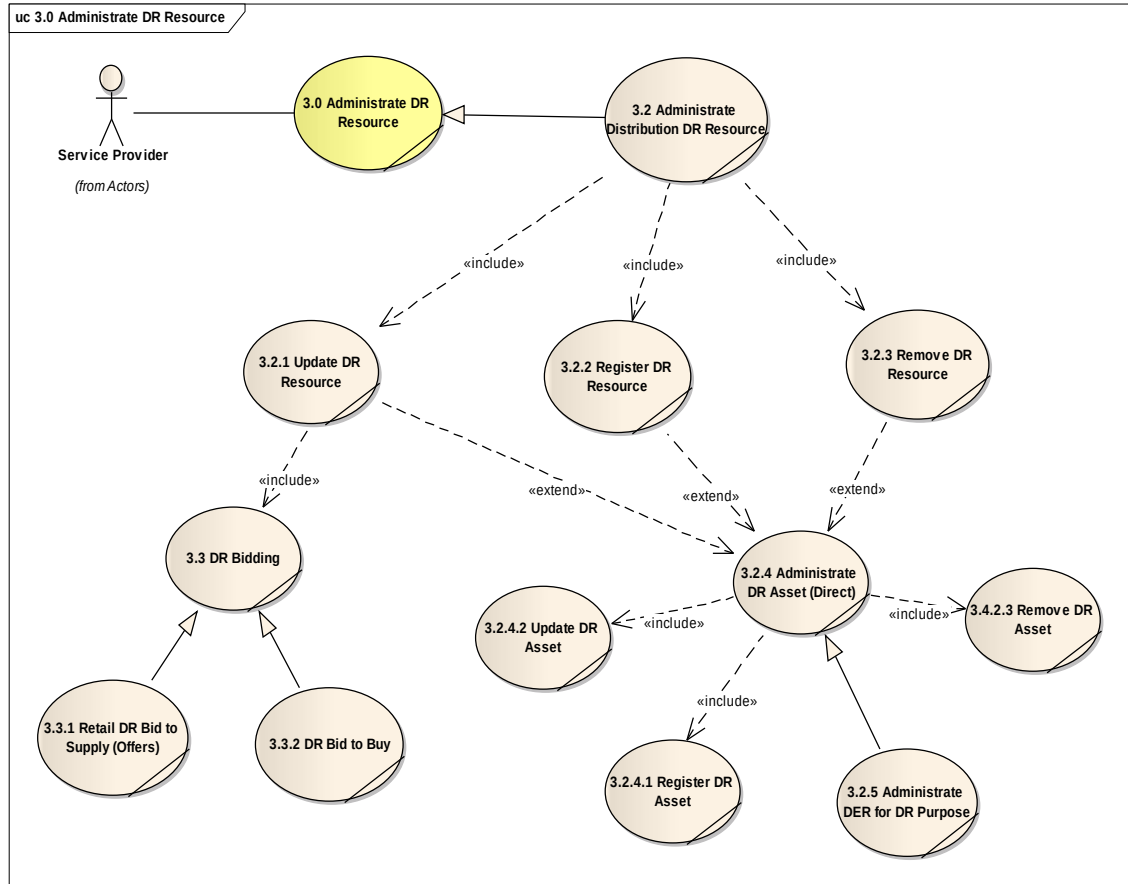


Figure 2. Administrate DR Resources and/or Assets into DR Programs

REQ.17.3.1.42.3.1 Administrate Distribution DR Resource

These activities are used to administer all of the DR Resources and Assets, including a variety of activities surrounding the registration of DR Resources and the management of information surrounding the DR Resources that a Service Provider may call upon during a DR eEvent. Before a DR Resource may be called upon, it must be registered with the Service Provider. The administration of a DR Resource covers the following requirements:

- The need of the Service Provider to identify a DR Resource for communications purposes;
- The need of the Service Provider to establish DR Resource accounts for accounting purposes;
- The need of the Service Provider to collect information from DR Resources prior to DR eEvents for the purposes of determining which DR Resources to call upon during a DR

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Event; and

- The need of the Service Provider to collect information from DR Resources prior to DR eEvents for the purposes of determining the nature of the DR signals to send to the DR Resources.

REQ.17.3.1.42.3.2 Update DR Resource

REQ.17.3.2.3.2.1 Description

When the base capacity of a DR Resource changes from when it was last registered with the DR provider, Retail eCustomer needs to provide updated information to the DR provider so that such information can be factored into the consideration for DR eEvent planning.

REQ.17.3.2.3.2.2 Data Requirements

<u>Attribute Name</u>	<u>Description</u>
<u>Resource ID</u>	<u>Identifier assigned to the Resource</u>
<u>Resource Type</u>	<u>Type of Resource. Examples are: !Load reduction (curtailable or interruptible load), generation, combination, DG, renewable, and storage.</u>
<u>Transmission/Distribution Service Provider Account Number</u>	<u>Transmission/Distribution Service Provider's (Utility Distribution Company) account number for the Resource.</u>
<u>Demand Response Provider</u>	<u>The eEntity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response products.</u>
<u>DR Resource Group ID</u>	<u>Grouping of Resources that can respond to the same DR Signal.</u>
<u>Program Identifier</u>	<u>The identifier of the program</u>
<u>Constraint Type</u>	<u>Type of operational, schedule or offer constraint</u>
<u>Constraint Interval</u>	<u>The timeframe over which the constraint type applies.</u>
<u>Constraint Value</u>	<u>Value of the Constraint Type and Interval</u>
<u>Effective Enrollment Date</u>	<u>Effective Start Date for the Enrollment (This is a defined term. The correct definition should be used)</u>

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<u>Attribute Name</u>	<u>Description</u>
<u>Location</u>	The location of a Resource defined by one or more of the following attributes:
<u>Location Attributes</u>	
<u>Service Location ID</u>	Identifier assigned to the Service Location
<u>Address1</u>	Address line 1
<u>Address2</u>	Address line 2
<u>City</u>	City
<u>State/Province</u>	State or Province two-letter code
<u>Zip/Postal Code</u>	Zip or Postal Code
<u>Country</u>	Country
<u>GPS Coordinates</u>	Latitude and longitude
<u>Weather Station</u>	Weather Station code associated with the Service Location
<u>Zone ID</u>	Identifier assigned to the Zone in which the Service Location is located
<u>Zone</u>	Name of the Zone in which the Service Location is located
<u>Electrical Node ID</u>	Identifier assigned to the Electrical Node at which the Service Location is connected
<u>Electrical Node Name</u>	Name of the Electrical Node at which the Service Location is connected
<u>Electrical Node Type</u>	Type of Electrical Node at which the Service Location is attached
<u>PNode</u>	Name of the Price Node associated with the Service Location
<u>PNode ID</u>	Identifier assigned to the Price Node associated with the Service Location
<u>End of Location Attributes</u>	
<u>Response Time</u>	The amount of time before an asset/Resource is capable of meeting its full performance, in response to a request by a Service Provider to shed load.
<u>Capacity Type</u>	Type of Capacity
<u>Capacity Type description</u>	Description of the Type of Capacity
<u>Nominal Capacity</u>	Nominated load

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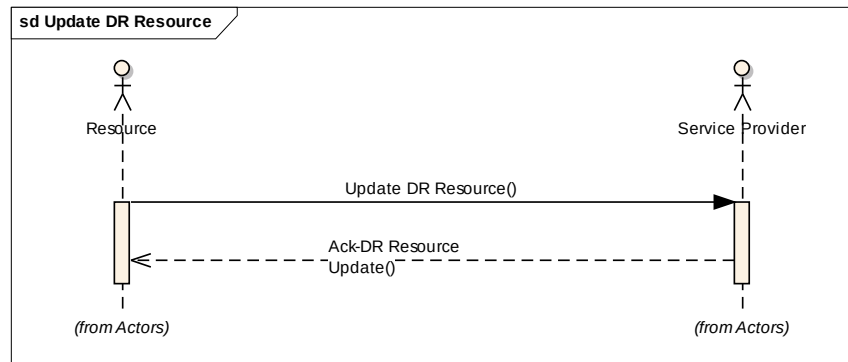


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Attribute Name	Description
<u>Offer Commit Status.</u>	<u>Commitment status of offer</u> <u>Product-specific commitment</u> <u>status types included with offer.</u> <u>Examples include: economic,</u> <u>emergency, must-run, not</u> <u>participating, outage run status,</u> <u>override status, etc.</u> <u>Also referred to as "opt-in" or</u> <u>"opt-out" for existing Demand</u> <u>Response Programs.</u>
<u>Resource Type</u>	<u>Type of Resource</u> <u>Examples are: load reduction</u> <u>(curtailable or interruptible load),</u> <u>generation, combination, DG,</u> <u>renewable, storage, etc.</u>
<u>Resource Qualification Test</u> <u>Date</u>	<u>Date the Resource demonstrated</u> <u>its ability to deliver a product or</u> <u>service</u>
<u>Requalification Test Date</u>	<u>Date the Resource will retest its</u> <u>ability to deliver a product or</u> <u>service</u>
<u>Enrollment End Date</u>	<u>Date of Termination of</u> <u>Enrollment</u> <u>(There is a defined</u> <u>term – Drop Effective Date –</u> <u>which covers this)</u>
<u>Enrollment Status</u>	<u>Status of the Enrollment for the</u> <u>Resource</u>

Sequence Diagram



REQ.17.3.1.42.3.3 Register DR Resource

REQ.17.3.2.3.3.1 Description

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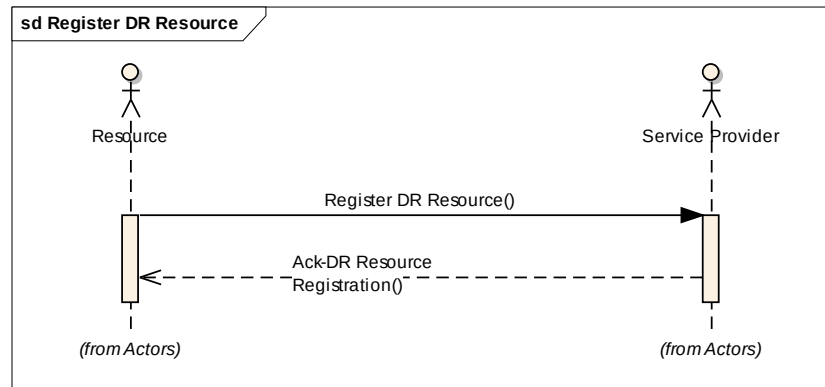
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A party with ownership, controlling interest, or administrative responsibilities for a DR Asset or DR Resource that communicates status-related operational information about the DR Asset or DR Resource to a Service Provider. For example, the owner of a DR Resource or Asset may wish to declare their inability to shed load (an outage) due to summer shutdown or may wish to reduce the available capacity of a resource/asset due to equipment maintenance or other causes.

REQ.17.3.2.3.3.2 Data Requirements

The Data Requirements are the same for Register / Enroll DR Resource and Update DR Resource.

Sequence Diagram



REQ.17.3.1.42.3.4 Remove DR Resource

REQ.17.3.2.3.4.1 Description

When a DR resource is no longer available permanently for DR purpose, it needs to be removed from the DR program for that customer so that it will be accounted for DR eEvent planning.

REQ.17.3.2.3.4.2 Data Requirements

Attribute Name	Description
<u>Resource ID</u>	<u>Identifier assigned to the Resource that is removed.</u>
<u>Program Identifier</u>	<u>The identifier of the program</u>
<u>Enrollment End Date</u>	<u>Date of Termination of Enrollment Should use Drop Effective Date</u>
<u>Enrollment Status</u>	<u>Status of the Enrollment for the Resource (Set to 'REMOVE')</u>

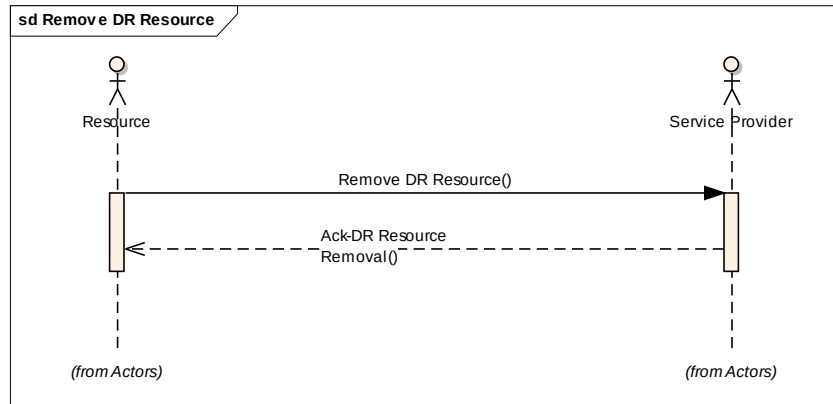
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Sequence Diagram



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REQ.17.3.1.42.4 Administrate DR Asset (Direct)

REQ.17.3.1.42.4.1 Register DR Asset

REQ.17.3.2.4.1.1 Description

The DR AAsset registration process must capture key identifiers to enable accurate tracking of DR assets and their capabilities. A requirement for a System and Market Operator, Load Serving Entity, Service Provider, or other eEntity facilitating the registration process (hereinafter referred to as DR Asset Administrator (Defined ??)) is to track assets. This is done through DR asset registration and association of physical DR assets to DR Resources to recognize the asset and its potential contribution as part of a DR Resource. The DR Asset Administrator ultimately administers the DR AAsset registration process to recognize DR AAssets that can serve as part of a DR Resource, although the Retail Customer may be party to the registration process.

REQ.17.3.2.4.1.2 Data Requirements

<u>Attribute Name</u>	<u>Description</u>
<u>Asset ID</u>	<u>The unique identifier of the asset</u>
<u>Program Identifier</u>	<u>The identifier of the program</u>
<u>DR Asset Group ID</u>	<u>Grouping of <u>AAssets</u> that can respond to the same DR Signal within a DR Resource. (See DR Resource Specification)</u>
<u>Asset Operator ID</u>	<u>The identifier of the business <u>eEntity</u> that operates the DR assets. This is the <u>eEntity</u> that has physical control of the asset and control of the capability to participate in DR Events.</u>
<u>Asset Operator Name</u>	<u>The name of the business <u>eEntity</u> that operates the DR assets. This is the <u>eEntity</u> that has physical control of the asset and control of the capability to participate in DR Events.</u>
<u>Asset Owner ID</u>	<u>The Identifier of the business <u>eEntity</u> that owns the DR assets (<u>eEntity</u> that has the right to use or transfer use of the asset).</u>
<u>Asset Owner Name</u>	<u>The Name of business <u>eEntity</u> that owns the DR assets (<u>eEntity</u> that has the right to use or transfer use of the asset).</u>
<u>Location</u>	<u>The location of a Resource defined by one or more attributes:</u>
<u>Service Location ID</u>	<u>Identifier assigned to the Service Location</u>

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<u>Attribute Name</u>	<u>Description</u>
<u>Address1</u>	<u>Address line 1</u>
<u>Address2</u>	<u>Address line 2</u>
<u>City</u>	<u>City</u>
<u>State/Province</u>	<u>State or Province two-letter code</u>
<u>Zip/Postal Code</u>	<u>Zip or Postal Code</u>
<u>Country</u>	<u>Country</u>
<u>GPS Coordinates</u>	<u>Latitude and longitude</u>
<u>Weather Station</u>	<u>Weather Station code associated with the Service Location</u>
<u>Zone ID</u>	<u>Identifier assigned to the Zone in which the Service Location is located</u>
<u>Zone</u>	<u>Name of the Zone in which the Service Location is located</u>
<u>Electrical Node ID</u>	<u>Identifier assigned to the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Name</u>	<u>Name of the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Type</u>	<u>Type of Electrical Node at which the Service Location is attached</u>
<u>PNode</u>	<u>Name of the Price Node associated with the Service Location</u>
<u>PNode ID</u>	<u>Identifier assigned to the Price Node associated with the Service Location</u>
<u>Effective Enrollment Date</u>	<u>Effective Start Date for the Enrollment (Registration) <i>(Existing definition should be used – Enrollment Effective Date)</i></u>
<u>Enrollment Status</u>	<u>Status of the Enrollment for the Asset</u>
<u>Offer Commit Status</u>	<u>Commitment status of offer</u> <u>Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc.</u> <u>Also referred to as "opt-in" or "opt-out" for existing Demand Response Programs.</u>
<u>DR Asset Physical Capabilities</u>	<u>Asset Capabilities include Ramp Rates and Capacity.</u>
<u>Ramp Rate Value</u>	<u>Ramp Rate associated with the selected Ramp Rate tType for the selected Ramp Rate sSegment and Ramp Rate dDirection</u>

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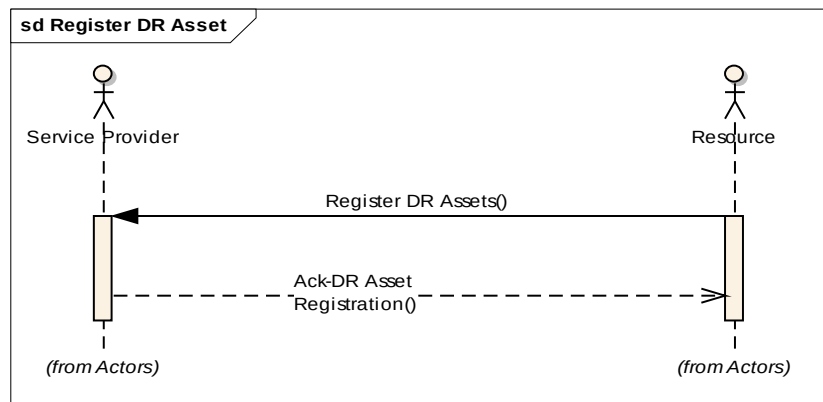


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<u>Attribute Name</u>	<u>Description</u>
<u>Capacity Type</u>	<u>Type of Capacity</u>
<u>Capacity Type description</u>	<u>Description of the tType of cCapacity</u>
<u>Nominal Capacity</u>	<u>Nominated LLoad</u>
<u>Asset Manufacturer</u>	<u>Manufacturer of the AAsset</u>
<u>Asset Model</u>	<u>Model identifier of the AAsset assigned by the Mmanufacturer</u>
<u>Asset Version</u>	<u>Model version identifier assigned by the Mmanufacturer.</u>
<u>Asset Manufacture Date</u>	<u>Date of Mmanufacture of the AAsset</u>
<u>Asset Type</u>	<u>Type of AAsset.</u> <u>Examples are: LLoad reduction (curtailable or interruptible LLoad), generation, combination, DG, renewable, storage, etc.</u>
<u>DR Resources</u>	<u>The identifier of DR rResources that the DR AAssets belong to. An AAsset can associate with multiple Resources, but with only one Resource for a DR Pprogram.</u>

Sequence Diagram



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REQ.17.3.1.42.4.2 Update DR Asset

REQ.17.3.2.4.2.1 Description

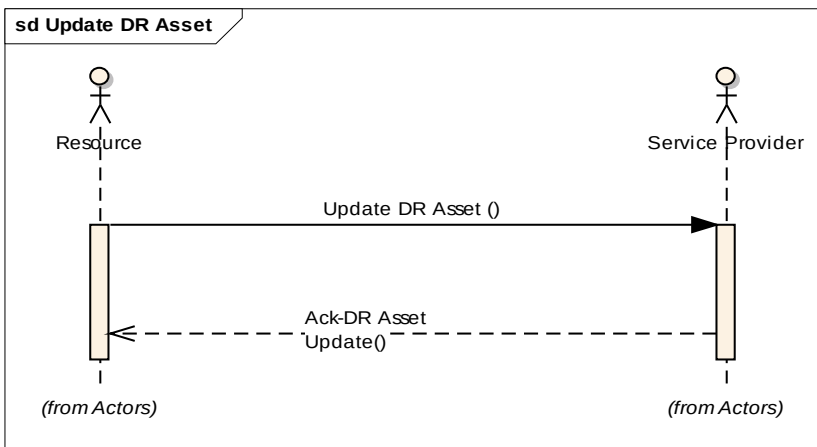
Once a DR aAsset registration is completed, changes to elements of the registration may be required or desired. After identifying the specific required modification and verifying the authorization to perform the update, each of the considerations identified in the DR AAsset registration step should be evaluated and utilized, where necessary, during the update of the DR AAsset information. The ability to update DR AAsset information helps to ensure the asset information on record is current and complete.

Parties that are privy to and rely on the update should be notified of updates as soon as practicable after they are made. Additionally, these parties should have access to review and, in some cases, to approve/disapprove the update(s).

REQ.17.3.2.4.2.2 Data Requirements

The Data Requirements are the same for Register / Enroll DR AAsset and Update DR AAsset.

Sequence Diagram



BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.1.4.4.3 Remove DR Asset

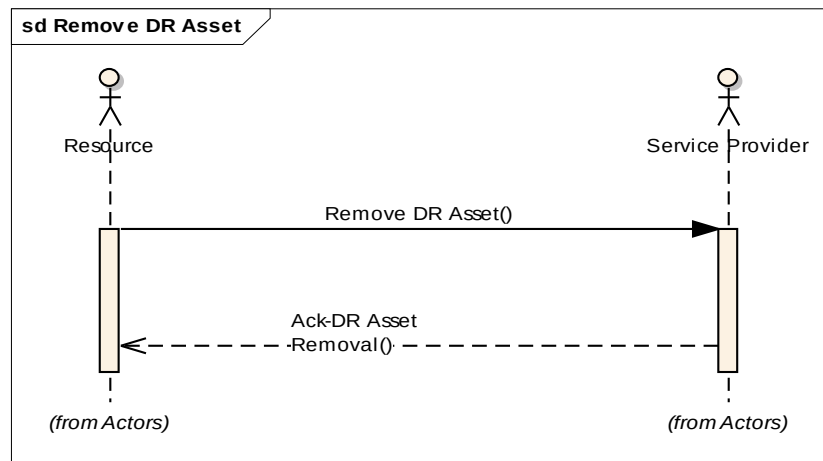
Description

Removing a DR Asset must take into account any DR Resource long term commitments in System—OperatorProgram Administrator programs and contractual obligations with Service Providers or Load Serving Entities. In addition, ~~a~~Applicable ~~r~~Regulatory ~~agency—Authority~~ filings and approvals must be considered prior to removing a DR Asset from a DR program.

Data Requirements

<u>Attribute Name</u>	<u>Description</u>
<u>Asset ID</u>	<u>The unique identifier of the asset</u>
<u>Program Identifier</u>	<u>The identifier of the program</u>
<u>Enrollment End Date</u>	<u>Date of Termination of Enrollment (<i>Should use Drop Effective Date</i>)</u>
<u>Enrollment Status</u>	<u>Status of the Enrollment for the Asset ('REMOVE')</u>

Sequence Diagram



BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.1.42.5 DR Bidding

Description

Demand Response Bidding occurs after the DR Assets and Resources that are to comprise the desired bid have been registered and a bid or an offer is to be formed. The DR Bidding use case has two sub-use cases, depending on the type of bid to be developed for submission: a bid to supply (i.e., an offer), or a bid to buy. The eEntity operating the DR bBidding program (the Bid Receiver) receives bids from participants (the Bidders). The Bidder may be a Retail Customer bidding with either an energy retailer (e.g., LSE, ESP), a Service Provider (e.g., CSP, DRP), or a power marketer (i.e., wholesale market participant). The Bidder may also be a Service Provider bidding up to a LSE or power marketer.

Before the start of the bidding process, it is assumed that DR Resources available for selection are already registered to provide the physical resource participating in the DR Bidding program. It is also assumed that the bBidder has already registered to bid with the bBid Receiver and has been informed on the appropriate timing and parameters for bid participation. The DR bBidding process starts with the decision of the Bidder to develop a bid for submission. The Bidder submits its bid to the Bid Receiver within the appropriate time window and following set guidelines for bidding. The Bidder receives information on the outcome of the submitted bid from the Bid Receiver, who notifies of the bid outcome (e.g., a resource award or other DR commitment).

Examples of retail DR Bidding programs include:

- Demand Bidding
- Capacity Bidding

REQ.17.3.1.42.5.1 DR Bid to Supply (Retail Offers)

REQ.17.3.2.5.1.1 Description

The Bid Receiver opens the forum/venue for receiving an offer. (This may include initiating the bidding process by sending initial information to Bidders indicating parameters of acceptability for bids to be made). The Bidder communicates an offer to supply a specified product/service and the pricing or other incentive structure the bidder is willing to accept for DR. (This may be as simple as the Retail eCustomer sending a response back to the Bid Receiver that accepts or rejects the initial bid sought, or may involve more complex bid structuring).

BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
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Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

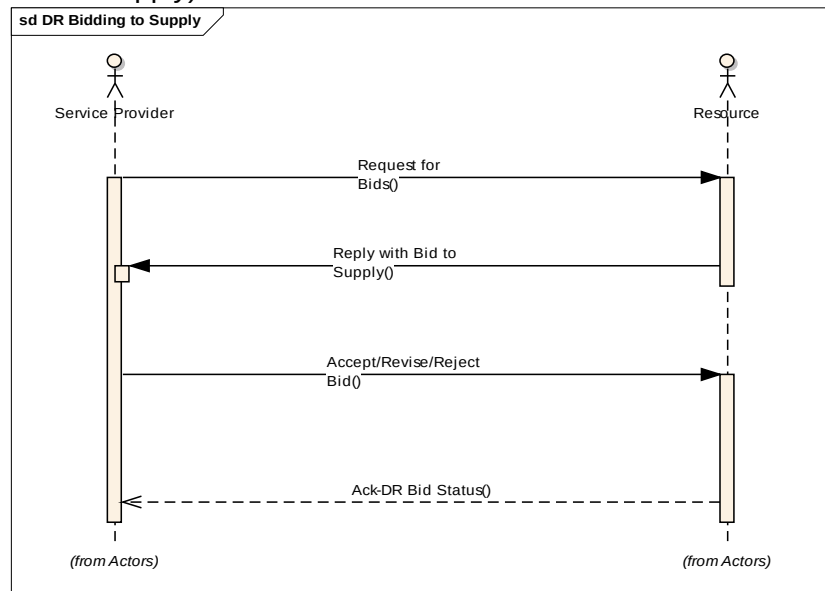
Each offer will have a clearly specified product or service that is being bid and the pricing/incentive structure being offered. The **B**idder also nominates the amount of and nature of supply being offered, the DR Resource to physically provide the service, and other physical parameters affecting **R**esource availability and capability, in addition to the identity (or ID) of the **B**idder and **R**esource(s) that comprise the bid.

The Bid Receiver reviews bids (offers) received and clears them, notifying the bidders of the outcome.

The Bidder receives the notification of awards or **R**esource commitments and uses the information internally in preparation for DR Resource **D**ispatch.

REQ.17.3.2.5.1.2 Sequence Diagram

(Note, the Bid in the following sequence diagram is an offer to supply)



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RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Request Title: Phase Two Requirements Specification for
Retail Standard DR Signals – for NIST PAP09

REQ.17.3.1.42.5.2 DR Bid to Buy

REQ.17.3.2.5.2.1 Description

The Bid Receiver opens the forum/venue for receiving a bid. (This may include initiating the bidding process by sending initial information to Bidders indicating parameters of acceptability for bids to be made). The Bidder communicates a bid to buy a specified product/service and the pricing or other incentive structure the bidder is willing to pay to avoid DR. (This may be as simple as the Retail eCustomer sending a response back to the Bid Receiver that accepts or rejects the initial bid sought, or may involve more complex bid structuring).

Each bid will have a clearly specified product or service that is being bid for purchase and the corresponding pricing structure that is acceptable to the Bidder. The Bidder also includes the quantity of product/service in the bid to buy, and specifies any DR Resource(s) that can physically substitute for the product/service in the event the bid to buy is not cleared (i.e., the bBidder is unwilling to pay more than the going/market outcome price for the product/service). Other information submitted include physical parameters affecting rResource availability and capability, in addition to the identity (or ID) of the bBidder and rResource(s) that comprise the bid.

The Bid Receiver reviews bids received and clears all bids, notifying the bBidders of the outcome. The Bidder receives the notification of resource commitments and uses the information internally in preparation for DR Resource Dispatch.

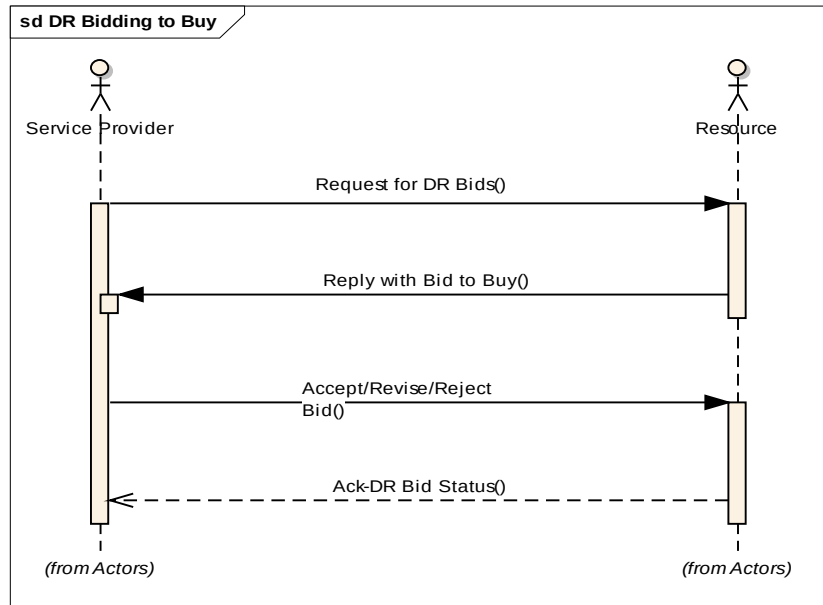
BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.2.5.2.2 Sequence Diagram



BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
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Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.1.42.6 Execute DR Event

The execution of a DR **eEvent** takes different forms depending on operational situation and the type of DR programs being executed. Typically, they fall into one of the following four use cases, see Figure 5:

1. Advanced DR **N**otification
2. Broadcast DR **M**essage (price plus information)
3. DR dispatch instruction
4. DR direct load control.

Operational considerations for DR **eEvent** execution are also associated with DR programs where direct load control or dispatching instructions are carried out.

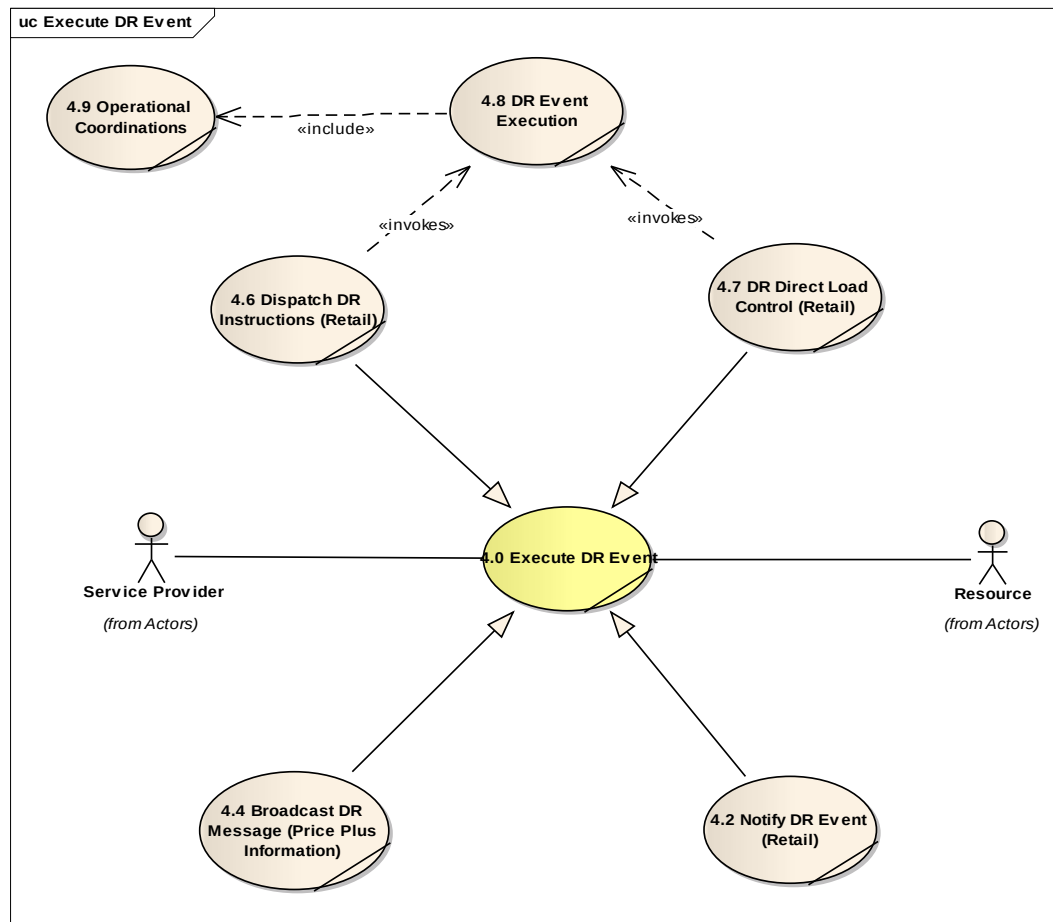


Figure 5. Execute DR Events

BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.1.42.7 Notify DR Event (Retail)

REQ.17.3.1.42.7.1 Advanced Notification for DR (Retail)

REQ.17.3.2.7.1.1 Description

This is used by the Service Provider to send the DR Event notification (i.e., DR signal) to the DR Resource.

The Notify DR Event Mmessage applies to one of three types:

1. Broadcast DR Mmessage (Pprice Pplus Finformation)
2. Dispatch DR Finstructions for Oobjectives (Retail)
3. DR Ddirect Load Ccontrol (Retail).

The message content specific to each of these types is defined in their respective sections below.

REQ.17.3.2.7.1.2 Data Requirements

The following are the data requirements that are common to all of the Event Mmessage Ttypes.

<u>Attribute Name</u>	<u>Description</u>
<u>Program ID</u>	<u>Program Identifier</u>
<u>Program Name</u>	<u>Name of the Program</u>
<u>Service Provider ID</u>	<u>Identifier assigned to the Service Provider</u>
<u>Event ID</u>	<u>Identifier assigned to the DR Event</u>
<u>Event Modification Number</u>	<u>A modification number for the DR eEvent. This is used to indicate if the DR Event has been modified by the UtilityDistribution Company. Each time it is modified, this number is incremented.</u>
<u>Area of Event Notice Applicability:</u> <u>The area affected by the Demand Response Event can be defined by a Location attribute (point location or area) or is applicable to a Resource or to an Asset for Direct Load Control.</u>	
<u>Resource ID</u>	<u>Identifier assigned to the Resource</u>
<u>Asset ID</u>	<u>The unique identifier of the aAsset</u>
<u>Location can be identified by any of the following:</u>	
<u>Service Location ID</u>	<u>Identifier assigned to the Service Location</u>
<u>Address1</u>	<u>Address line 1</u>
<u>Address2</u>	<u>Address line 2</u>
<u>City</u>	<u>City</u>
<u>State/Province</u>	<u>State or Province two-letter code</u>

BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

<u>Attribute Name</u>	<u>Description</u>
<u>Zip/Postal Code</u>	<u>Zip or Postal Code</u>
<u>Country</u>	<u>Country</u>
<u>GPS Coordinates</u>	<u>Latitude and longitude</u>
<u>Weather Station</u>	<u>Weather Station code associated with the Service Location</u>
<u>Zone ID</u>	<u>Identifier assigned to the Zone in which the Service Location is located</u>
<u>Zone</u>	<u>Name of the Zone in which the Service Location is located</u>
<u>Electrical Node ID</u>	<u>Identifier assigned to the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Name</u>	<u>Name of the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Type</u>	<u>Type of Electrical Node at which the Service Location is attached</u>
<u>PNode</u>	<u>Name of the Price Node associated with the Service Location</u>
<u>PNode ID</u>	<u>Identifier assigned to the Price Node associated with the Service Location</u>
<u>The following are other attributes applicable to all DR Event Messages.</u>	
<u>Deployment Type</u>	<u>Type of Deployment. Examples are: Advanced (Normal), Immediate, Audit/Test.</u>
<u>Simple Signal Levels</u>	<u>Used as an alternate and simplified representation of the DR signal, whether it be price based or a dispatch. Takes on a small number of finite levels such as NORMAL, MODERATE, and HIGH, SPECIAL</u>

BGE Comments



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Attribute Name	Description																																				
Criticality Level	This field defines the level of criticality of this event. The action taken by load control devices for an eEvent can be solely based on this value, or combination with other Load Control Event fields supported by this device. For example, additional fields such as Average Load Adjustment Percentage, Duty Cycle, Cooling Temperature Offset, Heating Temperature Offset, Cooling Temperature Set Point or Heating Temperature Set Point can be used in combination with the Criticality level. <table><tr><th>Criticality Level</th><th>Level Description</th><th>Participation</th></tr><tr><td>0</td><td>Reserved</td><td></td></tr><tr><td>1</td><td>Green</td><td>Voluntary</td></tr><tr><td>2</td><td>1</td><td>Voluntary</td></tr><tr><td>3</td><td>2</td><td>Voluntary</td></tr><tr><td>4</td><td>3</td><td>Voluntary</td></tr><tr><td>5</td><td>4</td><td>Voluntary</td></tr><tr><td>6</td><td>5</td><td>Voluntary</td></tr><tr><td>7</td><td>Emergency</td><td>Mandatory</td></tr><tr><td>8</td><td>Planned Outage</td><td>Mandatory</td></tr><tr><td>9</td><td>Service Disconnect</td><td>Mandatory</td></tr><tr><td>0x0A to 0x0F</td><td>Utility Defined</td><td>Utility Defined³</td></tr></table>	Criticality Level	Level Description	Participation	0	Reserved		1	Green	Voluntary	2	1	Voluntary	3	2	Voluntary	4	3	Voluntary	5	4	Voluntary	6	5	Voluntary	7	Emergency	Mandatory	8	Planned Outage	Mandatory	9	Service Disconnect	Mandatory	0x0A to 0x0F	Utility Defined	Utility Defined ³
Criticality Level	Level Description	Participation																																			
0	Reserved																																				
1	Green	Voluntary																																			
2	1	Voluntary																																			
3	2	Voluntary																																			
4	3	Voluntary																																			
5	4	Voluntary																																			
6	5	Voluntary																																			
7	Emergency	Mandatory																																			
8	Planned Outage	Mandatory																																			
9	Service Disconnect	Mandatory																																			
0x0A to 0x0F	Utility Defined	Utility Defined ³																																			
Baseline Dates	Dates of days used to calculate the Energy Baseline																																				
Baseline Exclusion Dates	Dates of days Excluded from the calculation of the Energy Baseline																																				
Energy Baseline Value	Calculated Energy Baseline																																				
Energy Baseline Timestamp	Timestamp of Energy Baseline																																				
Deployment Period (Interval): The deployment period that is communicated to a Resource or Asset is an interval contained within the Start or End Time of the Event, but not necessarily for the entire Event.																																					
Event Start Time	Time of Start of deployment period for Event																																				
Event End Time	Time of End of deployment period																																				

³ Requirement as defined by the ZigBee Smart Energy Profile™ 2.0 Technical Requirements Document

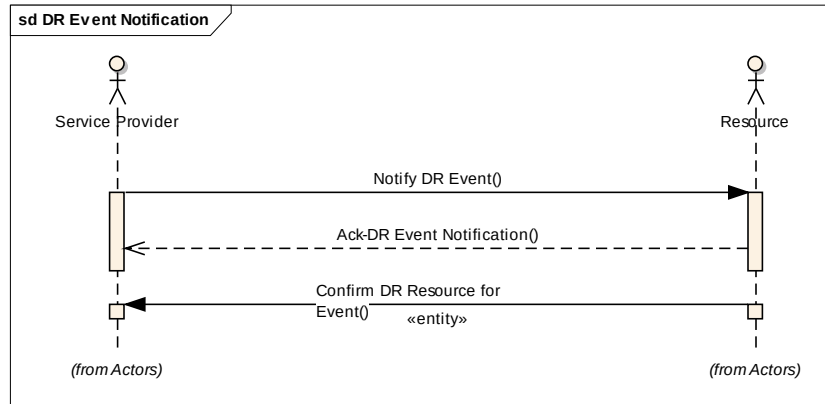
BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
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Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.2.7.1.3 Sequence Diagram



BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
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Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.1.42.7.2 Update a DR Event (Retail)

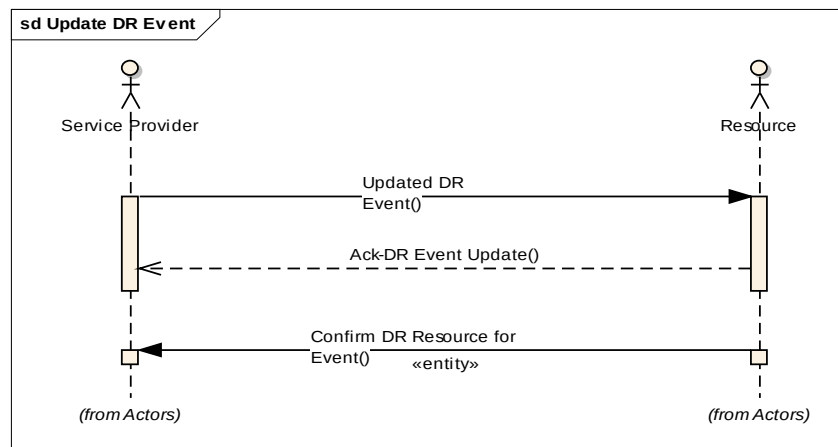
REQ.17.3.2.7.2.1 Description

This is used to update a DR eEvent that has been previously notified. The requirements for this use case are the same as those for the "Advanced Notification for DR" use case.

Data Requirements

<u>Attribute Name</u>	<u>Description</u>
<u>Event</u>	<u>See the "Advanced Notification for DR" use case.</u>
<u>Event Modification Number</u>	<u>This is Modification number of the DR event. It is used to indicate that the DR Event has been modified by the Utility or Service Provider. Each time a DR Event is modified, this number is incremented.</u>
<u>Modification reason code</u>	<u>The reason the event was modified.</u>

REQ.17.3.2.7.2.2 Sequence Diagram



BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.1.42.7.3 Cancel a DR Event (Retail)

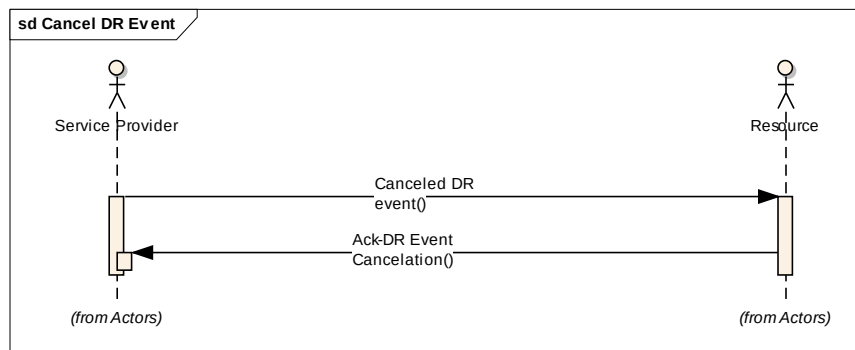
REQ.17.3.2.7.3.1 Description

This is used by the Service Provider to notify the DR Resource that a DR Event is being cancelled. It should only be executed if a DR Resource has previously received notification of a DR Event and that event has subsequently been cancelled.

Data Requirements

Attribute Name	Description
<u>Modification reason code</u>	<u>The reason the eEvent is being cancelled.</u>
<u>Event Status</u>	<u>Status of the Event</u>
<u>DR Event Identifier</u>	<u>An identifier for the eEvent that is being cancelled.</u>
<u>Effective date/time</u>	<u>The date and time a cancellation takes effect.</u>

REQ.17.3.2.7.3.2 Sequence Diagram



BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
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Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.1.42.7.4 DR Resource Confirmation (Retail)

REQ.17.3.2.7.4.1 Description

This is a confirmation message that is sent by a DR Resource to the Service Provider as a result of receiving a DR Signal from the Service Provider. It may be used as an acknowledgement of the receipt of the DR signal, but it may also contain various information used to signify how the DR Resource will respond to the DR Signal.

Any changes to the Resource or Asset that may impact participation or performance for the Event (such as Location and Load Profile) shall be provided through the Update Resource or Update Asset Messages.

REQ.17.3.2.7.4.2 Data Requirements

<u>Attribute Name</u>	<u>Description</u>
<u>Resource ID</u>	<u>Identifier assigned to the Resource</u>
<u>Asset ID</u>	<u>The unique identifier of the ~~a~~Asset</u>
<u>Exception Conditions</u>	<u>This is used to report that the ~~l~~Load controller may not behave as commanded because of a variety of conditions including:</u> • <u>Faults in device</u> • <u>Retail Customer override.</u>
<u>Load Control State</u>	<u>The state of the ~~l~~Load, which includes both commanded states and user settings. This may include a schedule of future states if a particular control algorithm for the ~~l~~Load controller is being executed.</u>
<u>Operational Constraints</u>	<u>Operational Constraints at run time may differ from those provided at Enrollment, and will be applicable only to the time interval of the Event for this Resource or Asset.</u>
<u>Constraint Type</u>	<u>Type of operational, schedule or offer constraint</u>
<u>Constraint Interval</u>	<u>The timeframe over which the constraint type applies.</u>
<u>Constraint Value</u>	<u>Value of the Constraint Type and Interval</u>
<u>Offer Dispatch Status</u>	<u>Dispatch Status of Offer</u> <u>a.k.a. as “Opt-in” or “Opt-out” in existing programs.</u>

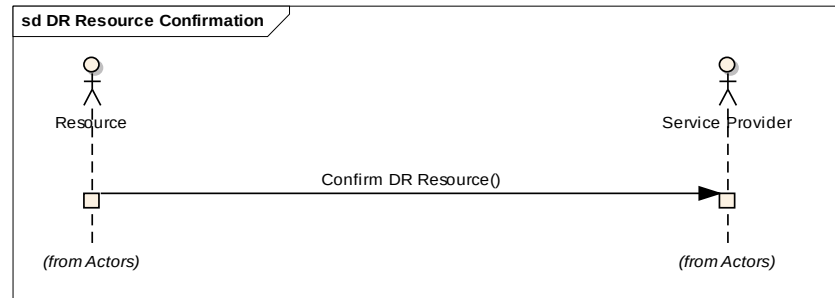
BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.2.7.4.3 Sequence Diagram



REQ.17.3.1.42.8 Broadcast DR Message (Price Plus Information)

REQ.17.3.2.8.1 Description

Demand Response programs are designed to address different power system concerns caused by the imbalance between generation, transmission and consumption, or environmental concerns. Some DR programs are conducted on a voluntary basis, where the Retail eCustomer can opt to maintain the level or Load. Some DR programs are mandatory, where either the Retail eCustomer Loads will be curtailed under certain conditions or the Retail eCustomer will incur financial penalties for noncompliance.

In retail markets, certain “DR Messages” can be broadcasted to DR rResources either directly or through Service Providers. DR Message is defined as information about the DR sSignals that may affect the dDemand behaviors of the energy consumers Retail Customers. Obviously, the main component of the DR Message is the pricing information. However, there are other attributes of energy being delivered that may be of interest to energy consumers Retail Customers and could be included in the DR Message.

Based on the OpenADR discussion, the broadcasting function is mainly used for volunteer or non-mission critical DR mMessages. Therefore, DR mMessage acknowledgement or confirmation is optional.

REQ.17.3.2.8.2 DR Source of Power/Generation

“DR Message” also can be source of power or generation. ANSI C12.19-2008 defined the following source of power/generation in Standard Table 12.

Precondition:

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RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

The DR Service Provider sends the DR message to service providers. In the case of DR pricing, the DR Service Provider calculates the price per location and communicates the appropriate price associated with the DR product to service providers.

Post Condition:

DR Resources received the DR pricing information, and may or may not act based on the DR agreement or contract.

REQ.17.3.2.8.3 Data Requirements

<u>Attribute Name</u>	<u>Description</u>
<u>Currency</u>	<u>Economic unit of exchange in which the total price and price components are stated (e.g. dollars, euros)</u>
<u>Product Price</u>	<u>The sum of all Price Component Values for a given product (Total Price).</u>
<u>Product Price Factor</u>	<u>Terms of use attribute of Product Price</u> <u>Examples: Price absolute, Price relative, Price multiplier</u>
<u>Unit of Measure</u>	<u>Attribute of Product Identifier</u>
<u>Delivery Time</u>	<u>Time at which the product is available for physical consumption</u>
<u>Delivery Interval</u>	<u>The duration over which the product is available for physical consumption</u>
<u>Market Product (Product Type)</u>	<u>Market Product</u> <u>Product types include the following: energy, capacity, regulation, operating reserves (spinning or non-spin).</u>

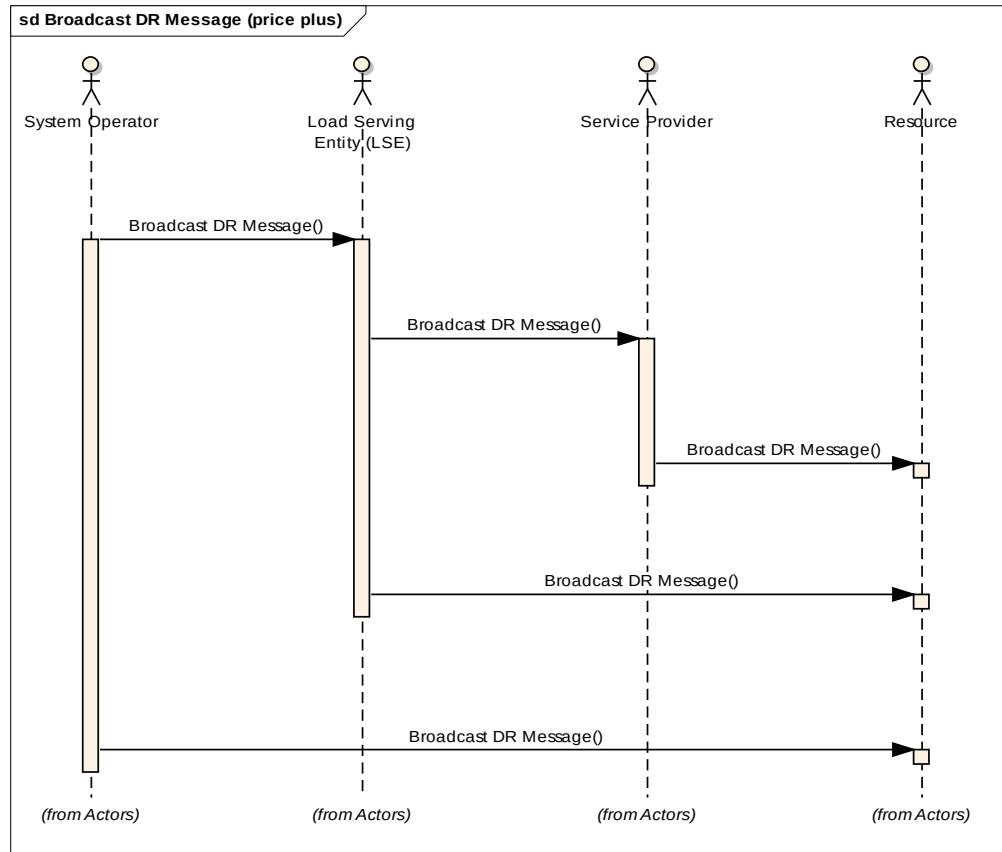
BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
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Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.2.8.4 Sequence Diagram



REQ.17.3.1.42.9 Dispatch DR Instructions (Retail)

REQ.17.3.2.9.1 Description

This interaction is used to dispatch DR Resources. This type of interaction is used when the Service Provider needs to achieve specific objectives from the DR Resources during DR eEvents. This means that specific instructions will be given to the DR Resource with objectives (e.g. shed 100 kW) for the Load profile of the DR Resource.

Note that for the retail use cases, a Dispatch is considered a special type of DR Notification, and thus, it is very similar in nature to the requirements given for that interaction.

BGE Comments



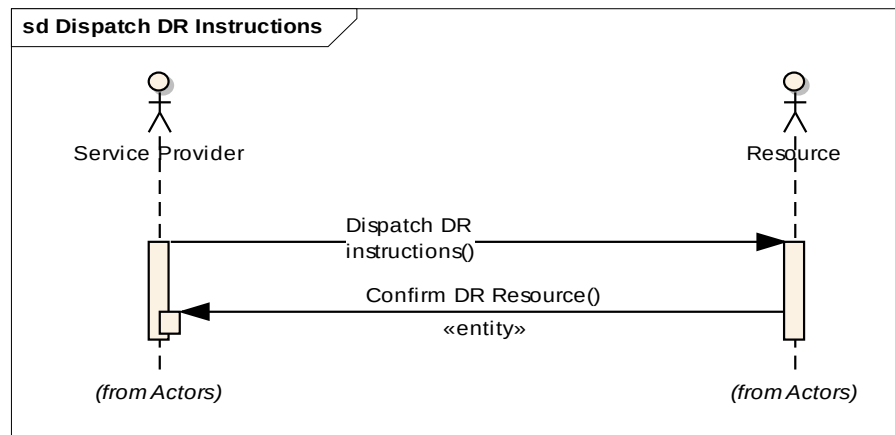
RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.2.9.2 Data Requirements

Attribute Name	Description
DR Dispatches for DR Objective based messages are of three types.	
• ~~LOAD LEVEL~~ Load Level	
• ~~LOAD AMOUNT~~ Load Amount	
• ~~LOAD PERCENTAGE~~ Load Percentage	
For Load Level: <u>Load Level Value</u>	Value of the load level to be achieved based on a set of enumerated values. (e.g. moderate, high, etc)
For Load Amount: <u>Deployment MW</u>	Deployment quantity expressed as an ~~A~~ bsolute
For Load Percentage: <u>Deployment MW</u>	Relative Deployment quantity expressed as %.

REQ.17.3.2.9.3 Sequence Diagram



REQ.17.3.1.42.10 DR Direct Load Control (Retail)

REQ.17.3.2.10.1 Description

This use case covers direct interactions between the DR Service Provider and a specific DR Asset for the purposes of putting that ~~a~~Asset into a specific ~~l~~oad control state (e.g., to turn it on or off). In this case, the DR Asset is a DR Resource with only one DR Asset, and thus, the interaction is directly with the DR Asset.

See REQ.17.3.1.42.11.3, DR Execution - Direct Load Control (DLC) for more details.

BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.2.10.2 Data Requirements

<u>Attribute Name</u>	<u>Description</u>
<u>Asset ID</u>	<u>The unique identifier of the aAsset</u> <u>(Note: Direct Load Control messages are applicable only to Assets)</u>
<u>Status Check</u>	<u>A signal to require the DR rResource status to be sent back.</u> <u>(Only applicable to Direct Load Control)</u>
<u>DR Control Command: Direct Load Control Type</u>	<u>The type of DR Direct Load Control Command: e.g. Set Point, Open/Close, Heating Temperature - offset/setpoint, Cooling Temperature - offset/setpoint, Load adjustment offset</u>
<u>DR Control Command: Direct Load Control Value</u>	<u>Value associated with the Direct Load Control Type.</u>
<u>Event Start Time</u>	<u>Time of Start of deployment period for Event</u>
<u>Event End Time</u>	<u>Time of End of deployment period</u>
<u>Duty Cycle</u>	<u>"Duty Cycle : Defines the maximum On state duty cycle as a percentage of time. Example, if the value is 80, the device would be in an "on state" for 80% of the time for the duration of the event. Range of the value is 0 to 100. A value of 0xFF indicates the field is not used." (from SEP2.0) ³⁴</u>
<u>Event Control</u>	<u>Event Control options for randomized start or end times:</u> <u>1= Randomize Start time, 0=Randomized Start not Applied</u> <u>1= Randomize End time, 0=Randomized End not Applied. (from SEP2.0) ³⁴</u>
<u>Device Class</u>	<u>Enumeration representing the Device Class to apply the current Load Control Event. ³⁴</u>

REQ.17.3.2.10.3 Sequence Diagram

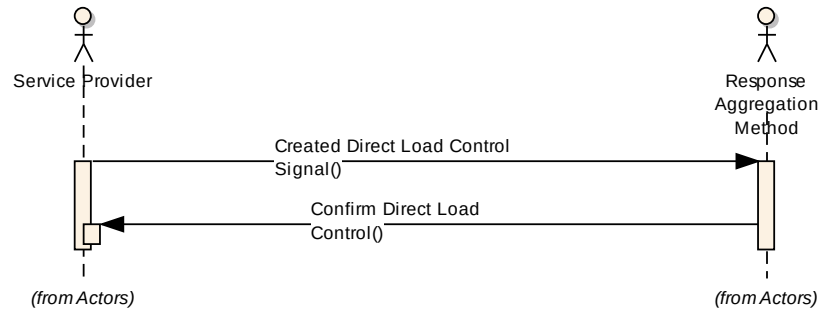
BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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sd Direct Load Control



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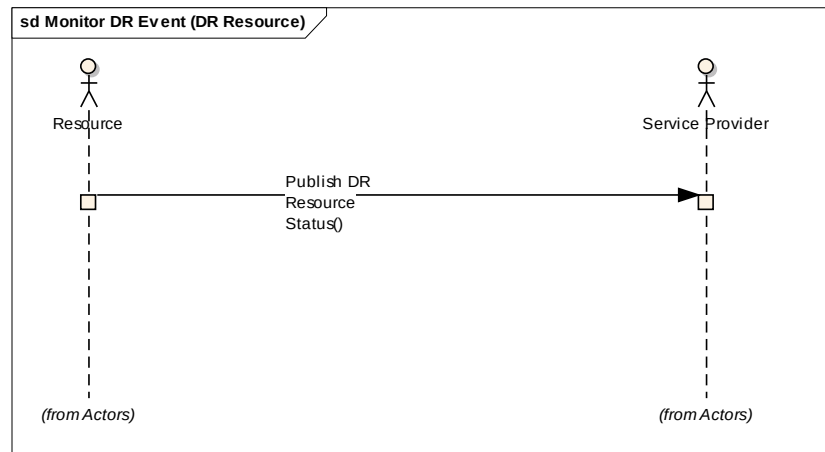
For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
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REQ.17.3.1.42.10.111 Monitor DR Event (DR Resource)

REQ.17.3.2.11.1 Description

This interaction is used to monitor a DR Resource's behavior. It may be executed as a result of the DR Resource receiving a DR signal or it may be conducted continuously.

REQ.17.3.2.11.2 Sequence Diagram

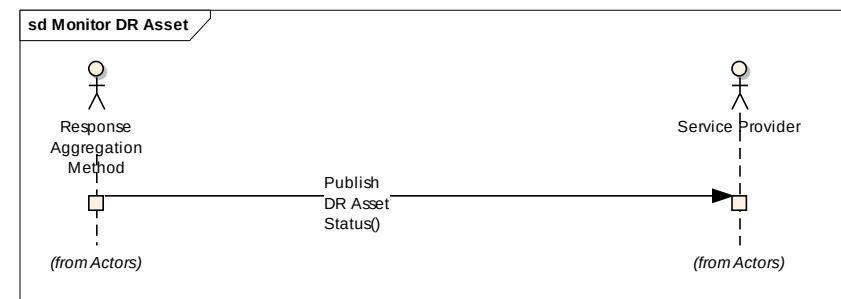


REQ.17.3.1.4.10.22.12 Monitor DR Event (DR Asset)

REQ.17.3.12.1 Description

This interaction is used to monitor the state of a DR Asset. It may be executed as a result of the DR Asset receiving a DR sSignal or it may be conducted continuously.

REQ.17.3.12.2 Sequence Diagram



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REQ.17.3.1.4.112.13 DR Event Execution

Demand Response is deployed for economic or a reliability purposes. At high penetration levels, ~~d~~Demand ~~r~~Response has to be integrated with the power supply scheduling process, and it may impact the distribution grid operation and reliability, and perhaps the transmission grid operation and reliability. Thus it is important to include the required considerations for the grid and system level operations when developing DR ~~Use Cases~~ and DR ~~Signal standards~~Model Business Practices. Such impacts may not be significant at low penetration levels; however, proper considerations must be given to support scalability and expandability for future deployments.

Power system operates based on a real-time balancing of supply and ~~d~~Demand. To economically schedule the supply, an accurate load forecast is needed. Traditionally, ~~l~~Load forecast was generated using the historical ~~consumption usage~~ patterns, weather forecast and other similar parameters. With the potential of high-penetration of DR, it will be necessary to incorporate the planned or forecasted DR levels into the ~~l~~Load forecast. Also, DR capabilities can be used to support the power system capacity or emergency supply (ancillary service) needs. Such services require proper scheduling and monitoring capabilities.

A ~~d~~Demand ~~r~~Response ~~e~~Event may be initiated by a power system operator in response to a reliability event, e.g., loss of a generating station causing a lack of supply to meet ~~d~~Demand, or an uncontrolled set of PEVs overloading of a distribution transformer. A ~~d~~Demand ~~r~~Response ~~e~~Event may also be initiated by ~~utility—Distribution Company~~ operational systems based on economic considerations, e.g., reducing or shifting peak ~~l~~Load at the system level or at specific feeder or facility. Demand ~~r~~Response may also be initiated by a Retail eCustomer in response to a market pricing signal

Considering that the distribution grid in the US is typically a three-phase imbalance circuit, i.e., many retail eCustomers are on a single-phase or two-phase of the three-phase system. Thus, significant changes in Retail eCustomer lLoad patters could result in undesirable imbalanced conditions on a feeder. Also, ~~l~~Load pickup following the termination of a major DR ~~e~~Event could possibly cause overloads and other operational problems, if the ~~l~~Load pickup is not properly scattered/managed.

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The following provides three representative use cases to highlight some the key interactions. These include:

- Dynamic ~~P~~price-based DR
- Notification-based DR
- Direct Load Control

REQ.17.3.1-~~4.112.13.1~~ DR Execution – Retail Time Pricing (RTP)

REQ.17.3.2.13.1.1 Description

Provide ~~r~~Real-~~t~~Time or dynamic ~~p~~ricing (RTP) to ~~r~~Retail ~~e~~Customers so that Retail eCustomers can vary their ~~d~~Demand based on pricing signals. ~~RTP represents retail electricity rates that vary as a function of time~~ (Defined term – no explanation necessary)

Traditionally, retail tariff ~~has provisions~~ are based on a fixed or tiered rate structure with possible considerations of static rates for pre-established time of use (TOU) conditions. ~~Real time or dynamic pricing (RTP)~~ represents retail electricity rates that could vary as a function of time and is intended to modify ~~d~~Demand. It requires interval metering for accurate billing based on time-varying prices. A number of states have implemented RTP or other dynamic pricing tariffs for large Retail eCustomers. With a broader deployment of advanced meters, RTP rates may become more common nation-wide.

The scenario presented here represents a case where a location-dependent ~~r~~Real-~~t~~Time ~~retail p~~ricing for energy is established based on the Locational Marginal Price (LMP) for that location. LMP values are typically established by an ISO (for regions covered by an ISO/RTO) on a day-ahead (hourly resolution) and real-time basis, typically on a five minute resolution. For the RTP, it may be appropriate to use the real-time LMP as the basis for computing the retail dynamic tariff. However, decisions should be made on the time and the spatial resolution of the RTP. For example, an hourly RTP averaging the five minute pricing values, or a Critical Peak Pricing model to reflect the extreme conditions only, may be adopted. In addition to the energy price, the retail RTP rate may also include the appropriate uplift charges to cover for distribution wire/services charges and for the power loss compensations. Note that the uplift charges are typically subject to a regulatory review and approval.

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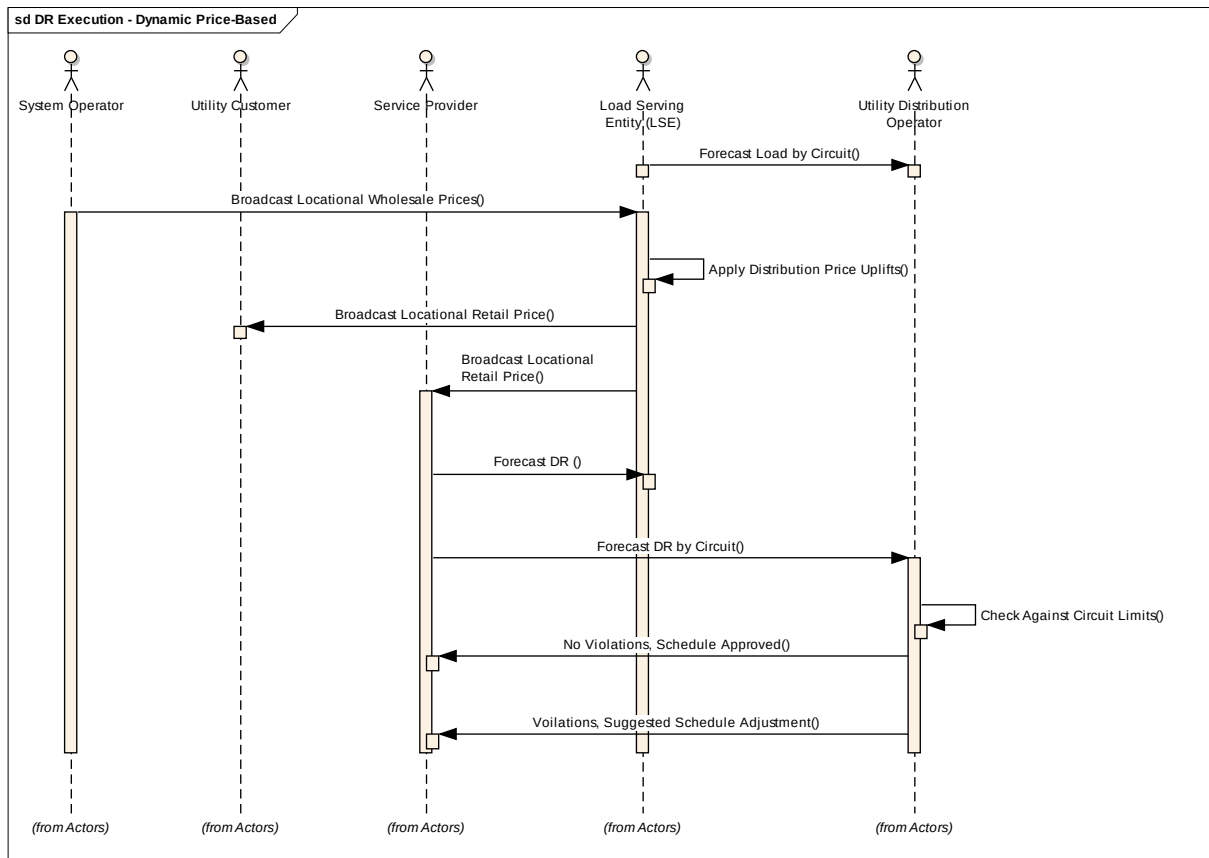


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Special care must be given to the RTP rate design to ensure Retail eCustomer acceptance and adaptation. Also grid operational issues may have to be addressed. For example, during low LMP (RTP) periods (e.g., at night), certain distribution circuits may get over loaded (congested), with Retail eCustomers shifting consumption usage, e.g., charging PEVs, to that period. This improves the overall system economy, but may cause circuit congestion. To combat this, some have proposed use of eDemand charges or an additional incentive payment for Load reduction, a locational incentive to relief congestion.

REQ.17.3.2.13.1.2 Sequence Diagram



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REQ.17.3.1.4.112.13.2 DR Execution – Notification Based

REQ.17.3.2.13.2.1 Description

Notification-based DR is mostly used for economic purposes based on a day-ahead or hours or hour-ahead basis. Notification-based DR may also be used for reliability events when the ~~system operator~~Program Administrator expects a contingency or operating condition (e.g., congestion or planned outage) on the distribution or the transmission grid that requires a reduction (or an increase) on the load at a given location.

Considering that the business processes for ~~d~~Demand ~~r~~Response have not yet been standardized across the ~~nations~~Country, the following is a representative scenario that captures some of the interactions between the key stakeholders (~~a~~Actors).

At high penetration levels, the DR operation, especially on a day-ahead or hour ahead basis, need to be coordinated with the overall operations and supply scheduling process. As is shown in the Sequence Diagram below, this may require a timely update of the “locational” ~~l~~Load forecast and an up-to-date nomination of the DR capabilities. This information may be supplied to the “system” and/or market operator to be incorporated in the overall supply and ~~d~~Demand scheduling process. The DR capabilities are specified by the DR Provider to the ~~System Operator~~Program Administrator based on a DR Program, a price curve, or other nomination protocol. The DR Provider may also inform the Load Serving Entity (LSE) of the locational available DR capabilities.

The notification-based DR dispatch process is typically initiated by the ~~System or Market Operator~~Program administrator; the process may also be initiated by an LSE or UDO. It is also possible that the DR Provider be the initiator of the DR process based on a market opportunity (economic operation) or based on a pre-established program.

At high DR penetration levels, it is expected that the DR provider will need to clear the DR schedule with the Distribution Company Grid Operator, ~~the UDO~~. This is to insure that the high penetration DR has no adverse impact on the distribution grid reliability and power quality, e.g., cause of excessive imbalances, voltage violation, or an overload during ~~l~~Load pickup period. The ~~UDO~~Distribution Company Grid Operator, in a timely fashion, will inform the DR Provider, if the

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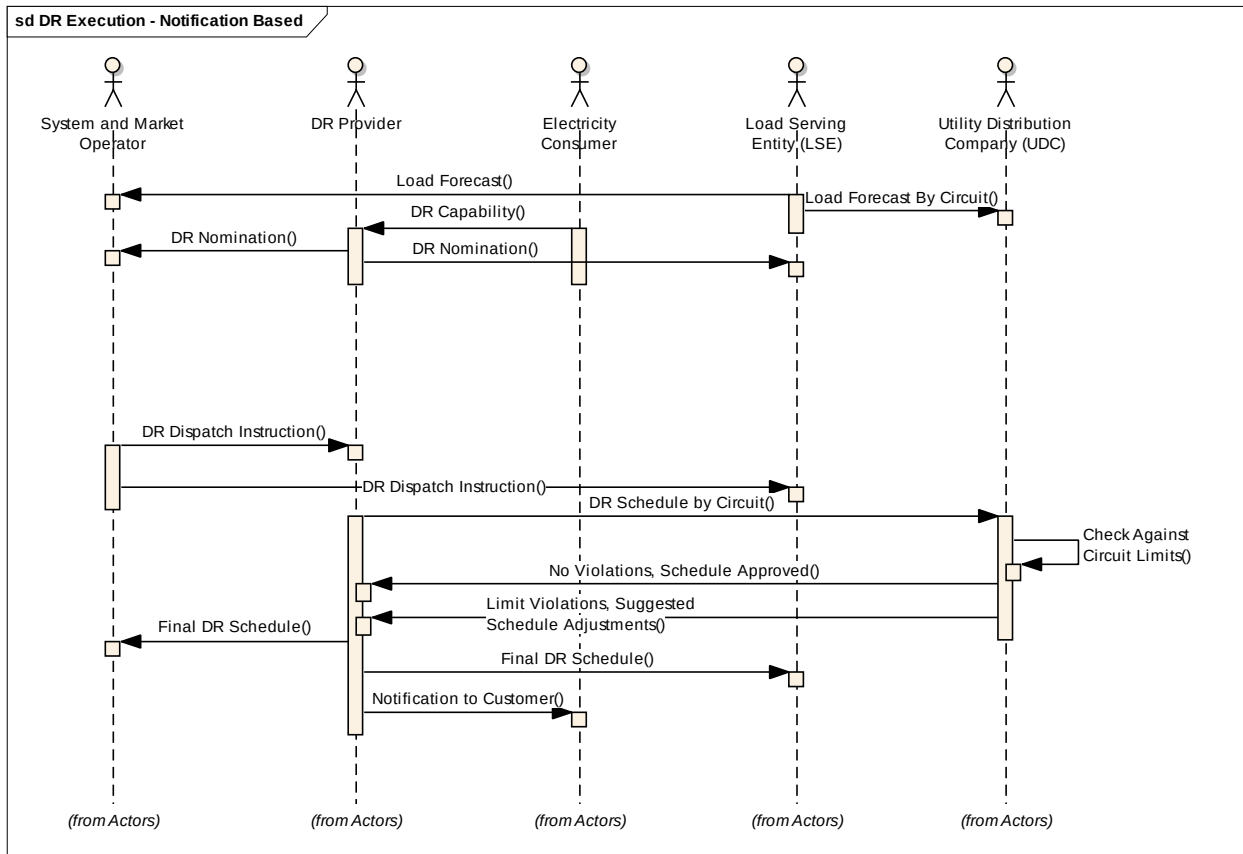
RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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schedule is cleared or requires an adjustment. Please note that if the DR deployed by a utility-Distribution eCompany that includes both LSE and UDO-Distribution Company Grid Operator functions, such coordination is performed within the Distribution eCompany's operational systems (e.g., DRMS, DMS, etc.), or it can be an integral part of the DR scheduling application.

Following the clearing the DR schedule, notifications are sent to Retail eCustomers for DR operation. Under this scenario, the Market Operator and the LSE are also informed of the final DR schedule.

REQ.17.3.2.13.2.2 Sequence Diagram



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REQ.17.3.1.4.112.13.3 DR Execution – Direct Load Control (DLC)

REQ.17.3.2.13.3.1 Description

Direct-Load Control is typically used for reliability-based events such as contingency and emergency support, supply of balancing energy or other ancillary service. Many of these programs require quick response time, e.g., five minutes or faster, that is practically only possible through a DLC capability. Direct-Load Control may also be used for economic operations, e.g., water heater programs to reduce or shift peak load.

Considering that the business processes for ~~d~~Demand ~~r~~Response have not yet been standardized across the ~~nations~~Country, the following is a representative DLC scenario that captures the interactions between the key stakeholders (actors).

Direct Load Control is typically called for by a ~~system operator~~Program Administrator, ~~a transmission or distribution operator~~. It could be also issued by a Market Operator based on an ancillary service DR award, or by an LSE or DRP for an economic purpose. At high penetration levels, DLC operation needs to be coordinated with the ~~d~~Distribution ~~Company~~ ~~g~~Grid ~~o~~perator, ~~the~~ ~~UDO~~.

As is shown in the sequence diagram below, the ~~Retail~~ ~~e~~Customer DR capabilities are aggregated by location and specified/nominated to the Distribution ~~Company~~ Grid Operator, Load Serving Entity, and/or to the ~~System/Market Operator~~Program Administrator. In addition to location, the capabilities may also be aggregated by the DR response time, e.g., four seconds, five minutes, 30 minutes, etc.

The DLC Dispatch process is typically initiated by the ~~Transmission or Distribution Operator~~Program Administrator. ~~The process may also be initiated by the Market Operator or the LSE.~~ The actual control of the DR resources may be done by the DR provider based on the dispatch signal received.

At high DR penetration levels, it is expected that the DLC activation schedule to be coordinated with the Distribution ~~Company~~ Grid Operator, ~~the~~ ~~UDO~~. This is to insure that there are no adverse impacts on the distribution grid reliability and power quality, e.g., voltage violation, excessive phase imbalances, or an overload during load pickup period. If the DLC deployed by a ~~utility~~ ~~Distribution~~ ~~e~~Company such coordination can be accomplished within the Distribution

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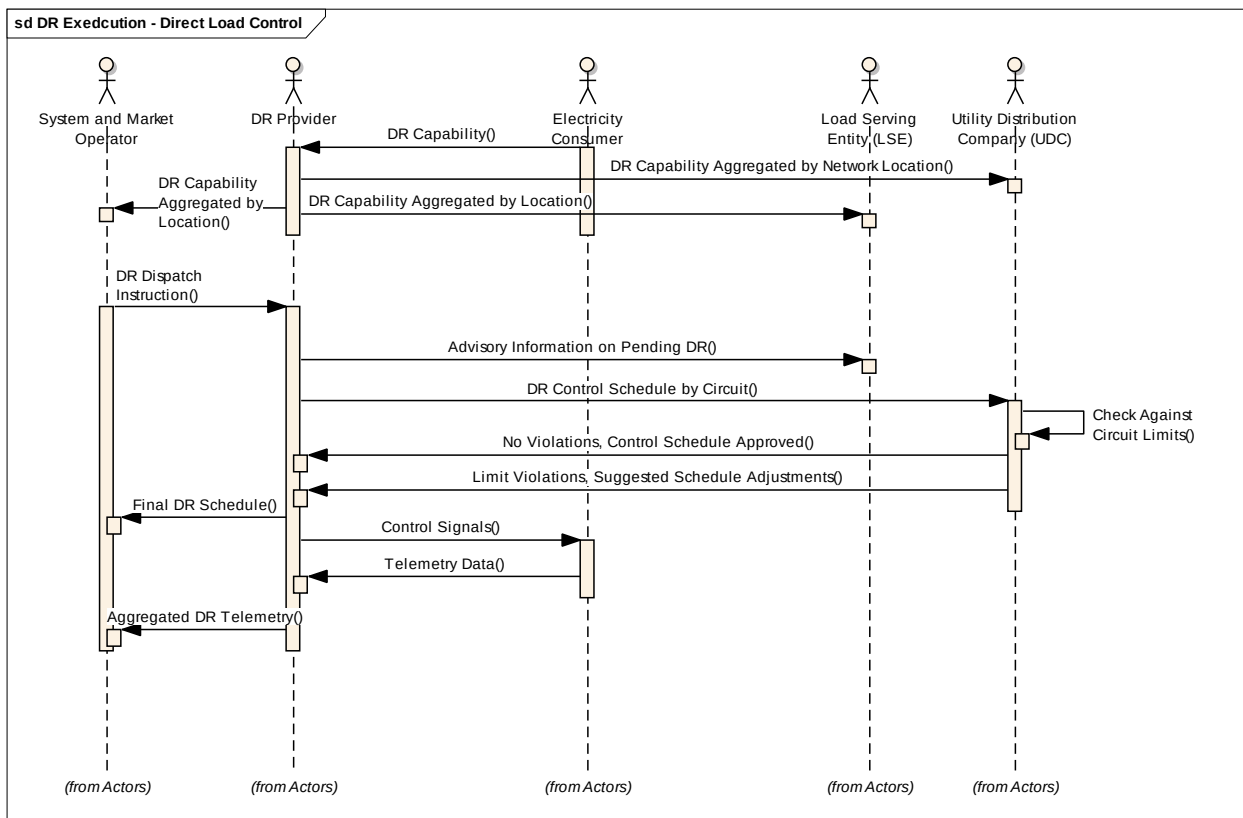
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Company's DR and distribution management systems, or performed as an integral part of the DR control functions.

For a "fast" DR, e.g., provision of ancillary services, a telemetry capability is required to enable the real-time monitoring of the Resource condition and its response to the DR control signal.

REQ.17.3.2.13.3.2 Sequence Diagram



REQ.17.3.1.4.122.14 Operational Coordination

Due to the existing differences in the regional retail energy market regulations, wholesale market structure and protocols, and supply and Demand conditions, currently there are regional differences in business practices and processes governing Demand Response. As a result, operational coordination requirements for Demand Response somewhat vary from region to region, depending on the available retail tariff, retail market structure, available wholesale market for DR and the market mechanics.

The following table summarizes the major roles and responsibilities of the key stakeholders with respect to Demand Response operation.

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As can be seen in this table, a significant level of stakeholder coordination is required for an end-to-end DR operation spanning from the wholesale markets to the end-use customers.

(Why are Wholesale stakeholders included in Retail Model Business Practices???)

Stake Holder	Key Responsibilities
Wholesale Market Operator	- Establish, administer, and operate wholesale ~~d~~Demand ~~r~~Response programs and markets; - Determine and publish locational prices for wholesale ~~d~~Demand ~~r~~Response products; - Improve energy market efficiencies (economics) by integrating ~~d~~Demand ~~r~~Response products and capabilities; - Monitor compliance to wholesale DR instructions and financially settle with the participating stakeholders.
Transmission Grid / System Operator - Balancing Authority	- Monitor and maintain transmission grid reliability, and call upon wholesale ~~demand-side~~ (~~d~~Demand ~~r~~Response) capabilities to address contingency/emergency conditions; - Dispatch ~~demand-side~~ Demand Response capabilities to balance supply and ~~d~~Demand, e.g., mitigating impact of variable generation (e.g., wind). - In regions with no organized wholesale energy market, economically dispatch available generation and demand resources including demand response to optimize supply economics.

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Stake Holder	Key Responsibilities
Distribution ~~Company~~ Grid Operator ~~Utility~~ ~~Distribution~~ ~~Company~~	- Monitor and maintain the distribution grid reliability and the quality of power supply (e.g., voltage levels). Call upon DR to mitigate the distribution contingencies and reliability concerns. - Review and approve the integration of distributed energy resources with the distribution grid. - Assess the operational impact of distributed resources and ~~d~~Demand ~~r~~Response (DR/DER) on power quality and reliability of the distribution grid, approve high-penetration DR schedules (especially cold-load pickup operation). - Coordinate with the respective Load Serving Entity and Energy Service Providers for the assessment of distribution service and loss compensation charges to retail customers.
Load Serving Entity	- Forecast load and economically schedule supply to meet ~~d~~Demand at all times. Incorporate ~~d~~Demand ~~r~~Response capabilities to improve load factor, reducing/shifting peak load. - Establish and obtain regulatory approval for a fair and unbiased retail tariff for all <u>Retail</u> <u>e</u>Customer classes. For ~~r~~Real-~~t~~Time <u>dynamic</u> <u>p</u>Pricing (RTP) tariff, apply distribution service, loss compensation and other uplifts to the wholesale locational prices. - Establish and administer ~~d~~Demand ~~r~~Response and distributed resource management programs including DR tariff. - Meet regional requirements for Renewable Portfolio Standards compliance for power delivery. - Aggregate and schedule DR capabilities in wholesale markets, manage DR programs. - Manage <u>Retail</u> <u>e</u>Customer metering and billing process.

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Stake Holder	Key Responsibilities
Power Marketer	- Forecast ~~I~~Load and economically schedule supply to meet ~~d~~Demand at all times. Incorporate ~~d~~Demand ~~r~~Response capabilities to improve load factor, reducing/shifting peak ~~I~~Load. - Establish and obtain regulatory approval for a fair and unbiased retail tariff for all ~~Retail~~ ~~e~~Customer classes. For ~~r~~Real-~~t~~Time ~~dynamic~~ ~~p~~Pricing (RTP) tariff, apply distribution service, loss compensation and other uplifts to the wholesale locational prices. - Operate a wholesale and/or retail ~~d~~Demand ~~r~~Response programs with wholesale and/or ~~r~~Retail ~~e~~Customers.
Energy Service Provider	- Operate only in regions with competitive retail market - Be an alternative ~~s~~Supplier of electric power to <del>end-use</del>~~Retail~~ ~~e~~Customers by offering competitive products, services and prices. - Forecast aggregated ~~I~~Load of the ~~e~~Enrolled ~~Retail~~ ~~e~~Customers by location as required. - Coordinate the power supply with the respective LSE and UDO. - Support ~~d~~Demand ~~r~~Response programs (DR/DER) for ~~e~~Enrolled ~~Retail~~ ~~e~~Customers. - Aggregate ~~d~~Demand and ~~d~~Demand-<del>side</del>~~Response~~ capabilities; schedule the aggregated ~~I~~Load and DR capabilities in wholesale markets. - Provide for DR telemetry and other monitoring requirements, on a ~~r~~Resource or aggregated basis. - Apply the necessary uplifts (e.g., distribution service and loss compensation charges) to the wholesale locational prices. - Meet regional requirements for Renewable Portfolio Standards compliance for power delivery. - Bill and settle with ~~Retail~~ ~~e~~Customers for energy supply and DR operation.

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Stake Holder	Key Responsibilities
Demand Response Provider	- Offer competitive ~~d~~Demand ~~r~~Response services to the ~~end-use~~Retail ~~e~~Customers. - Design and manage DR programs, establish pricing structure and signals for DR operation - Aggregate ~~d~~Demand and ~~d~~Demand-side <u>Response</u> capabilities; and offer/schedule these capabilities with the respective LSE or the wholesale market. - Provide for DR telemetry and other monitoring requirements, on a resource or aggregated basis. - Bill and settle with <u>Retail e</u>Customers for energy supply and DR operation.
~~Electricity~~ <u>Retail</u> Customer	- Subscribe to a DR program, and update DR availability and capability information as appropriate - Maintain DR resources, data communications, telemetry, metering and control devices as required. - Respond to pricing signals, DR notifications, or control signals as appropriate.

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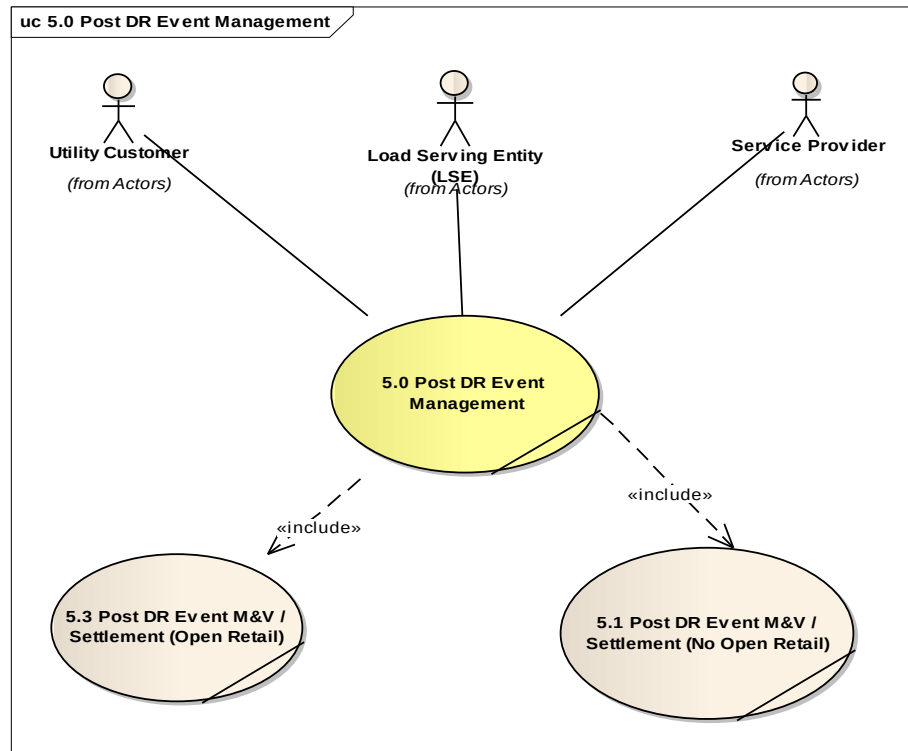


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REQ.17.3.1.4.132.15 Post DR Event Management

Post DR ~~e~~Event management mainly concerns with the reconciliation of the actual ~~consumption~~ usage of energy within the duration of a DR ~~e~~Event with the expected behavior so that proper financial reward or penalties could be carried out. ~~The NAESB M&V standard for DR defines the requirements for most of the post event management.~~ The following use cases describe post DR ~~e~~Event management for three different market types.



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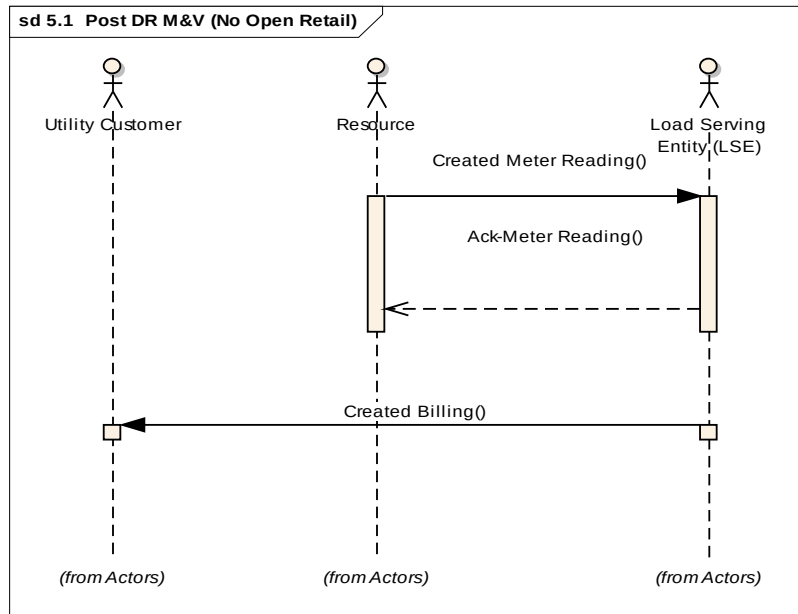
For Quadrant: Retail Electric Quadrant
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REQ.17.3.1.4.132.15.1 Post DR Event M&V / Settlement (No Open Retail)

REQ.17.3.2.15.1.1 Description

After DR Event has been completed, then Measurement and Verification (M&V) can confirm whether action has been taken or to measure the impact of the response. After the M&V, then the ~~F~~inancial ~~S~~ettlement is calculated and sent to the ~~E~~lectricity ~~R~~etail Customer⁴. This ~~U~~se ~~C~~ase covers the scenarios with no Open Retail Markets.

REQ.17.3.2.15.1.2 Sequence Diagram



⁴ In wholesale markets, the settlement for a DR Event is between the System Operator and Market Participant and possibly between the Market Participant and the Electricity Customer.

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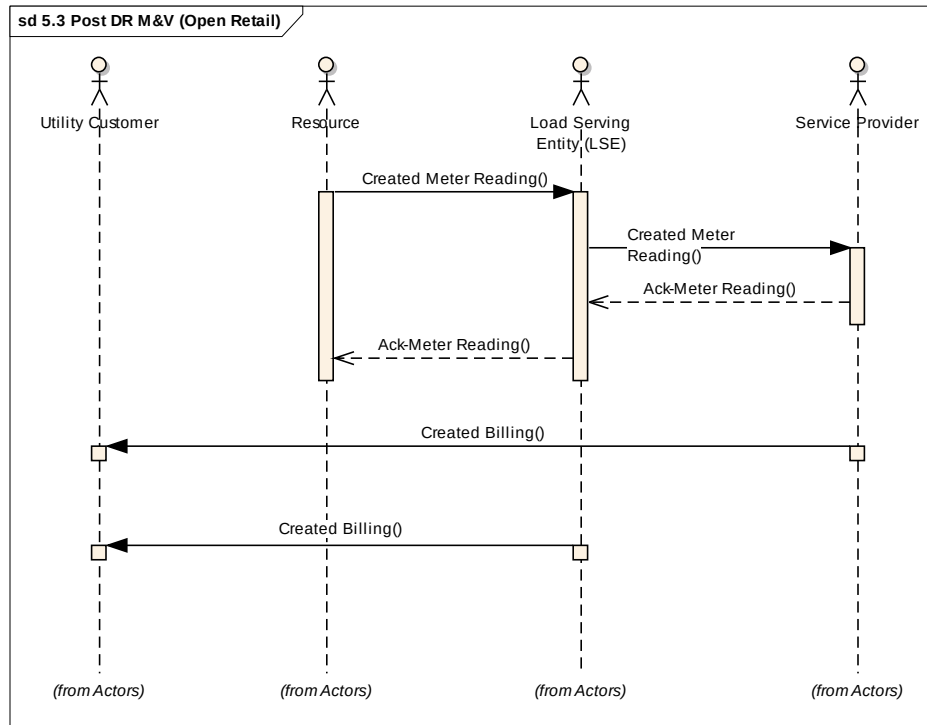
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REQ.17.3.1.4.132.15.2 Post DR Event M&V / Settlement (Open Retail)

REQ.17.3.2.15.2.1 Description

After DR Event has been completed, Measurement and Verification (M&V) can confirm action has been taken or to measure the impact of the response. After the M&V, the Financial Settlement is calculated and sent to the Electricity Retail Customer. This Use Case covers the scenarios with Open Retail Markets.

REQ.17.3.2.15.2.2 Sequence Diagram



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(Repeating the Appendix is redundant – refer to the Appendix in REQ.15. This also avoids the maintenance issue of havinf to update 3 different areas.)

REQ.17-A Appendix A – Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall information model for demand response. Figure 1A contains a data model used to illustrate the entity-relationships within the model. Abbreviations/Acronyms correspond to the IDs shown in the figure.

Proper (and Improper) Usage of the Entity-Relationship Model.— The entity-relationship model is used to show cardinality among objects in the model, for example every Resource belongs to one and only one Service Provider and a PremiseService Location contains one or more End DevicesService Delivery Points. The entity-relationship model does not provide use case information; actors are objects in the model and do not “act” in the model. The entity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the enrollment of those Resources may be managed by a System Operators or a Utility Distribution Operator. Both use cases and process maps are separate components of the Model Business Practices.

Reading Crow's Foot Notation.— Objects in the model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow's Foot notation, as documents in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a PremiseService Location is related to one-or-more End DevicesService Delivery Points (reading top to bottom) and every End DevicesService Delivery Point is related to exactly-one PremiseService Location (reading bottom to top).

Optional Objects.— The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.

Optional Objects.— The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the

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~~definition of Resources and Service Locations, but does not require Asset Groups and Assets.~~

~~**Applicability to Retail and Wholesale.** The entity relationship model is applicable to both wholesale and retail. When using the model for wholesale, the applicable business entities are 2.1 (System Operator) and 2.3 (Market Participant), while in retail markets, the parallel business entities are 2.3 (Utility Distribution Operator) and 2.4 (Utility Customers). Other than the swapping of the two pairs of terms, the models are identical, including the names of and relationships among objects.~~

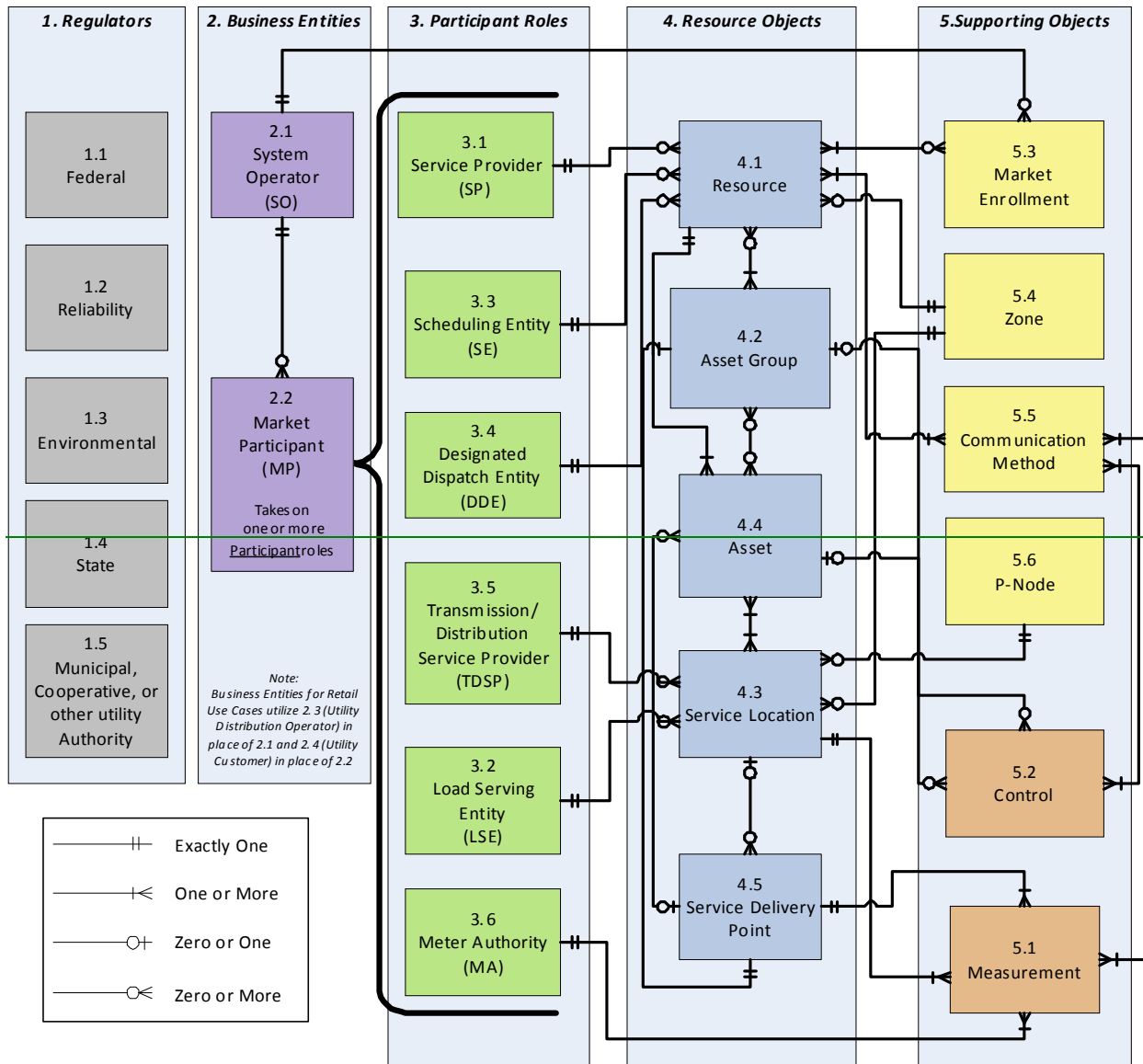
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Figure 1A. Entity-Relationship Model for Smart Grid Use Cases



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4. Supporting Documentation

a. Description of Request:

REQ Annual Plan Item 9(c) – “Develop Requirements and Use Cases for PAP 09 – Demand Response/Distributed Energy Resources”

b. Description of Recommendation:

This recommendation provides the data requirements related to the use cases developed as part of the phase one effort

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the development of standard DR and DER signals.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- March 11, 2010 Meeting Notes – To be posted
- March 18, 2010 Meeting Notes – To be posted
- March 25, 2010 Meeting Notes – To be posted
- April 1, 2010 Meeting Notes – To be posted
- April 8, 2010 Meeting Notes – To be posted
- April 29, 2010 Meeting Notes – To be posted
- May 13, 2010 Meeting Notes – To be posted
- May 20, 2010 Meeting Notes – To be posted
- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes – To be posted
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc

BGE Comments



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Requesters:	Smart Grid Interoperability Panel
Request No.:	2010 Retail Annual Plan Item 9(c)
Request Title:	Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc
- September 9, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes – To be posted

C#	Company	Category	Cite
1	Trane - Ingersoll Rand (Sharon Dinges)	Technical	REQ.17.3.1.4.3.2
2	Trane - Ingersoll Rand (Sharon Dinges)	Technical	REQ.17.3.1.4.7.1 Event Modification Number

Suggested Change

"Response Time" - framed with respect to DR. However, couldn't this also be viewed in terms of being used for DER?

Suggest modifying to: "this number is incremented **by one**." It may seem to be blatantly obvious but, in Industry Standards that have "implied" the by one... there have been implementers who did not think it was all that obvious. Easier to remove any ambiguity from the outset.



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1. RECOMMENDED ACTION:

☒ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The business process flows, use cases and data ~~requirements~~ elements presented in this document illustrate the standard interactions between Utility Distribution Operator, Service Provider (Demand Response) and Utility Customer for the administration and deployment of demand response resources retail markets.

RECOMMENDED STANDARDS:

In response to NIST's Priority Action Plan 9, this document provides ~~elements~~ requirements specifications, in the form of business process flows, use cases and data ~~elements~~ requirements in certain areas, to support the standardization of the information exchange between Utility Distribution Operator, Service Provider (Demand Response) and Utility Customer. This document shares a standard set of actors and terminologies with the companion Requirements Specification for Wholesale Standard DR Signals.



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REQ.17.2.B

New REQ.17.2.B Defined Terms to be added to REQ.17 are included in the Recommendation Request Titled Phase Two ~~Requirements~~ Specifications for Common Electricity Product and Pricing Definition – for NIST PAP03 to avoid redundancy between recommendations.

RECOMMENDED STANDARDS:

Executive Summary

Specifications for Retail Standard Demand Response Signals

The North America Energy Standards Board (NAESB) Smart Grid Standards Subcommittee took the responsibility of consolidating and developing DR use cases that provide ~~requirements~~ specifications for developing DR control and pricing signal standards, which is called for by National Institute of Standards and Technology (NIST) Priority Action Plans (PAP) 03 and 09. This document addresses the business and data ~~requirements~~ specifications for standardizing control and pricing signals for Retail level Demand Response (DR) and Distributed Energy Resources (DER) as part of the Smart Grid implementation. Wholesale market DR and DER information exchanges are outside the scope of this document and are addressed in the ~~Requirements~~ Specifications for Wholesale DR signals. The first step of use case development is the development of the Framework for Integrated DR and DER Models document, which provides an overall business context for DR and DER Models.

According to the Framework Document findings:

1. DR signals standardization ~~must~~ should support all four market types; i.e. regions with a) no open wholesale and no retail competition, b) open wholesale market only, c) open retail competition only, d) open wholesale and open retail competition. It must also consider key differences that exist and will continue to exist in all four market types.
2. Wholesale market DR and pricing signals have different characteristics than retail market DR and pricing signals, although commonality in format is feasible.
3. Most Customers (with a few exception of Commercial and Industrial (C&I) Customers) will not interact directly with wholesale market when it comes to DR and pricing signals.
4. Retail pricing models are complex, due to the numerous tariff rate structures that exist in both regulated and un-regulated markets. Attempts to standardize DR control and pricing signals must not hinder regulatory changes or market innovations when it comes to future tariff or pricing models.
5. New business entities (Energy Service Providers (ESP), Demand Response Providers (DRP), Service Providers, and Energy Information Service Providers (ESIP)) as well as new customer energy management systems ~~will~~ may play an increasing role in DR implementation.
6. DER may play an increasingly important role in DR, yet the development of tariff and/or pricing models that support DER's role in DR is still in its infancy.



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7. The Customer's perspective and ability to react to DR control and pricing signals ~~must~~should be a key driver during the development of DR standards.

The following deals exclusively with the retail level demand response signals ~~requirements~~specifications. The ~~requirements~~specifications are captured in the form of UML models, where business ~~requirements~~specifications are captured in Use Case narrative format, data ~~requirements~~specifications are captured in tabular format, and information exchange flows are captured in sequence diagram format. The top level use cases for retail DR are:

1. Administrate DR Program
2. Administrate Customer for DR
3. Administrate DR Resource
4. Execute DR Event
5. Post DR Event Management

Introduction

Specifications for Retail Standard Demand Response Signals

This Model Business Practice and data elements included herein are not intended to (i) require the use of any of these data elements, (ii) require the provision or purchase of any products, programs, rates, markets or services, or (iii) supersede~~replace~~ applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this Model Business Practice.

Purpose: The purpose of the following is to capture business and data ~~requirements~~specifications for Retail Level DR signals between entities that control and manage the DR programs and entities that provide demand response with DR resources and assets. This is to fulfill the NAESB SGTF responsibility under the NIST Smart Grid Interoperability Standards development PAP09. This requirements document will then be used by other standards development organizations identified by NIST PAP09 for further development of DR signals technical specifications for both C&I customer and residential customer markets.

Scope: The scope of the following is to provide business and data ~~requirements~~specifications for standardizing Demand Response signals at the retail (distribution) level.

Commentary on Distributed Energy Resources: In the context of this report, Distributed Energy Resources (DER) are dispatchable energy generation and storage technologies, typically up to ten MWs in size, that are interconnected to the distribution grid to provide electric capacity and/or energy to a customer or a group of customers and potentially export the excess to the grid for economical purposes. DER systems can generate electric power, as opposed to curtailable or interruptible loads that can just reduce electric loading on the grid.

DER may be subdivided into distributed generation (DG), distributed storage, and plug-in electric vehicles (PEVs):



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Distributed generation (DG) technologies can be divided into a) **Renewable Generation**, e.g., small wind power systems, solar photovoltaic (PV), Fuel Cells, Bio-fuel generators and Digesters, nuclear, hydro and other generation resources using renewable fuel, and b) **Non-Renewable Generation**, e.g., micro-turbines, small combustion turbines, diesel, natural gas and dual-fueled engines, etc.

Storage resources could be divided into a) **Electric Storage**, e.g., battery systems and uninterruptible power supplies (UPS), flywheel, superconducting magnetic energy storage (SMES), etc. and b) **Thermal Storage** – These convert electric power to thermal (cooling/heating) energy for later use, e.g., Ice-based air cooling system, and high-capacity brick-based air heating system.

Plug-in electric and hybrid vehicles (PEV/PHEV) may also be considered as DER. The electric vehicles may be used to supply stored electric energy back to the grid, a.k.a. Vehicle-to-grid (V2G).

Behind-the-meter DER may be bundled with regular load and managed alongside the demand response resources – such as a residential roof-top PV solar panel. But often, DER is treated separately in part due to its control capabilities. In addition to a regular retail tariff, behind-the-meter DER may be subject to net-metering or feed-in tariff, where excess generation can be exported to the grid at an established or a dynamic price.

Similar to DR resources, DER assets need to be registered and enrolled into a DR program. Furthermore, DER assets are typically required to meet additional technical requirements and certification for grid interconnection. Depending on the size of a DER and its export capabilities, sub-metering and telemetry capabilities may be required to monitor the impact of the DER operation on the distribution grid reliability and power quality. Also, renewable resources may receive Renewable Energy Credits (RECs) and may also qualify as a must-run resource, e.g., wind power in some regions. These need to be incorporated into pricing and control signals associated with DER operation.



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Model Business Practices

REQ.17.3.1 Specifications for Retail Standard Demand Response Signals

The following describes general business processes for implementing demand response capacities at the retail market level. The following principles apply to the development and application of these business ~~practices~~[process requirements](#).

#	Name	Description	Rationale	Implication
1	Scalability	The architecture should allow for the management of millions of Customer premises devices	Scale-out, adding more low-cost machines, has proven to be superior to scale-up, using larger single machines, as a way to handle large loads. For example, high traffic web sites use farms of low-cost machines to serve pages to millions of simultaneous web users.	Architecture should allow the solution to scale-out as more devices are added.
2	Actionable, testable, and transferable work products	Any work (artifacts) that are created can be used by the audience for this work, e.g., utilities, vendors, regulators, etc. There needs to be clear, explicit guidance for how to use the artifacts. There is an expectation that the work products are useful at lower levels of design.	Such work products will promote market adoption and minimize the cost and risk of adoption, leverage open and best practices, and establish repeatable processes, patterns, and templates for all work products.	The use of common tools and methods will be fostered. Organizations that do not follow the use of the common tools and methods may have more difficulty implementing the artifacts.



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#	Name	Description	Rationale	Implication
3	Platform Independence, Vendor Neutral	Requirements and design artifacts ~~shall~~ <u>should</u> be platform independent. Implementation technology shall be chosen due to its level of acceptance at the marketplace as open standards.	There is an expectation of differentiation and innovation in the marketplace. With greater dependence on a specific platform, there may be less architectural flexibility.	To achieve both technical and semantic interoperability, certain lower level technologies will need to be chosen. For example, Web Services technology is widely used for integration, and UML is widely used for modeling.
4	Cyber Secure	Architecture ~~must~~ <u>should</u> incorporate latest secure computing techniques.	The integrity of the electric grid and market depend on preventing unauthorized actors from manipulating the DR and DER system.	Architecture ~~must~~ <u>should</u> comply with the latest security guidance from the NIST SGIP Architecture Committee and CyberSecurity Task Group, when it comes to Web Services security related implementation.
5	Interoperability	DR signaling standards should utilize open, interoperable industry standard control and communication technologies to integrate with both common energy management and control systems that can conduct DR activities	Interoperability across different domains of Smart Grid is key to the success of DR signaling standards ~~as it ensures level playing field for innovative solutions for all participants of the Smart Grid.~~	DR signaling standards ~~must~~ <u>should</u> be developed in harmonization with others relevant standards as identified by the NIST SGIP.



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#	Name	Description	Rationale	Implication
6	Automatic Demand Response	The DR program (analysis, notification, event, action, monitoring, verification, settlement) should be automatic. DR signaling standards should provide secure, reliable communications with consumers for DR operations	Automation ~~is the only way to help~~ ensure large scale and repeatable demand response implementation.	Security, reliability and testability ~~must~~ should be ensured for DR automation.
7	Cover All Market Types	DR signaling standards should be supported and implementable in all four market types listed in this document	Standards development ~~shall~~ should not get in the way of regulatory policy decisions.	DR signals design need to support a wide range of programs and tariff/pricing structures.

REQ.17.3.1.1 Conventions

The use case modeling technique is used for capturing business and data requirements relative to Retail Demand Response. There are two basic diagrams used in this document. The first one is the use case diagram, which shows the scope of business use cases for a given business scenario. The relationships used in the Use Case diagrams are as follows:

- Include: this indicates additional scenarios
- Extend: this indicates alternatives scenarios
- Generalization (line with triangle head): this indicates variations (sub-types) of the main use case.
- Precedes: this indicates a time sequence
- Invokes: this indicates a pre-condition or dependency

The second is the sequence diagram, which shows the information exchange flows between actors for a given use case. The message flows are shown in one way with the convention of verb and noun, verb indicating the action being taken, noun indicating the name of the information being exchanged. The return message flow is the acknowledgement of the main message flow.

REQ.17.3.1.2 ACTORS

The actors listed in the table below are specific to this Model Business Practice and are a subset of the actors and related objects defined in WEQ-000. Details on the relationships between the actors and related objects are further defined in Appendix A.



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Table 1 - Actor Roles

Term	Actor ID ¹
Communication Method	5.5
Control	5.2
Designated Dispatch Entity	3.4
Designated Dispatch Entity (DDE)	3.4
End Device (ED)	4.5
Enrollment	5.3
Environmental Authority (EA)	1.3
Federal Regulator (FR)	1.1
Load Serving Entity	3.2
Load Serving Entity (LSE)	3.2
Local Authority (LA)	1.5
Market Participant (MP)	2.2

¹ The Actor ID shown in the table refers to the item number of the corresponding actor or related object in the Entity-Relationship Diagram provided in Appendix A. Definitions of the actors and related objects are included in REQ.17.2



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Term	Actor ID ¹
Measurement	5.1
Metering Authority	3.6
Metering Authority (MA)	3.6
P-Node	5.6
Service Location	4.3
Reliability Authority (RA)	1.2
Resource	4.1
Scheduling Entity	3.3
Scheduling Entity (SE)	3.3
Service Provider	3.1
~~Service Provider (SP)~~	~~3.1~~
State Regulator (SR)	1.4



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Term	Actor ID ¹
System Operator	2.1
~~Transmission/Distribution Service Provider~~	~~3.5~~
Transmission/Distribution Service Provider (TDSP)	3.5
Utility Customer (UC)	2.4
Utility Distribution Operator (UDO)	2.3
Zone	5.4

REQ.17.3.1.3 Use Case Overview

Similar to the Wholesale Demand Response use cases, Retail Demand Response use cases generally follow five main steps, see the Figure 1².

1. Administrate DR Program
2. Administrate Customer for DR
3. Administrate DR Resource
4. Execute DR Event
5. Post DR Event Management

There are many programs that exist in today's retail markets with or without open competition. New programs will be defined and deployed in the future. The goal of this use case analysis is to find commonalities among these

² DR program administration related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from the final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the customer enrollment and DR program administration related business practices.



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programs so that the derived DR signal messaging specification can be implemented to support a large number of DR programs.

The focus of the Standardized DR Signals is the step 4, Execute DR Event, where the DR signals will be communicated between the DR Providers and the DR resources. All other use cases are supporting materials to ensure that DR use case requirements are documented and understood in a complete picture.

The use cases included in this document are not intended to be required or exhaustive and are provided for ~~clarification~~ informational purposes.

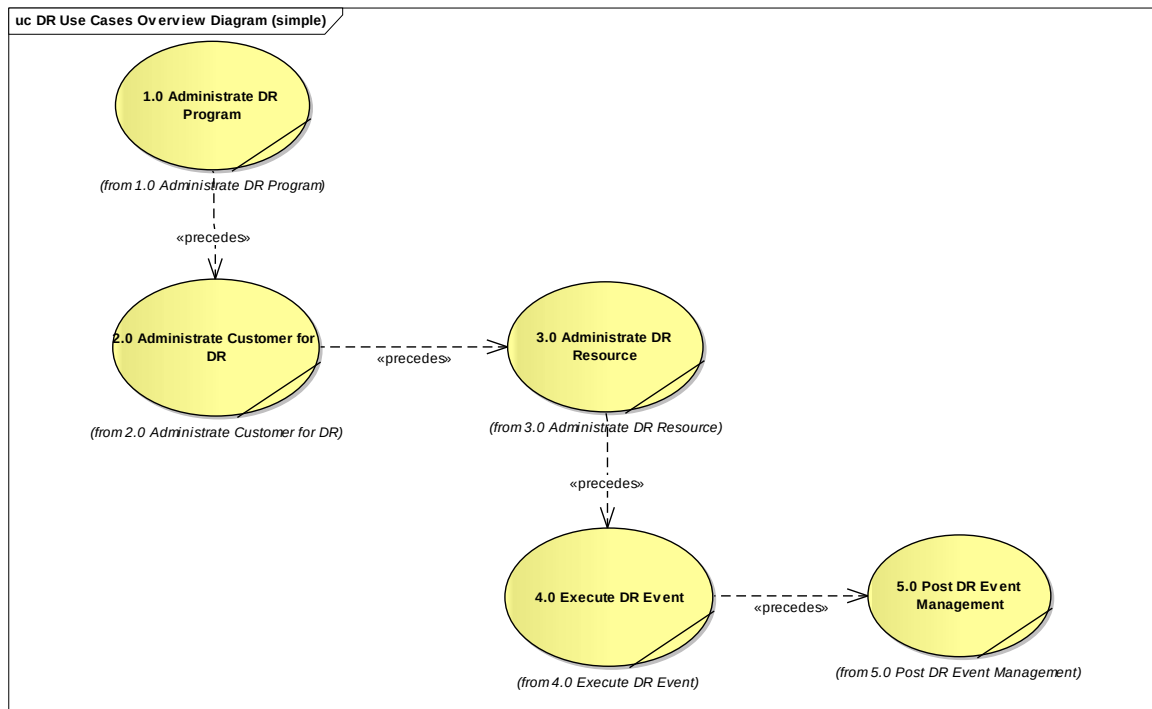


Figure 1. Retail Market DR Use Case Overview



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REQ.17.3.1.4 Specific Use Cases

REQ.17.3.1.4.1 Administrate DR Program

DR program administration related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from the final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the customer enrollment and DR program administration related business practices.

REQ.17.3.1.4.2 Administrate Customer for DR

DR program customer enrollment related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from the final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the customer enrollment and DR program administration related business practices.

REQ.17.3.1.4.3 Administrate DR Resource

DR Resource is an equivalent of Resource defined in the actor list table.

As part of enrolling customers to a DR program, specific DR resources and assets that are associated with customers' accounts and premises will also need to be registered. Figure 4 shows the actors and use cases involved in administrating DR resources and/or assets into DR programs. The following use cases deal with the registration, update, and removal of DR resources and assets associated with a customer. When updating DR resources, there will also be potential use cases of DR bidding process, either for supplying or for buying power. There are also cases where Distributed Energy Resources will act as DR assets.



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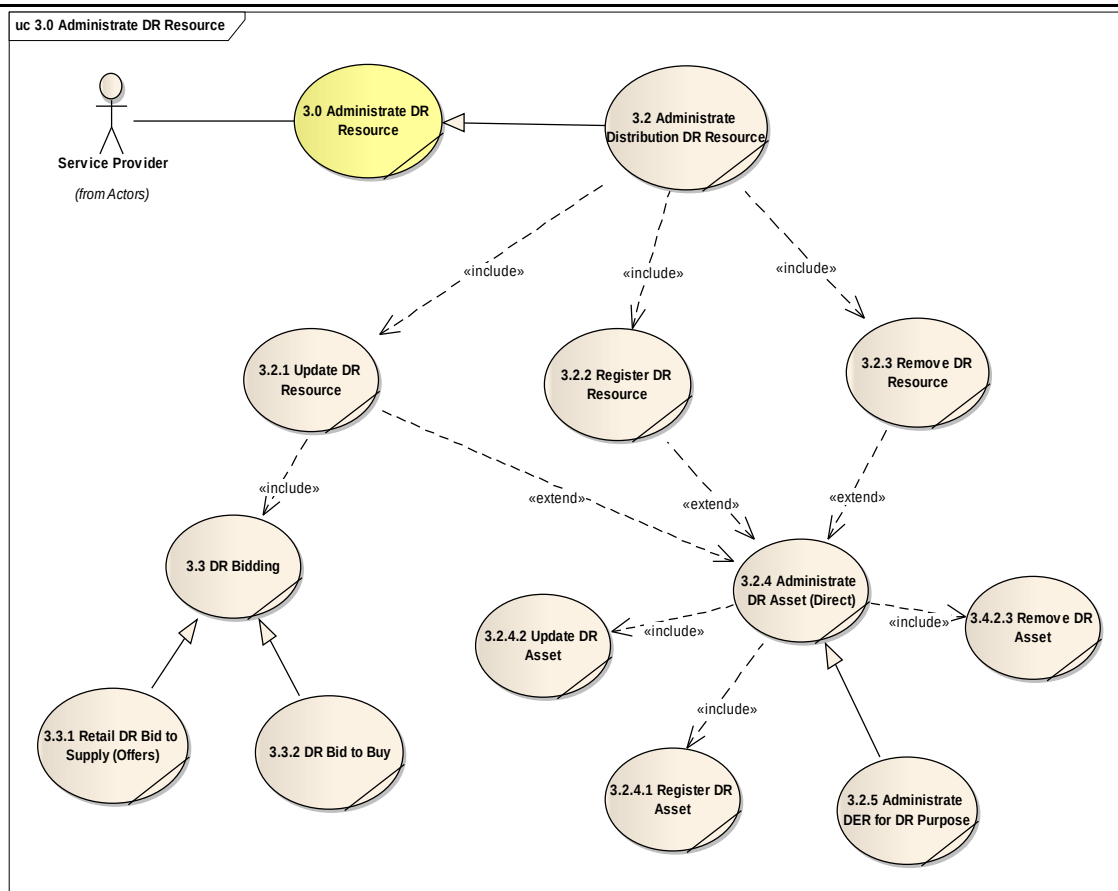


Figure 2. Administrate DR Resources and/or Assets into DR Programs

REQ.17.3.1.4.3.1 Administrate Distribution DR Resource

These activities are used to administer all of the DR Resources and Assets, including a variety of activities surrounding the registration of DR Resources and the management of information surrounding the DR Resources that a Service Provider may call upon during a DR event. Before a DR Resource may be called upon, it must be registered with the Service Provider. The administration of a DR Resource covers the following requirements:

- The need of the Service Provider to identify a DR Resource for communications purposes;
- The need of the Service Provider to establish DR Resource accounts for accounting purposes;
- The need of the Service Provider to collect information from DR Resources prior to DR events for the purposes of determining which DR Resources to call upon during a DR



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Event; and

- The need of the Service Provider to collect information from DR Resources prior to DR events for the purposes of determining the nature of the DR signals to send to the DR Resources.

REQ.17.3.1.4.3.2 Update DR Resource

Description

When the base capacity of a DR Resource changes from when it was last registered with the DR provider, customer needs to provide updated information to the DR provider so that such information can be factored into the consideration for DR event planning.

Data Requirements Elements

Attribute Name	Description
Resource ID	Identifier assigned to the Resource
Resource Type	Type of Resource. Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, and storage.
Transmission/Distribution Service Provider Account Number	Transmission/Distribution Service Provider's (Utility) account number for the Resource.
Demand Response Provider	The entity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response products.
DR Resource Group ID	Grouping of Resources that can respond to the same DR Signal.
Program Identifier	The identifier of the program
Constraint Type	Type of operational, schedule or offer constraint
Constraint Interval	The timeframe over which the constraint type applies.
Constraint Value	Value of the Constraint Type and Interval
Effective Enrollment Date	Effective Start Date for the Enrollment
Location	The location of a Resource defined by one or more of the following attributes:
Location Attributes	



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Attribute Name	Description
Service Location ID	Identifier assigned to the Service Location
Address1	Address line 1
Address2	Address line 2
City	City
State/Province	State or Province two-letter code
Zip/Postal Code	Zip or Postal Code
Country	Country
GPS Coordinates	~~Latitude~~ Latitude and longitude
Weather Station	Weather Station code associated with the Service Location
Zone ID	Identifier assigned to the Zone in which the Service Location is located
Zone	Name of the Zone in which the Service Location is located
Electrical Node ID	Identifier assigned to the Electrical Node at which the Service Location is connected
Electrical Node Name	Name of the Electrical Node at which the Service Location is connected
Electrical Node Type	Type of Electrical Node at which the Service Location is attached
PNode	Name of the Price Node associated with the Service Location
PNode ID	Identifier assigned to the Price Node associated with the Service Location
End of Location Attributes	
Response Time	The amount of time before an asset/resource is capable of meeting its full performance, in response to a request by a Service Provider to shed load.
Capacity Type	Type of Capacity
Capacity Type description	Description of the Type of Capacity
Nominal Capacity	Nominated load

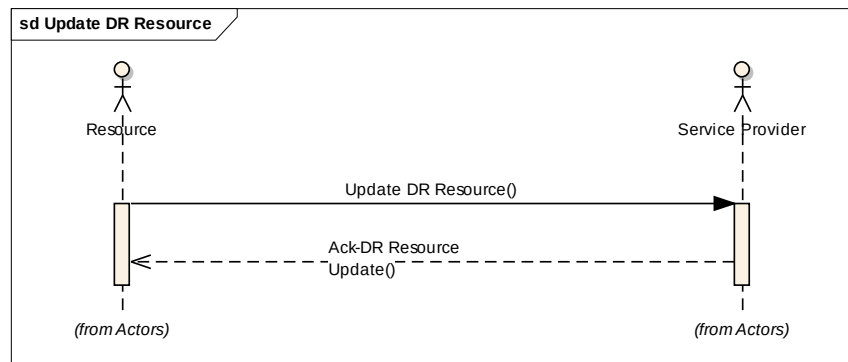


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Attribute Name	Description
Offer Commit Status.	Commitment status of offer Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc. Also referred to as "opt-in" or "opt-out" for existing Demand Response Programs.
Resource Type	Type of Resource Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.
Resource Qualification Test Date	Date the Resource demonstrated its ability to deliver a product or service
Requalification Test Date	Date the Resource will retest its ability to deliver a product or service
Enrollment End Date	Date of Termination of Enrollment
Enrollment Status	Status of the Enrollment for the Resource

Sequence Diagram



REQ.17.3.1.4.3.3 Register DR Resource

Description

A party with ownership, controlling interest, or administrative responsibilities for a DR Asset or DR Resource that communicates status-related operational information about the



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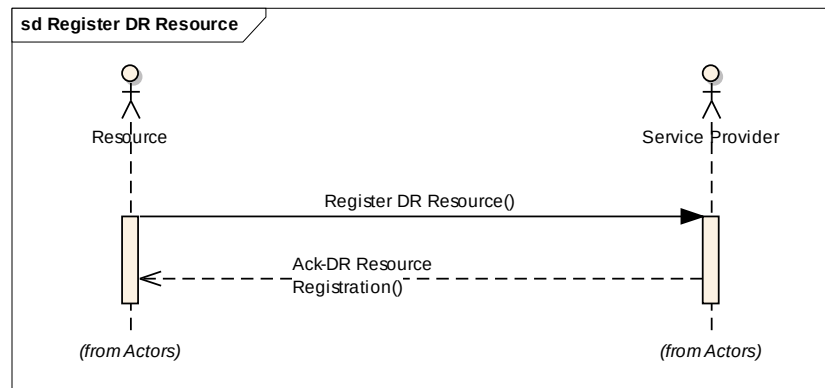
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DR Asset or DR Resource to a Service Provider. For example, the owner of a DR Resource or Asset may wish to declare their inability to shed load (an outage) due to summer shutdown or may wish to reduce the available capacity of a resource/asset due to equipment maintenance or other causes.

Data Requirements Elements

The Data Requirements Elements are the same for Register / Enroll DR Resource and Update DR Resource.

Sequence Diagram



REQ.17.3.1.4.3.4 Remove DR Resource

Description

When a DR resource is no longer available permanently for DR purpose, it needs to be removed from the DR program for that customer so that it will be accounted for DR event planning.

Data Requirements Elements

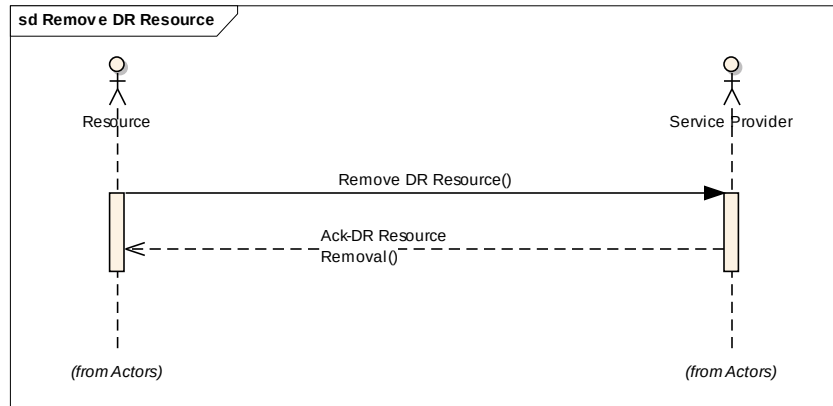
Attribute Name	Description
Resource ID	Identifier assigned to the Resource that is removed.
Program Identifier	The identifier of the program
Enrollment End Date	Date of Termination of Enrollment
Enrollment Status	Status of the Enrollment for the Resource (Set to 'REMOVE')



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Sequence Diagram





RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specifications for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.1.4.4 Administrate DR Asset (Direct)

REQ.17.3.1.4.4.1 Register DR Asset

Description

The DR Asset registration process must capture key identifiers to enable accurate tracking of DR assets and their capabilities. A requirement for a System and Market Operator, Load Serving Entity, Service Provider, or other entity facilitating the registration process (hereinafter referred to as DR Asset Administrator) is to track assets. This is done through DR asset registration and association of physical DR assets to DR Resources to recognize the asset and its potential contribution as part of a DR Resource. The DR Asset Administrator ultimately administers the DR Asset registration process to recognize DR Assets that can serve as part of a DR Resource, although the Customer may be party to the registration process.

Data Requirements Elements

Attribute Name	Description
Asset ID	The unique ~~identifier~~ identifier of the asset
Program Identifier	The identifier of the program
DR Asset Group ID	Grouping of Assets that can respond to the same DR Signal within a DR Resource. (See DR Resource Specification)
Asset Operator ID	The identifier of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.
Asset Operator Name	The name of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.
Asset Owner ID	The Identifier of the business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).
Asset Owner Name	The Name of business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).
Location	The location of a Resource defined by one or more attributes:
Service Location ID	Identifier assigned to the Service Location
Address1	Address line 1



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Attribute Name	Description
Address2	Address line 2
City	City
State/Province	State or Province two-letter code
Zip/Postal Code	Zip or Postal Code
Country	Country
GPS Coordinates	~~Latitude~~ <u>Latitude</u> and longitude
Weather Station	Weather Station code associated with the Service Location
Zone ID	Identifier assigned to the Zone in which the Service Location is located
Zone	Name of the Zone in which the Service Location is located
Electrical Node ID	Identifier assigned to the Electrical Node at which the Service Location is connected
Electrical Node Name	Name of the Electrical Node at which the Service Location is connected
Electrical Node Type	Type of Electrical Node at which the Service Location is attached
PNode	Name of the Price Node associated with the Service Location
PNode ID	Identifier assigned to the Price Node associated with the Service Location
Effective Enrollment Date	Effective Start Date for the Enrollment (Registration)
Enrollment Status	Status of the Enrollment for the Asset
Offer Commit Status	Commitment status of offer Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc. Also referred to as "opt-in" or "opt-out" for existing Demand Response Programs.
DR Asset Physical Capabilities	Asset Capabilities include Ramp Rates and Capacity.
Ramp Rate Value	Ramp Rate associated with the selected Ramp Rate Type for the selected Ramp Rate Segment and Ramp Rate Direction
Capacity Type	Type of Capacity

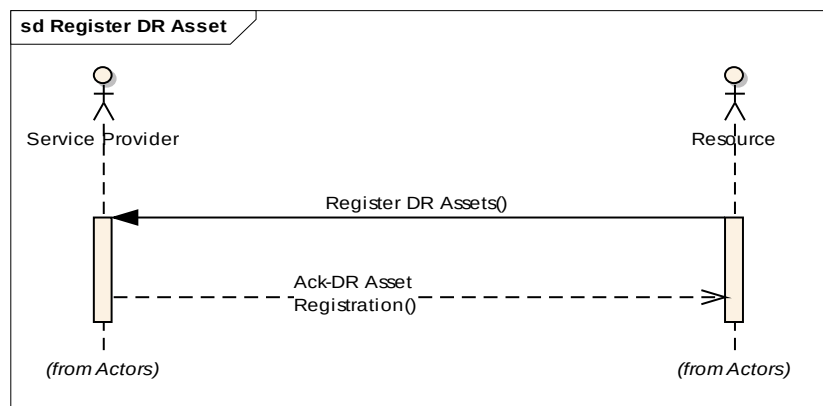


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Attribute Name	Description
Capacity Type description	Description of the Type of Capacity
Nominal Capacity	Nominated load
Asset Manufacturer	Manufacturer of the Asset
Asset Model	Model Identifier of the Asset assigned by the Manufacturer
Asset Version	Model Version Identifier assigned by the Manufacturer.
Asset Manufacture Date	Date of Manufacture of the Asset
Asset Type	Type of Asset. Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.
DR Resources	The identifier of DR resources that the DR Assets belong to. An Asset can associate with multiple Resources, but with only one Resource for a DR Program.

Sequence Diagram





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REQ.17.3.1.4.4.2 Update DR Asset

Description

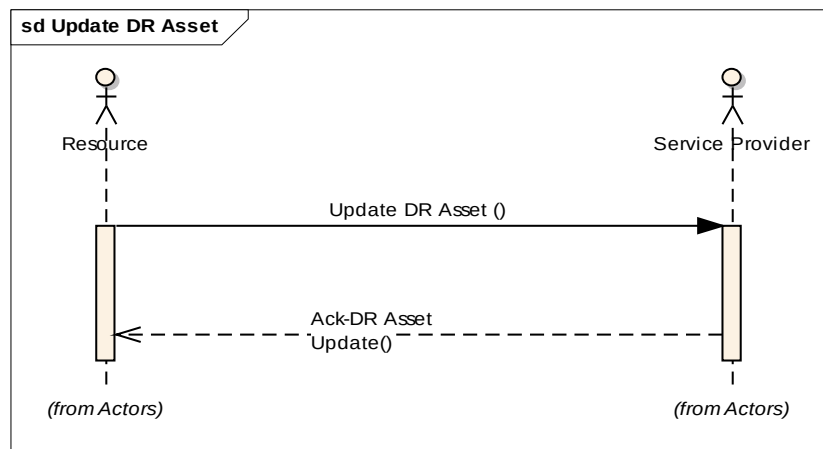
Once a DR asset registration is completed, changes to elements of the registration may be required or desired. After identifying the specific required modification and verifying the authorization to perform the update, each of the considerations identified in the DR Asset registration step should be evaluated and utilized, where necessary, during the update of the DR Asset information. The ability to update DR Asset information helps to ensure the asset information on record is current and complete.

Parties that are privy to and rely on the update should be notified of updates as soon as practicable after they are made. Additionally, these parties should have access to review and, in some cases, to approve/disapprove the update(s).

Data RequirementsElements

The Data RequirementsElements are the same for Register / Enroll DR Asset and Update DR Asset.

Sequence Diagram





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REQ.17.3.1.4.4.3 Remove DR Asset

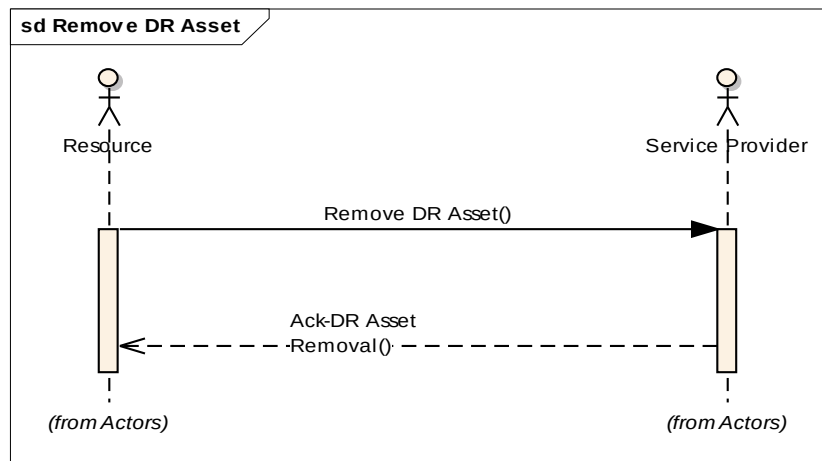
Description

Removing a DR Asset must take into account any DR Resource long term commitments in System Operator programs and contractual obligations with Service Providers or Load Serving Entities. In addition, applicable regulatory agency filings and approvals must be considered prior to removing a DR Asset from a DR program.

Data Requirements Elements

Attribute Name	Description
Asset ID	The unique <u>identifier</u> of the asset
Program Identifier	The identifier of the program
Enrollment End Date	Date of Termination of Enrollment
Enrollment Status	Status of the Enrollment for the Asset ('REMOVE')

Sequence Diagram





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REQ.17.3.1.4.5 DR Bidding

Description

Demand Response Bidding occurs after the DR Assets and Resources that are to comprise the desired bid have been registered and a bid or an offer is to be formed. The DR Bidding use case has two sub-use cases, depending on the type of bid to be developed for submission: a bid to supply (i.e., an offer), or a bid to buy. The entity operating the DR bidding program (the Bid Receiver) receives bids from participants (the Bidders). The Bidder may be a Customer bidding with either an energy retailer (e.g., LSE, ESP), a Service Provider (e.g., CSP, DRP), or a power marketer (i.e., wholesale market participant). The Bidder may also be a Service Provider bidding up to a LSE or power marketer.

Before the start of the bidding process, it is assumed that DR Resources available for selection are already registered to provide the physical resource participating in the DR Bidding program. It is also assumed that the bidder has already registered to bid with the bid receiver and has been informed on the appropriate timing and parameters for bid participation. The DR bidding process starts with the decision of the Bidder to develop a bid for submission. The Bidder submits its bid to the Bid Receiver within the appropriate time window and following set guidelines for bidding. The Bidder receives information on the outcome of the submitted bid from the Bid Receiver, who notifies of the bid outcome (e.g., a resource award or other DR commitment).

Examples of retail DR Bidding programs include:

- Demand Bidding
- Capacity Bidding

REQ.17.3.1.4.5.1 DR Bid to Supply (Retail Offers)

Description

The Bid Receiver opens the forum/venue for receiving an offer. (This may include initiating the bidding process by sending initial information to Bidders indicating parameters of acceptability for bids to be made). The Bidder communicates an offer to supply a specified product/service and the pricing or other incentive structure the bidder is willing to accept for DR. (This may be as simple as the customer sending a response back to the Bid Receiver that accepts or rejects the initial bid sought, or may involve more complex bid structuring).



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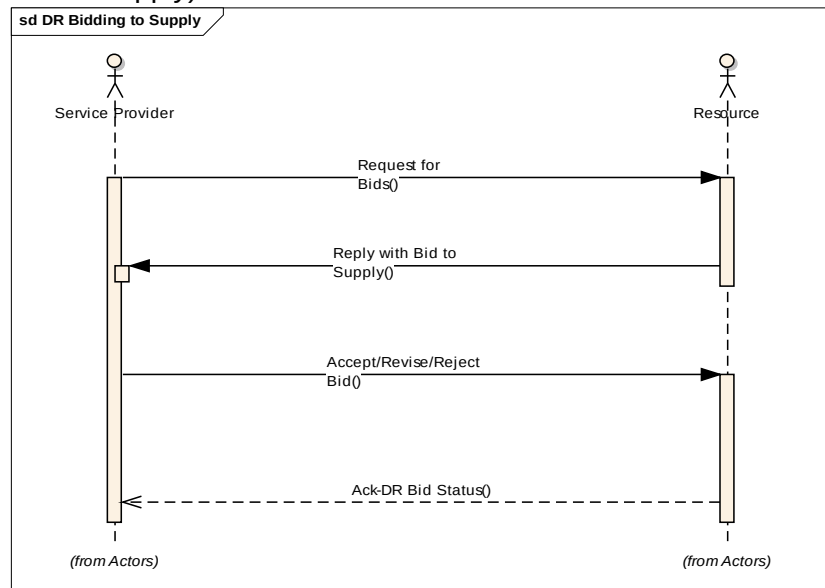
Each offer will have a clearly specified product or service that is being bid and the pricing/incentive structure being offered. The bidder also nominates the amount of and nature of supply being offered, the DR Resource to physically provide the service, and other physical parameters affecting resource availability and capability, in addition to the identity (or ID) of the bidder and resource(s) that comprise the bid.

The Bid Receiver reviews bids (offers) received and clears them, notifying the bidders of the outcome.

The Bidder receives the notification of awards or resource commitments and uses the information internally in preparation for DR Resource Dispatch.

Sequence Diagram

(Note, the Bid in the ~~following~~ following sequence diagram is an offer to supply)





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REQ.17.3.1.4.5.2 DR Bid to Buy

Description

The Bid Receiver opens the forum/venue for receiving a bid. (This may include initiating the bidding process by sending initial information to Bidders indicating parameters of acceptability for bids to be made). The Bidder communicates a bid to buy a specified product/service and the pricing or other incentive structure the bidder is willing to pay to avoid DR. (This may be as simple as the customer sending a response back to the Bid Receiver that accepts or rejects the initial bid sought, or may involve more complex bid structuring).

Each bid will have a clearly specified product or service that is being bid for purchase and the corresponding pricing structure that is acceptable to the Bidder. The Bidder also includes the quantity of product/service in the bid to buy, and specifies any DR Resource(s) that can physically substitute for the product/service in the event the bid to buy is not cleared (i.e., the bidder is unwilling to pay more than the going/market outcome price for the product/service). Other information submitted include physical parameters affecting resource availability and capability, in addition to the identity (or ID) of the bidder and resource(s) that comprise the bid.

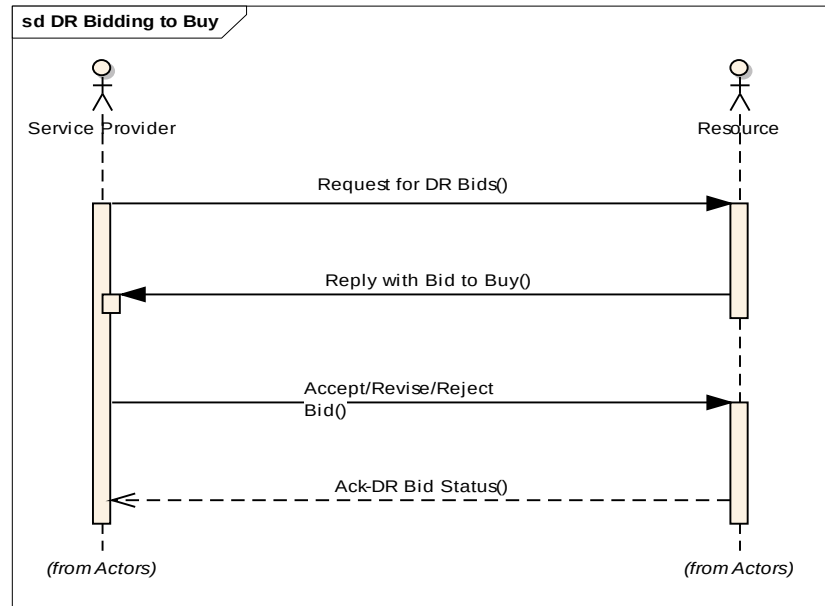
The Bid Receiver reviews bids received and clears all bids, notifying the bidders of the outcome. The Bidder receives the notification of resource commitments and uses the information internally in preparation for DR Resource Dispatch.



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Sequence Diagram





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REQ.17.3.1.4.6 Execute DR Event

The execution of a DR event takes different forms depending on operational situation and the type of DR programs being executed. Typically, they fall into one of the following four use cases, see Figure 5:

1. Advanced DR Notification
2. Broadcast DR Message (price plus information)
3. DR dispatch instruction
4. DR direct load control.

Operational considerations for DR event execution are also associated with DR programs where direct load control or dispatching instructions are carried out.

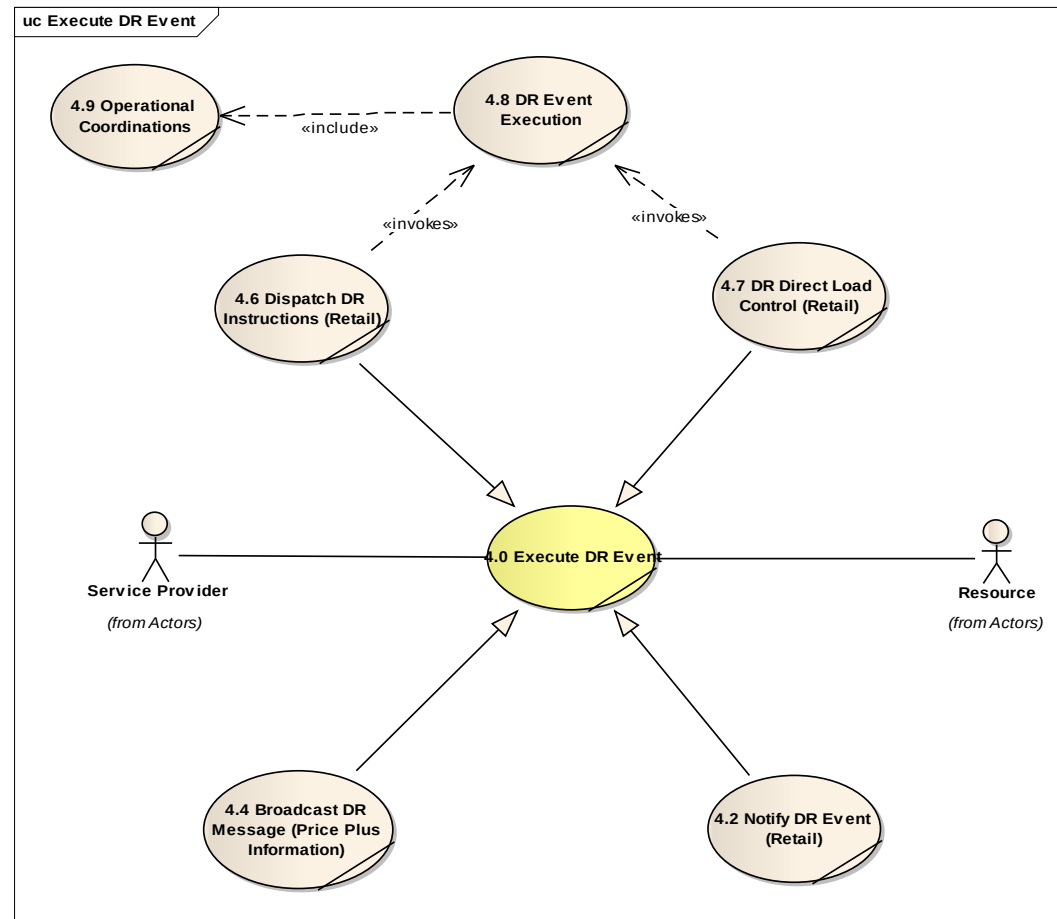


Figure 5. Execute DR Events



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REQ.17.3.1.4.7 Notify DR Event (Retail)

REQ.17.3.1.4.7.1 Advanced Notification for DR (Retail)

Description

This is used by the Service Provider to send the DR Event notification (i.e., DR signal) to the DR Resource.

The Notify DR Event Message applies to one of three types:

Broadcast DR Message (Price Plus Information)
Dispatch DR Instructions for Objectives (Retail)
DR Direct Load Control (Retail).

The message content specific to each of these types is defined in their respective sections below.

Data ~~Requirements~~ Elements

The following are the data ~~requirements~~ elements that are common to all of the Event Message Types.

Attribute Name	Description
Program ID	Program Identifier
Program Name	Name of the Program
Service Provider ID	Identifier assigned to the Service Provider
Event ID	Identifier assigned to the Event
Event Modification Number	A modification number for the DR event. This is used to indicate if the DR Event has been modified by the Utility. Each time it is modified, this number is incremented.
Area of Event Notice Applicability: The area affected by the Demand Response Event can be defined by a Location attribute (point location or area) or is applicable to a Resource or to an Asset for Direct Load Control.	
Resource ID	Identifier assigned to the Resource
Asset ID	The unique identifier of the asset
Location can be identified by any of the following:	
Service Location ID	Identifier assigned to the Service Location
Address1	Address line 1
Address2	Address line 2
City	City
State/Province	State or Province two-letter code
Zip/Postal	Zip or Postal Code



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Attribute Name	Description
Code	
Country	Country
GPS Coordinates	~~Latitude~~ <u>Latitude</u> and longitude
Weather Station	Weather Station code associated with the Service Location
Zone ID	Identifier assigned to the Zone in which the Service Location is located
Zone	Name of the Zone in which the Service Location is located
Electrical Node ID	Identifier assigned to the Electrical Node at which the Service Location is connected
Electrical Node Name	Name of the Electrical Node at which the Service Location is connected
Electrical Node Type	Type of Electrical Node at which the Service Location is attached
PNode	Name of the Price Node associated with the Service Location
PNode ID	Identifier assigned to the Price Node associated with the Service Location
The following are other attributes applicable to all DR Event Messages.	
Deployment Type	Type of Deployment. Examples are: Advanced (Normal), Immediate, Audit/Test.
Simple Signal Levels	Used as an alternate and simplified representation of the DR signal, whether it be price based or a dispatch. Takes on a small number of finite levels such as NORMAL, MODERATE, and HIGH, SPECIAL



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Attribute Name	Description																																				
Criticality Level	This field defines the level of criticality of this event. The action taken by load control devices for an event can be solely based on this value, or combination with other Load Control Event fields supported by this device. For example, additional fields such as Average Load Adjustment Percentage, Duty Cycle, Cooling Temperature Offset, Heating Temperature Offset, Cooling Temperature Set Point or Heating Temperature Set Point can be used in combination with the Criticality level. <table><tr><th>Criticality Level</th><th>Level Description</th><th>Participation</th></tr><tr><td>0</td><td>Reserved</td><td></td></tr><tr><td>1</td><td>Green</td><td>Voluntary</td></tr><tr><td>2</td><td>1</td><td>Voluntary</td></tr><tr><td>3</td><td>2</td><td>Voluntary</td></tr><tr><td>4</td><td>3</td><td>Voluntary</td></tr><tr><td>5</td><td>4</td><td>Voluntary</td></tr><tr><td>6</td><td>5</td><td>Voluntary</td></tr><tr><td>7</td><td>Emergency</td><td>Mandatory</td></tr><tr><td>8</td><td>Planned Outage</td><td>Mandatory</td></tr><tr><td>9</td><td>Service Disconnect</td><td>Mandatory</td></tr><tr><td>0x0A to 0x0F</td><td>Utility Defined</td><td>Utility Defined ³</td></tr></table>	Criticality Level	Level Description	Participation	0	Reserved		1	Green	Voluntary	2	1	Voluntary	3	2	Voluntary	4	3	Voluntary	5	4	Voluntary	6	5	Voluntary	7	Emergency	Mandatory	8	Planned Outage	Mandatory	9	Service Disconnect	Mandatory	0x0A to 0x0F	Utility Defined	Utility Defined ³
Criticality Level	Level Description	Participation																																			
0	Reserved																																				
1	Green	Voluntary																																			
2	1	Voluntary																																			
3	2	Voluntary																																			
4	3	Voluntary																																			
5	4	Voluntary																																			
6	5	Voluntary																																			
7	Emergency	Mandatory																																			
8	Planned Outage	Mandatory																																			
9	Service Disconnect	Mandatory																																			
0x0A to 0x0F	Utility Defined	Utility Defined ³																																			
Baseline Dates	Dates of days used to calculate the Energy Baseline																																				
Baseline Exclusion Dates	Dates of days Excluded from the calculation of the Energy Baseline																																				
Energy Baseline Value	Calculated Energy Baseline																																				
Energy Baseline Timestamp	Timestamp of Energy Baseline																																				
Deployment Period (Interval): The deployment period that is communicated to a Resource or Asset is an interval contained within the Start or End Time of the Event, but not necessarily for the entire Event.																																					
Event Start Time	Time of Start of deployment period for Event																																				
Event End Time	Time of End of deployment period																																				

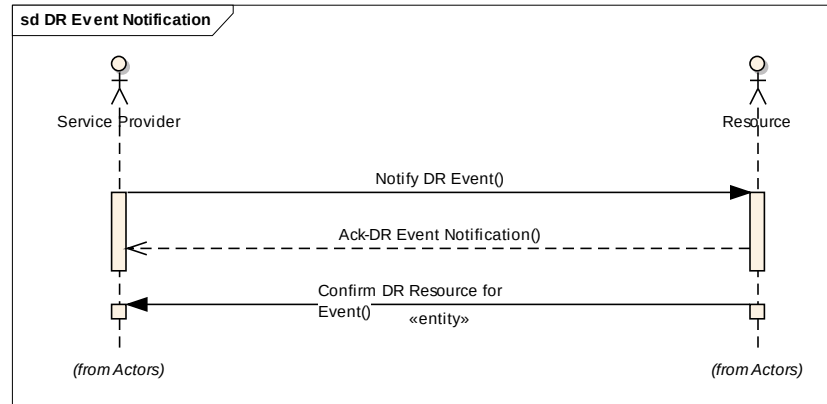
³ Requirement as defined by the ZigBee Smart Energy Profile™ 2.0 Technical Requirements Document



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Sequence Diagram





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REQ.17.3.1.4.7.2 Update a DR Event (Retail)

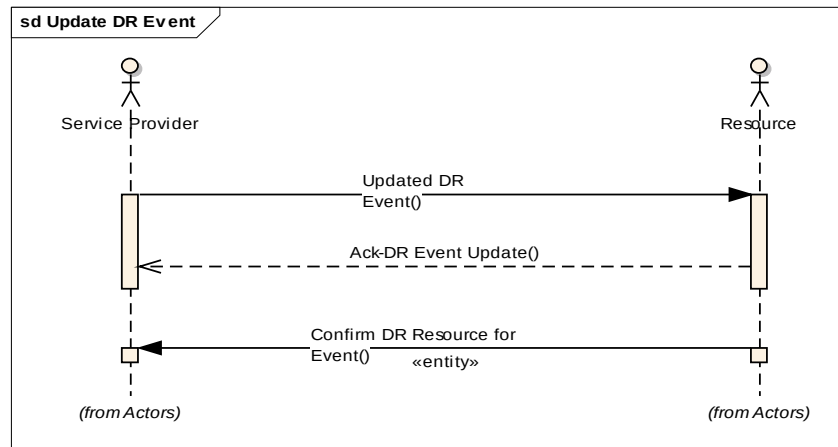
Description

This is used to update a DR event that has been previously notified. The requirements for this use case are the same as those for the "Advanced Notification for DR" use case.

Data Requirements Elements

Attribute Name	Description
Event	See the "Advanced Notification for DR" use case.
Event Modification Number	This is Modification number of the DR event. It is used to indicate that the DR Event has been modified by the Utility or Service Provider. Each time a DR Event is modified, this number is incremented.
Modification reason code	The reason the event was modified.

Sequence Diagram





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REQ.17.3.1.4.7.3 Cancel a DR Event (Retail)

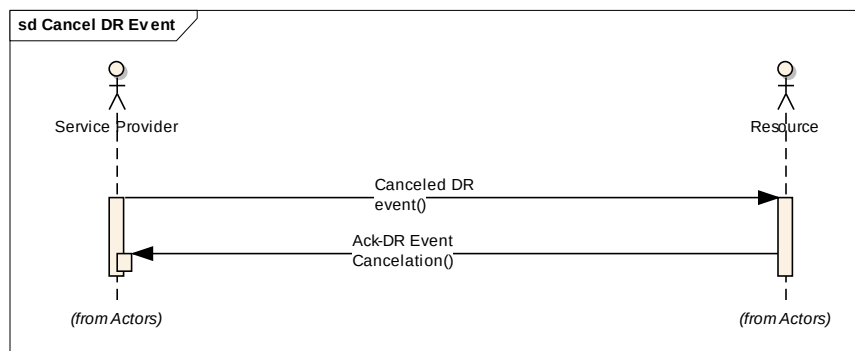
Description

This is used by the Service Provider to notify the DR Resource that a DR Event is being cancelled. It should only be executed if a DR Resource has previously received notification of a DR Event and that event has subsequently been cancelled.

Data RequirementsElements

Attribute Name	Description
Modification reason code	The reason the event is being cancelled.
Event Status	Status of the Event
DR Event Identifier	An identifier for the event that is being cancelled.
Effective date/time	The date and time a cancellation takes effect.

Sequence Diagram





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REQ.17.3.1.4.7.4 DR Resource Confirmation (Retail)

Description

This is a confirmation message that is sent by a DR Resource to the Service Provider as a result of receiving a DR Signal from the Service Provider. It may be used as an acknowledgement of the receipt of the DR signal, but it may also contain various information used to signify how the DR Resource will respond to the DR Signal.

Any changes to the Resource or Asset that may impact participation or performance for the Event (such as Location and Load Profile) ~~shall~~should be provided through the Update Resource or Update Asset Messages.

Data ~~Requirements~~Elements

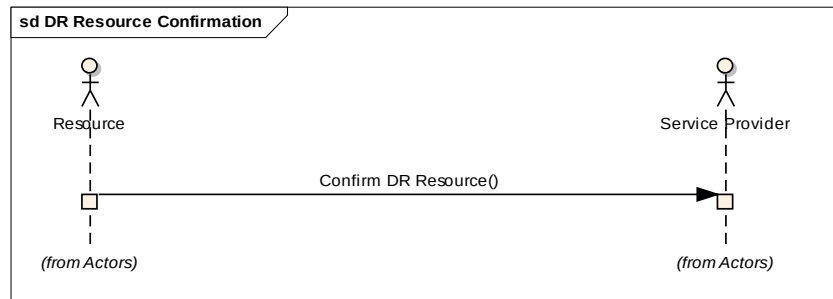
Attribute Name	Description
Resource ID	Identifier assigned to the Resource
Asset ID	The unique ~~identifier~~ <u>identifier</u> of the asset
Exception Conditions	This is used to report that the load controller may not behave as commanded because of a variety of conditions including: • Faults in device • Customer override.
Load Control State	The state of the load, which includes both commanded states and user settings. This may include a schedule of future states if a particular control algorithm for the load controller is being executed.
Operational Constraints	Operational Constraints at run time may differ from those provided at Enrollment, and will be applicable only to the time interval of the Event for this Resource or Asset.
Constraint Type	Type of operational, schedule or offer constraint
Constraint Interval	The timeframe over which the constraint type applies.
Constraint Value	Value of the Constraint Type and Interval
Offer Dispatch Status	Dispatch Status of Offer a.k.a. as “Opt-in” or “Opt-out” in existing programs.



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REQ.17.3.1.4.8 Broadcast DR Message (Price Plus Information)

Description

Demand Response programs are designed to address different power system concerns caused by the imbalance between generation, transmission and consumption, or environmental concerns. Some DR programs are conducted on a voluntary basis, where the customer can opt to maintain the level or load. Some DR programs are mandatory, where either the customer loads will be curtailed under certain conditions or the customer will incur financial penalties for noncompliance.

In retail market, certain “DR Messages” can be broadcasted to DR resources either directly or through Service Providers. DR Message is defined as information about the DR signals that may affect the demand behaviors of the energy consumers. Obviously, the main component of the DR Message is the pricing information. However, there are other attributes of energy being delivered that may be of interest to energy consumers and could be included in the DR Message.

Based on the OpenADR discussion, the broadcasting function is mainly used for volunteer or non-mission critical DR messages. Therefore, message acknowledgement or confirmation is optional.

DR Source of Power/Generation

“DR Message” also can be source of power or generation. ANSI C12.19-2008 defined the following source of power/generation in Standard Table 12.

Precondition:

The DR Service Provider sends the DR message to service providers. In the case of DR pricing, the DR Service Provider calculates the price



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per location and communicates the appropriate price associated with the DR product to service providers.

Post Condition:

DR Resources received the DR pricing information, and may or may not act based on the DR agreement or contract.

Data Requirements Elements

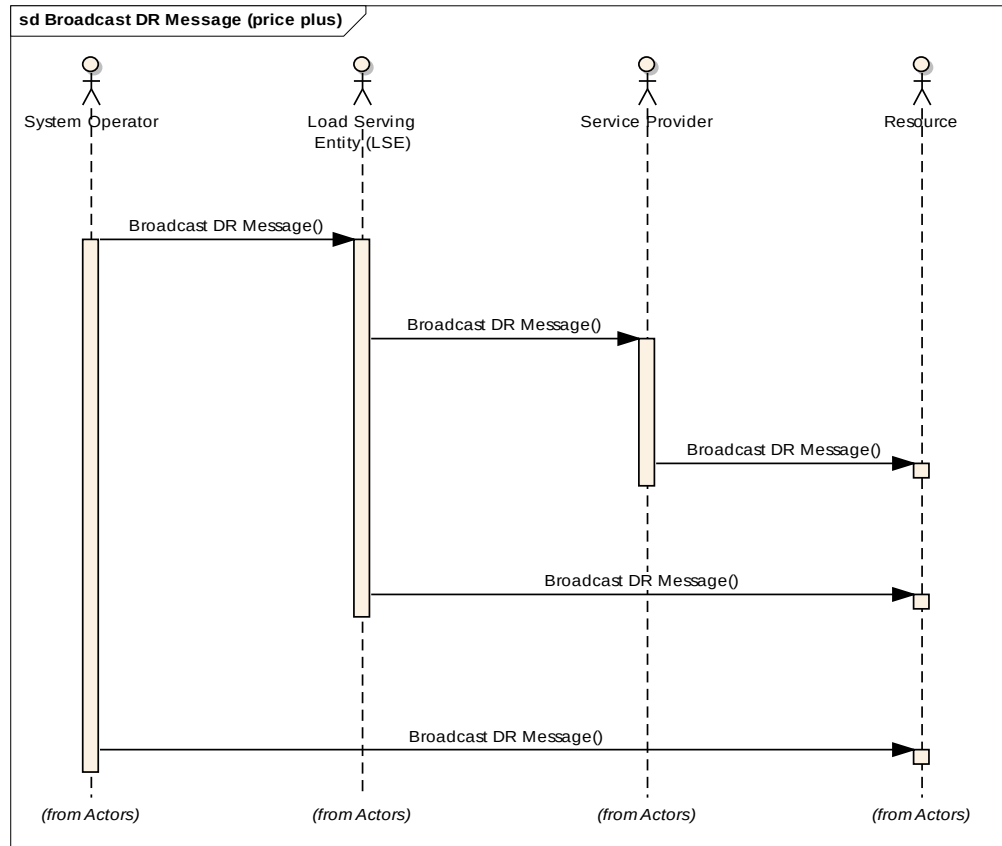
Attribute Name	Description
Currency	Economic unit of exchange in which the total price and price components are stated (e.g. dollars, euros)
Product Price	The sum of all Price Component Values for a given product (Total Price).
Product Price Factor	Terms of use attribute of Product Price Examples: Price absolute, Price relative, Price multiplier
Unit of Measure	Attribute of Product Identifier
Delivery Time	Time at which the product is available for physical consumption
Delivery Interval	The duration over which the product is available for physical consumption
Market Product (Product Type)	Market Product Product types include the following: energy, capacity, regulation, operating reserves (spinning or non-spin).



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Sequence Diagram



REQ.17.3.1.4.9 Dispatch DR Instructions (Retail)

Description

This interaction is used to dispatch DR Resources. This type of interaction is used when the Service Provider needs to achieve specific objectives from the DR Resources during DR events. This means that specific instructions will be given to the DR Resource with objectives (e.g. shed 100 kW) for the load profile of the DR Resource.

Note that for the retail use cases, a Dispatch is considered a special type of DR Notification, and thus, it is very similar in nature to the requirements given for that interaction.



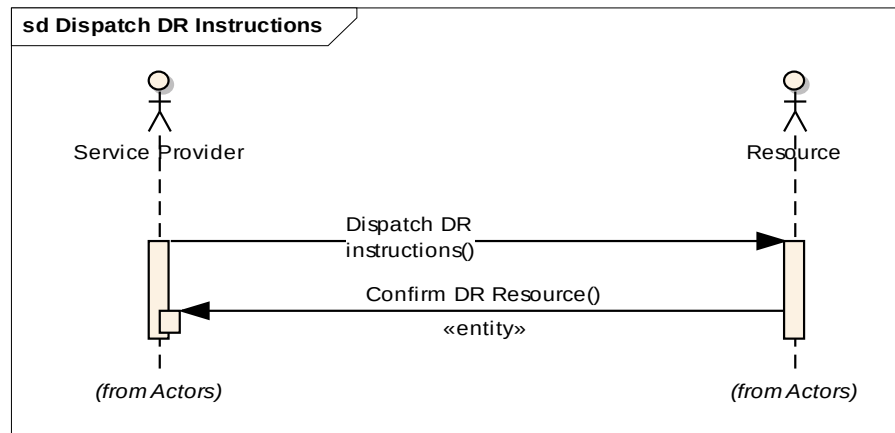
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Data RequirementsElements

Attribute Name	Description
DR Dispatches for DR Objective based messages are of three types.	
• LOAD LEVEL	
• LOAD AMOUNT	
• LOAD PERCENTAGE	
For Load Level: Load Level Value	Value of the load level to be achieved based on a set of enumerated values. (e.g. moderate, high, etc)
For Load Amount: Deployment MW	Deployment quantity expressed as an Absolute
For Load Percentage: Deployment MW	Relative Deployment quantity expressed as %.

Sequence Diagram



REQ.17.3.1.4.10 DR Direct Load Control (Retail)

Description

This use case covers direct interactions between the DR Service Provider and a specific DR Asset for the purposes of putting that asset into a specific load control state (e.g., to turn it on or off). In this case, the DR Asset is a DR Resource with only one DR Asset, and thus, the interaction is directly with the DR Asset.

See REQ.17.3.1.4.11.3, DR Execution - Direct Load Control (DLC) for more details.



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Data RequirementsElements

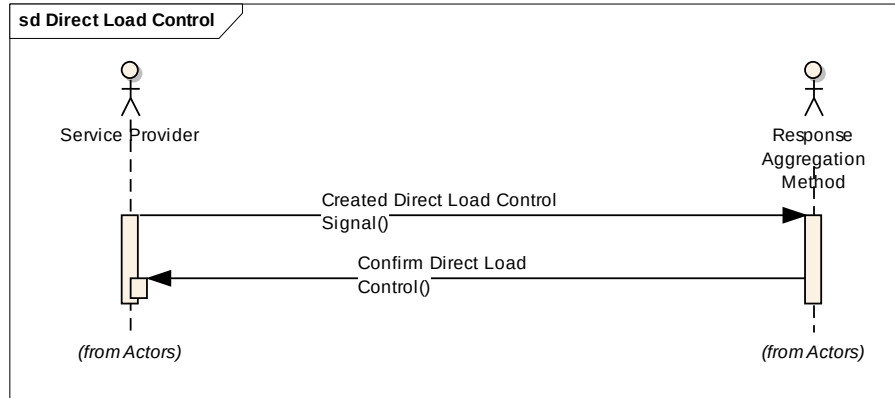
Attribute Name	Description
Asset ID	The unique ~~identifier~~ <u>identifier</u> of the asset (Note: Direct Load Control messages are applicable only to Assets)
Status Check	A signal to require the DR resource status to be sent back. (Only applicable to Direct Load Control)
DR Control Command: Direct Load Control Type	The type of DR Direct Load Control Command: e.g. Set Point, Open/Close, Heating Temperature - offset/setpoint, Cooling Temperature - offset/setpoint, Load adjustment offset
DR Control Command: Direct Load Control Value	Value associated with the Direct Load Control Type.
Event Start Time	Time of Start of deployment period for Event
Event End Time	Time of End of deployment period
Duty Cycle	“Duty Cycle-: Defines the maximum On state duty cycle as a percentage of time. Example, if the value is 80, the device would be in an “on state” for 80% of the time for the duration of the event. Range of the value is 0 to 100. A value of 0xFF indicates the field is not used.” (from SEP2.0) ³³⁴
Event Control	Event Control options for randomized start or end times: 1= Randomize Start time, 0=Randomized Start not Applied 1= Randomize End time, 0=Randomized End not Applied. (from SEP2.0) ³³⁴
Device Class	Enumeration representing the Device Class to apply the current Load Control Event. ³³⁴

Sequence Diagram



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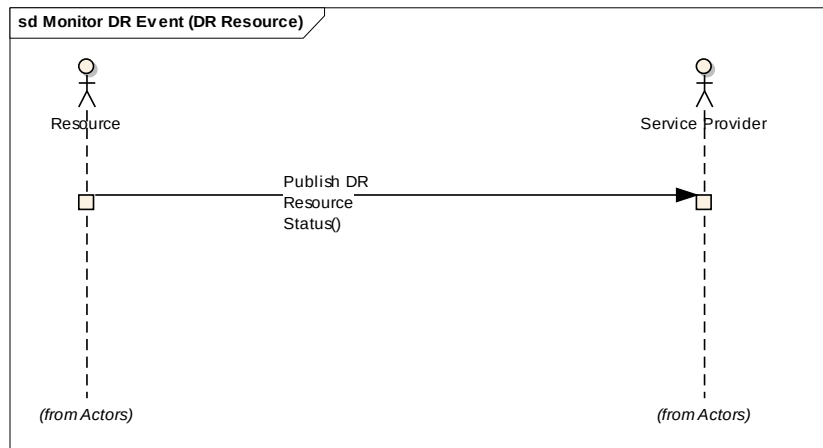
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REQ.17.3.1.4.10.1 Monitor DR Event (DR Resource)

Description

This interaction is used to monitor a DR Resource's behavior. It may be executed as a result of the DR Resource receiving a DR signal or it may be conducted continuously.

Sequence Diagram

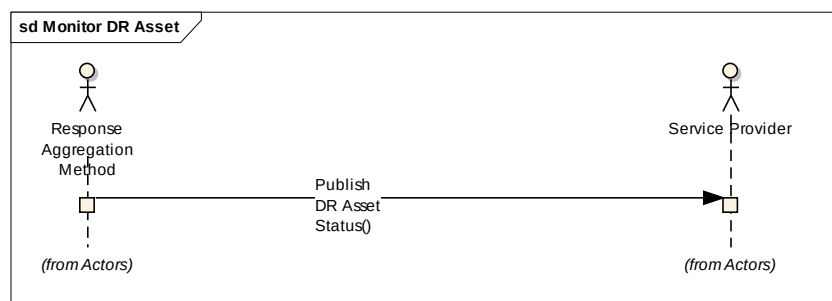


REQ.17.3.1.4.10.2 Monitor DR Event (DR Asset)

Description

This interaction is used to monitor the state of a DR Asset. It may be executed as a result of the DR Asset receiving a DR signal or it may be conducted continuously.

Sequence Diagram





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REQ.17.3.1.4.11 DR Event Execution

Demand Response is deployed for economic or a reliability purposes. At high penetration levels, demand response ~~has to~~ should be integrated with the power supply scheduling process, and it may impact the distribution grid operation and reliability, and perhaps the transmission grid operation and reliability. Thus it is important to include the required considerations for the grid and system level operations when developing DR Use Cases and DR signal standards. Such impacts may not be significant at low penetration levels; however, proper considerations ~~must~~ should be given to support scalability and expandability for future deployments.

Power system operates based on a real-time balancing of supply and demand. To economically schedule the supply, an accurate load forecast is needed. Traditionally, load forecast was generated using the historical consumption patterns, weather forecast and other similar parameters. With the potential of high-penetration of DR, it ~~will~~ may be necessary to incorporate the planned or forecasted DR levels into the load forecast. Also, DR capabilities can be used to support the power system capacity or emergency supply (ancillary service) needs. Such services ~~required~~ depend upon proper scheduling and monitoring capabilities.

A demand response event may be initiated by a power system operator in response to a reliability event, e.g., loss of a generating station causing a lack of supply to meet demand, or an uncontrolled set of PEVs overloading of a distribution transformer. A demand response event may also be initiated by utility operational systems based on economic considerations, e.g., reducing or shifting peak load at the system level or at specific feeder or facility. Demand response may also be initiated by a customer in response to a market pricing signal

~~Considering that t~~he distribution grid in the US is typically a three-phase imbalance circuit, i.e., many customers are on a single-phase or two-phase of the three-phase system. Thus significant changes in customer load patters could result in undesirable imbalanced conditions on a feeder. Also, load pickup following the termination of a major DR event could possibly cause overloads and other operational problems, if the load pickup is not properly scattered/managed.



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The following provides three representative use cases to highlight some the key interactions. These include:

- Dynamic Price-based DR
- Notification-based DR
- Direct Load Control

REQ.17.3.1.4.11.1 DR Execution – Retail Time Pricing (RTP)

Description

~~Provide~~ Real-time or dynamic pricing (RTP) may be provided to retail customers so that customers can vary their demand based on pricing signals. RTP represents retail electricity rates that vary as a function of time

Traditionally, retail tariff has based on a fixed or tiered rate structure with possible considerations of static rates for pre-established time of use (TOU) conditions. Real time or dynamic pricing (RTP) represent retail electricity rate that could vary as a function of time and is intended to modify demand. It requires interval metering for accurate billing based on time-varying prices. A number of states have implemented RTP or other dynamic pricing tariffs for large customers. With a broader deployment of advanced meters, RTP rates may become more common nation-wide.

The scenario presented here represents a case where a location-dependent real-time retail pricing for energy is established based on the Locational Marginal Price (LMP) for that location. LMP values are typically established by an ISO (for regions covered by an ISO/RTO) on a day-ahead (hourly resolution) and real-time basis, typically on a five minute resolution. For the RTP, it may be appropriate to use the real-time LMP as the basis for computing the retail dynamic tariff. However, decisions should be made on the time and the spatial resolution of the RTP. For example, an hourly RTP averaging the five minute pricing values, or a Critical Peak Pricing model to reflect the extreme conditions only, may be adopted. In addition to the energy price, the retail RTP rate may also include the appropriate uplift charges to cover for distribution wire/services charges and for the power loss compensations. Note that the uplift charges are typically subject to a regulatory review and approval.

Special care must be given to the RTP rate design to ensure customer acceptance and adaptation. Also grid operational

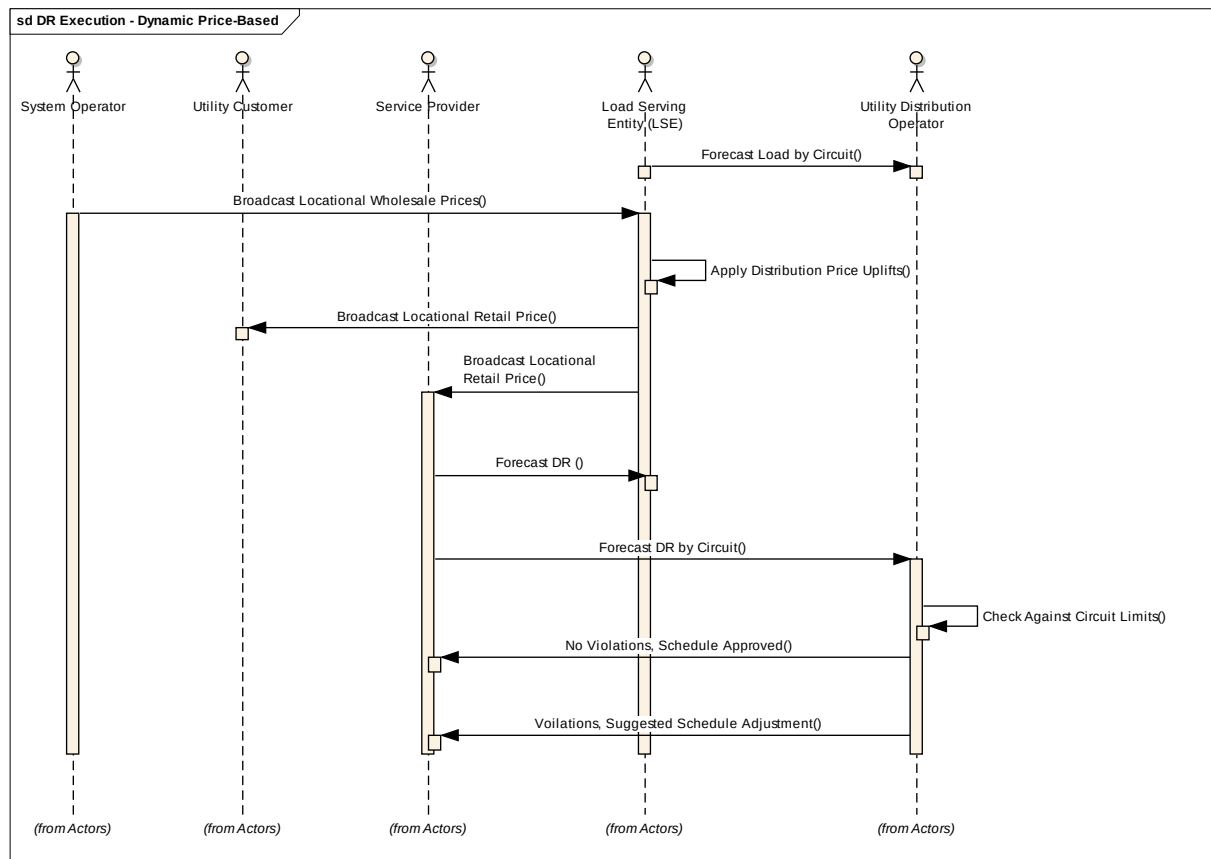


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issues may have to be addressed. For example, during low LMP (RTP) periods (e.g., at night), certain distribution circuits may get over loaded (congested), with customers shifting consumption, e.g., charging PEVs, to that period. This improves the overall system economy, but may cause circuit congestion. To combat this, some have proposed use of demand charges or an additional incentive payment for load reduction, a locational incentive to relief congestion.

Sequence Diagram





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REQ.17.3.1.4.11.2 DR Execution – Notification Based

Description

Notification-based DR is mostly used for economic purposes based on a day-ahead or hours or hour-ahead basis. Notification-based DR may also be used for reliability events when the system operator expects a contingency or operating condition (e.g., congestion or planned outage) on the distribution or the transmission grid that requires a reduction (or an increase) on the load at a given location.

Considering that the business processes for demand response have not yet been standardized across the nations, the following is a representative scenario that captures some of the interactions between the key stakeholders (actors).

At high penetration levels, the DR operation, especially on a day-ahead or hour ahead basis, ~~need to~~ should be coordinated with the overall operations and supply scheduling process. As is shown in the Sequence Diagram below, this may require a timely update of the “locational” load forecast and an up-to-date nomination of the DR capabilities. This information may be supplied to the “system” and/or market operator to be incorporated in the overall supply and demand scheduling process. The DR capabilities are specified by the DR Provider to the System Operator based on a DR Program, a price curve, or other nomination protocol. The DR Provider may also inform the Load Serving Entity (LSE) of the locational available DR capabilities.

The notification-based DR dispatch process is typically initiated by the System or Market Operator; the process may also be initiated by an LSE or UDO. It is also possible that the DR Provider be the initiator of the DR process based on a market opportunity (economic operation) or based on a pre-established program.

At high DR penetration levels, it is expected that the DR provider will ~~need to~~ clear the DR schedule with the Distribution Grid Operator, the UDO. This is to ~~help ensure~~ help ensure that the high penetration DR has no adverse impact on the distribution grid reliability and power quality, e.g., cause of excessive imbalances, voltage violation, or an overload during load pickup period. The UDO, in a timely fashion, ~~will~~ should inform the DR Provider, if the schedule is cleared or requires an adjustment. Please note that if the DR deployed by a utility company that includes both LSE and UDO functions, such coordination typically is performed within the company's

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Following the clearing the DR schedule, notifications are sent to customers for DR operation. Under this scenario, the Market Operator and the LSE are also informed of the final DR schedule.

```
sequenceDiagram
    actor SMO as System and Market Operator
    actor DRP as DR Provider
    actor EC as Electricity Consumer
    actor LSE as Load Serving Entity (LSE)
    actor UDC as Utility Distribution Company (UDC)

    SMO->>DRP: DR Nomination()
    DRP->>EC: DR Nomination()
    EC->>LSE: DR Capability()
    LSE->>UDC: Load Forecast By Circuit()
    UDC->>SMO: Load Forecast()

    SMO->>DRP: DR Dispatch Instruction()
    DRP->>LSE: DR Dispatch Instruction()
    LSE->>UDC: DR Schedule by Circuit()
    UDC->>UDC: Check Against Circuit Limits()
    UDC->>DRP: No Violations, Schedule Approved()
    DRP->>SMO: Final DR Schedule()
    DRP->>LSE: Final DR Schedule()
    DRP->>EC: Notification to Customer()

    Note over SMO: (from Actors)
    Note over DRP: (from Actors)
    Note over EC: (from Actors)
    Note over LSE: (from Actors)
    Note over UDC: (from Actors)
```



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REQ.17.3.1.4.11.3 DR Execution – Direct Load Control (DLC)

Description

Direct-Load Control is typically used for reliability-based events such as contingency and emergency support, supply of balancing energy or other ancillary service. Many of these programs may require quick response time, e.g., five minutes or faster, that ~~is practically only possible~~ may be enabled through a DLC capability. Direct-Load Control may also be used for economic operations, e.g., water heater programs to reduce or shift peak load.

Considering that the business processes for demand response have not yet been standardized across the nations, the following is a representative DLC scenario that captures ~~sample the~~ interactions between the key stakeholders (actors).

Direct Load Control is typically called for by a system operator, a transmission or distribution operator. It could be also issued by a Market Operator based on an ancillary service DR award, or by an LSE or DRP for an economic purpose. At high penetration levels, DLC operation ~~needs to~~ should be coordinated with the distribution grid operator, the UDO.

As is shown in the sequence diagram below, the customer DR capabilities are aggregated by location and specified/nominated to the Distribution Grid Operator, Load Serving Entity, and/or to the System/Market Operator. In addition to location, the capabilities may also be aggregated by the DR response time, e.g., four seconds, five minutes, 30 minutes, etc.

The DLC Dispatch process ~~is~~ typically is initiated by the Transmission or Distribution Operator. The process may also be initiated by the Market Operator or the LSE. The actual control of the DR resources may be done by the DR provider based on the dispatch signal received.

At high DR penetration levels, it is expected that the DLC activation schedule to be coordinated with the Distribution Grid Operator, the UDO. This is to ~~help e~~ ensure that there are no adverse impact on the distribution grid reliability and power quality, e.g., voltage violation, excessive phase imbalances, or an overload during load pickup period. If the DLC is deployed by a utility company, such coordination can be accomplished within the company's DR and distribution management systems, or performed as an integral part of the DR control functions.

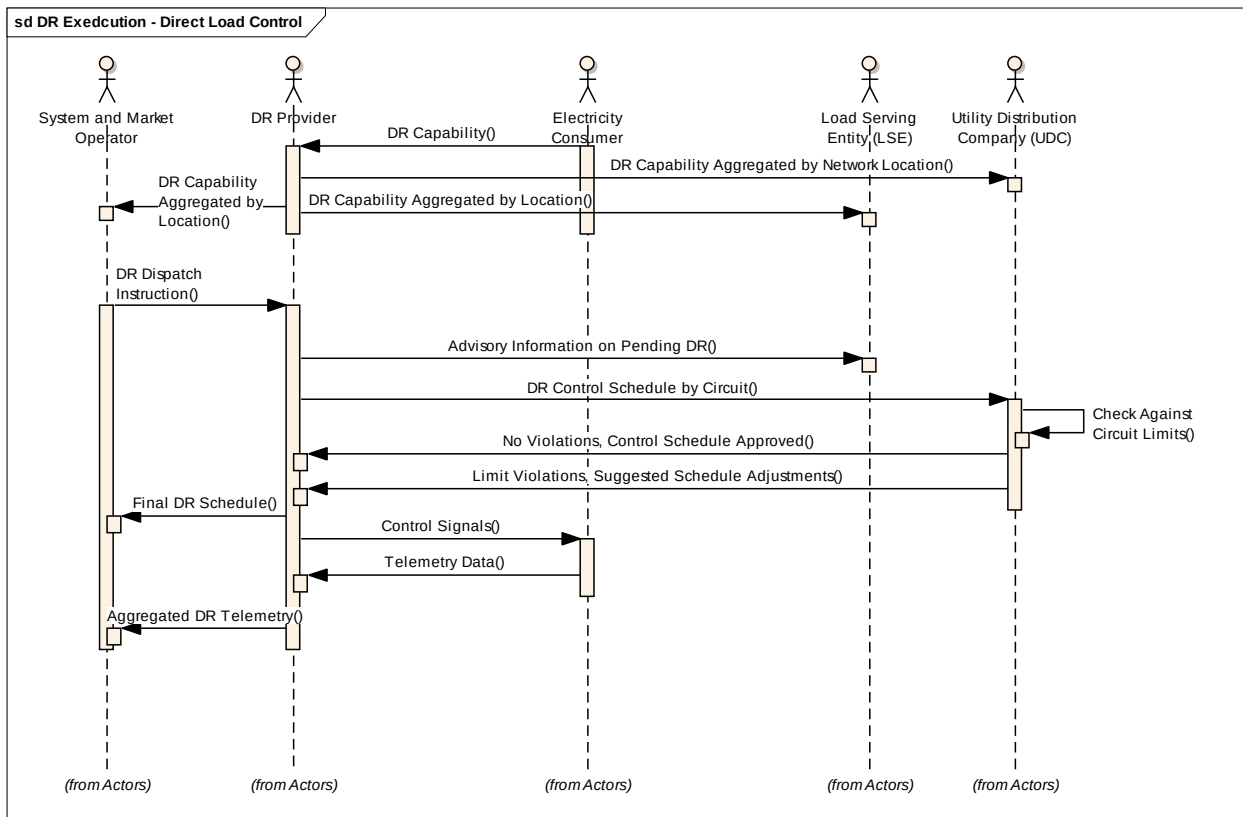


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For a “fast” DR, e.g., provision of ancillary services, a telemetry capability is may be required to enable the real-time monitoring of the resource condition and its response to the DR control signal.

Sequence Diagram



REQ.17.3.1.4.12 Operational Coordination

Due to the existing differences in the regional retail energy market regulations, wholesale market structure and protocols, and supply and demand conditions, currently there are regional differences in business practices and processes governing demand response. As a result, operational coordination requirements for demand response would somewhat vary from region to region, depending on the available retail tariff, retail market structure, available wholesale market for DR and the market mechanics.

The following table summarizes the major roles and responsibilities of the typical key stakeholders with respect to demand response operation. As can be seen in this table, a significant level of stakeholder coordination is may be required for an end-to-end DR



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operation spanning from the wholesale markets to the end-use customers.

Stakeholder	Sample Key Responsibilities/Roles
Wholesale Market Operator	- Establish, administer, and operate wholesale demand response programs and markets; - Determine and publish locational prices for wholesale demand response products; - Improve energy market efficiencies (economics) by integrating demand response products and capabilities; - Monitor compliance to wholesale DR instructions and financially settle with the participating stakeholders.
Transmission Grid / System Operator - Balancing Authority	- Monitor and maintain transmission grid reliability, and call upon wholesale demand-side (demand response) capabilities to address contingency/emergency conditions; - Dispatch demand-side capabilities to balance supply and demand, e.g., mitigating impact of variable generation (e.g., wind). - In regions with no organized wholesale energy market, economically dispatch available generation and demand resources including demand response to optimize supply economics.



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~~Stakeholder~~	<u>Sample Key Responsibilities</u> <u>Roles</u>
Distribution Grid Operator – Utility Distribution Company	- Monitor and maintain the distribution grid reliability and the quality of power supply (e.g., voltage levels). Call upon DR to mitigate the distribution contingencies and reliability concerns. - Review and approve the integration of distributed energy resources with the distribution grid. - Assess the operational impact of distributed resources and demand response (DR/DER) on power quality and reliability of the distribution grid, approve high-penetration DR schedules (especially cold-load pickup operation). - Coordinate with the respective Load Serving Entity and Energy Service Providers for the assessment of distribution service and loss compensation charges to retail customers.
Load Serving Entity	- Forecast load and economically schedule supply to meet demand at all times. Incorporate demand response capabilities to improve load factor, reducing/shifting peak load. - Establish and obtain regulatory approval for a ~~fair and unbiased~~ retail tariff for ~~all~~ <u>various</u> customer classes. For real-time dynamic pricing (RTP) tariff, apply distribution service, loss compensation and other uplifts to the wholesale locational prices. - Establish and administer demand response and distributed resource management programs including DR tariff. - Meet regional requirements for Renewable Portfolio Standards compliance for power delivery. - Aggregate and schedule DR capabilities in wholesale markets, manage DR programs. - Manage customer metering and billing process.



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Stakeholder	Sample Key Responsibilities
Power Marketer	- Forecast load and economically schedule supply to meet demand ~~at all times~~. Incorporate demand response capabilities to improve load factor, reducing/shifting peak load. - Establish and obtain regulatory approval for a ~~fair and unbiased~~ retail tariff for ~~all~~ various customer classes. For real-time dynamic pricing (RTP) tariff, apply distribution service, loss compensation and other uplifts to the wholesale locational prices. - Operate a wholesale and/or retail demand response programs with wholesale and/or retail customers.
Energy Service Provider	- Operate only in regions with competitive retail market - Be an alternative supplier of electric power to end-use customers by offering competitive products, services and prices. - Forecast aggregated load of the enrolled customers by location as required. - Coordinate the power supply with the respective LSE and UDO. - Support demand response programs (DR/DER) for enrolled customers. - Aggregate demand and demand-side capabilities; schedule the aggregated load and DR capabilities in wholesale markets. - Provide for DR telemetry and other monitoring requirements, on a resource or aggregated basis. - Apply the necessary uplifts (e.g., distribution service and loss compensation charges) to the wholesale locational prices. <u>Help</u> ~~Meet~~ regional requirements for Renewable Portfolio Standards compliance for power delivery. - Bill and settle with customers for energy supply and DR operation.



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Stakeholder	Sample Key Responsibilities/Roles
Demand Response Provider	- Offer ~~competitive~~ demand response services to the end-use customers. - Design and manage DR programs, establish pricing structure and signals for DR operation - Aggregate demand and demand-side capabilities; and offer/schedule these capabilities with the respective LSE or the wholesale market. - Provide for DR telemetry and other monitoring requirements, on a resource or aggregated basis. - Bill and settle with customers for energy supply and DR operation.
Electricity Customer	- Subscribe to a DR program, and update DR availability and capability information as appropriate - Maintain DR resources, data communications, telemetry, metering and control devices as <u>may be</u> required. - Respond to pricing signals, DR notifications, or control signals as appropriate.

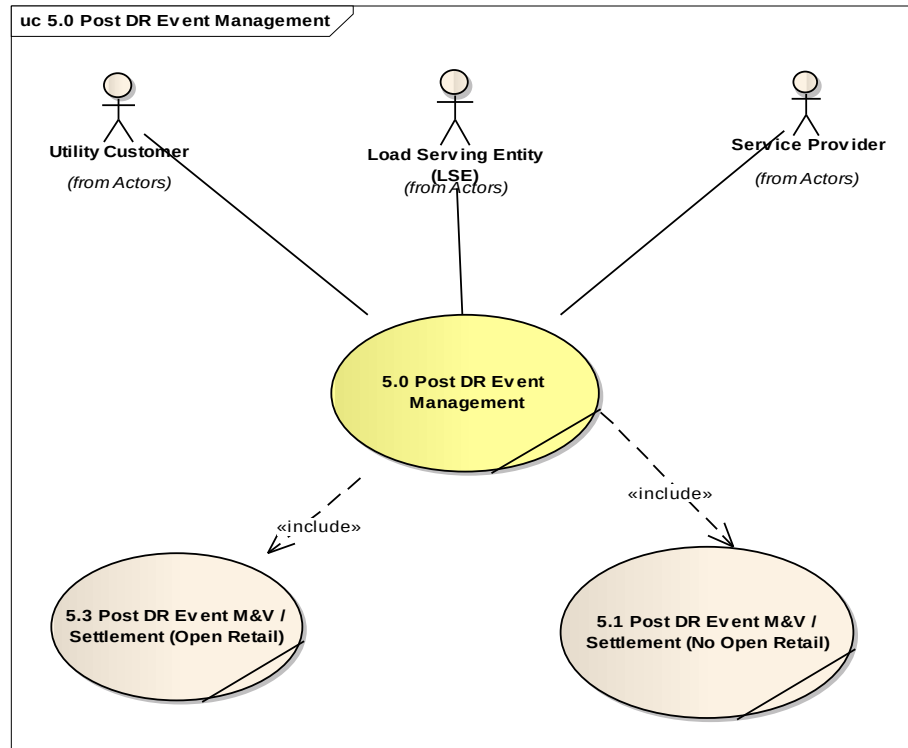


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REQ.17.3.1.4.13 Post DR Event Management

Post DR event management mainly concerns with the reconciliation of the actual consumption of energy within the duration of a DR event with the expected behavior so that proper financial reward or penalties could be carried out. ~~The NAESB M&V standard for DR defines the requirements for most of the post event management.~~ The following use cases describe post DR event management for three different market types.





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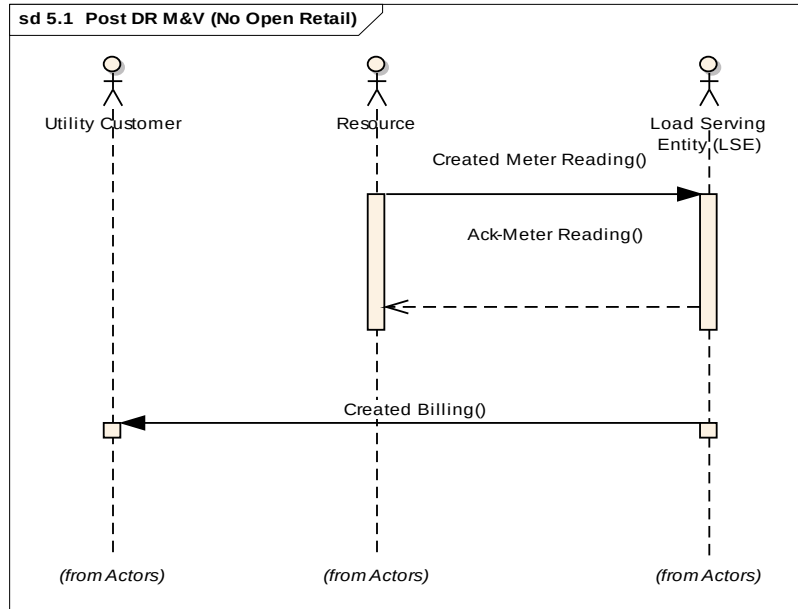
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REQ.17.3.1.4.13.1 Post DR Event M&V / Settlement (No Open Retail)

Description

After DR Event has been completed, then Measurement and Verification (M&V) can confirm whether action has been taken or to measure the impact of the response. After the M&V, then the Financial Settlement is may be calculated and sent to the Electricity Customer⁴. This Use Case covers the scenarios with no Open Retail Markets.

Sequence Diagram



⁴ In wholesale markets, the settlement for a DR Event is between the System Operator and Market Participant and possibly between the Market Participant and the Electricity Customer.



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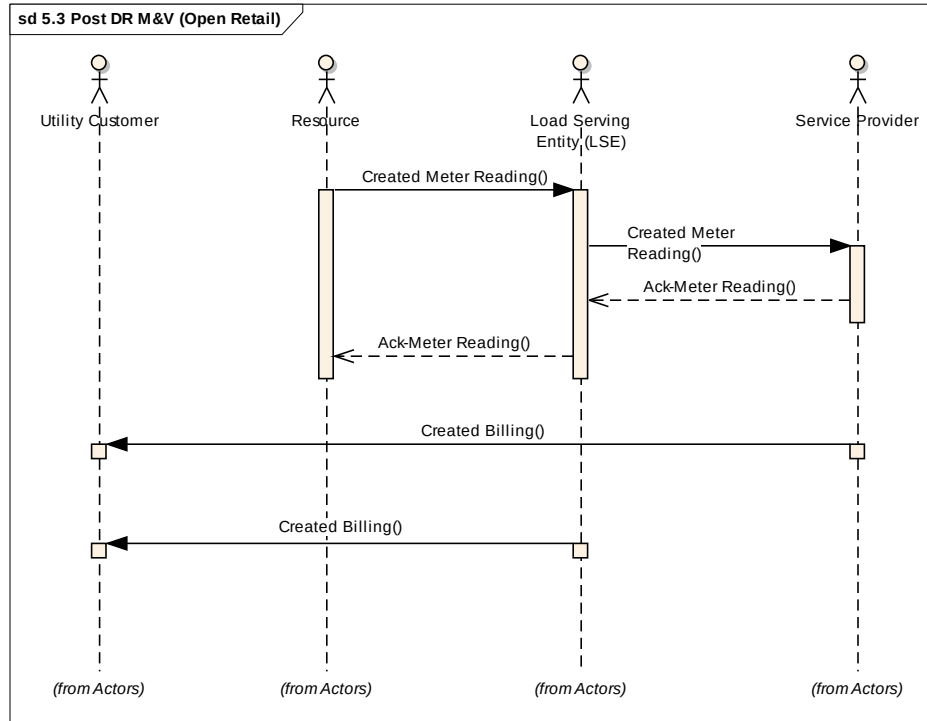
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REQ.17.3.1.4.13.2 Post DR Event M&V / Settlement (Open Retail)

Description

After DR Event has been completed, Measurement and Verification (M&V) can confirm action has been taken or to measure the impact of the response. After the M&V, the Financial Settlement is can be calculated and sent to the Electricity Customer. This Use Case covers the scenarios with Open Retail Markets.

Sequence Diagram





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REQ.17-A Appendix A – Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall information model for demand response. Figure 1A contains a data model used to illustrate the entity-relationships within the model. Abbreviations/Acronyms correspond to the IDs shown in the figure.

Proper (and Improper) Usage of the Entity-Relationship Model. The entity-relationship model is used to show cardinality among objects in the model, for example every Resource belongs to one and only one Service Provider and a Service Location contains one or more Service Delivery Points. The entity-relationship model does not provide use case information; actors are objects in the model and do not “act” in the model. The entity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the enrollment of those Resources may be managed by a System Operators or a Utility Distribution Operator. Both use cases and process maps are separate components of the Model Business Practices.

Reading Crow’s Foot Notation. Objects in the model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow’s Foot notation, as documents in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a Service Location is related to one-or-more Service Delivery Points (reading top to bottom) and every Service Delivery Point is related to exactly-one Service Location (reading bottom to top).

Optional Entities, Roles and Objects. The entity-relationship model is designed to support multiple business models and not every business model will require all entities, roles and/or objects to function. Therefore, all-entities, roles and objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.

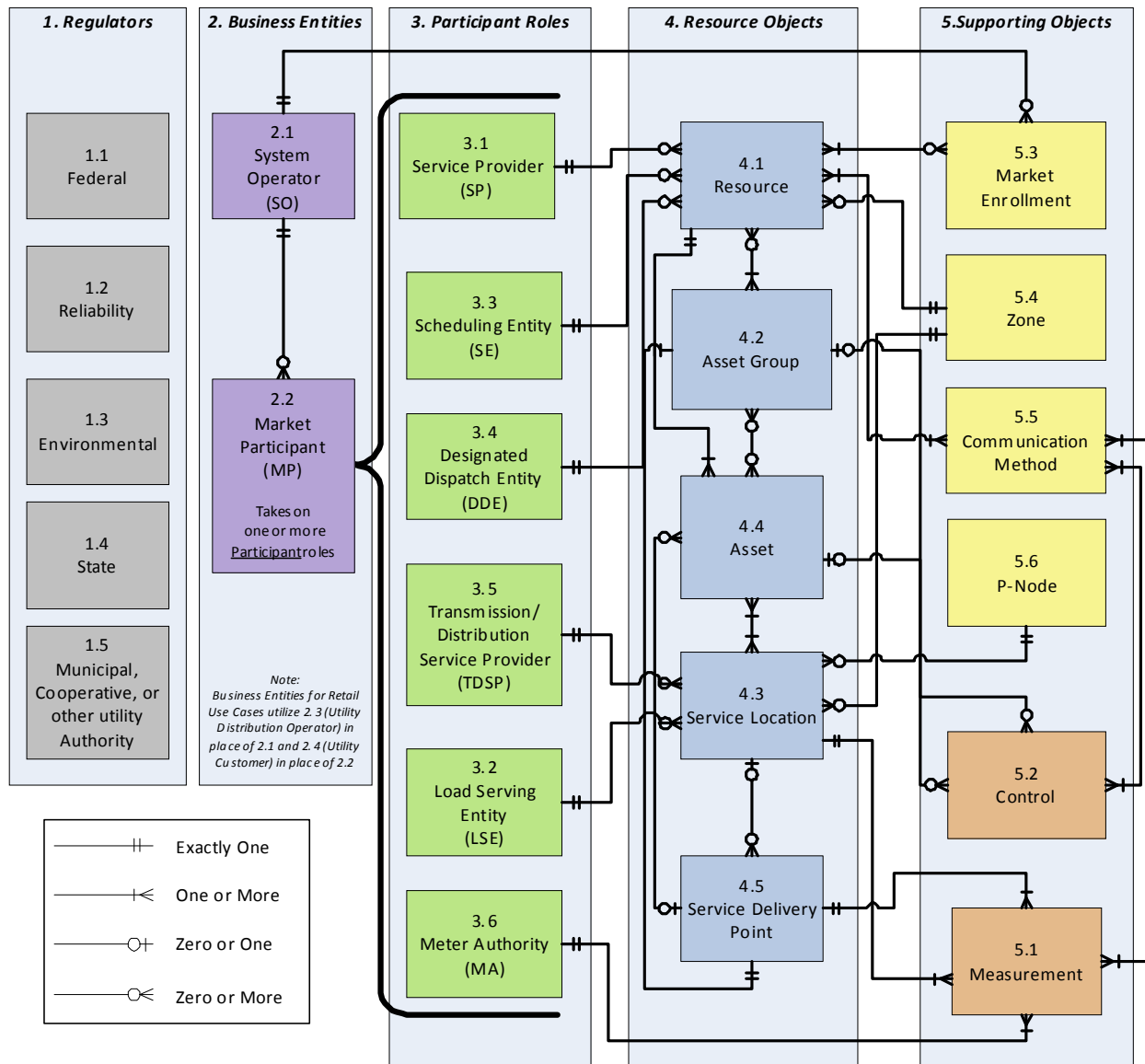
Applicability to Retail and Wholesale. The entity-relationship model is applicable to both wholesale and retail. When using the model for wholesale, the applicable business entities are 2.1 (System Operator) and 2.3 (Market Participant), while in retail markets, the parallel business entities are 2.3 (Utility Distribution Operator) and 2.4 (Utility Customers). Other than the swapping of the two pairs of terms, the models are identical, including the names of and relationships among objects.



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Figure 1A. Sample Entity-Relationship Model for Smart Grid Use Cases





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4. Supporting Documentation

a. Description of Request:

REQ Annual Plan Item 9(c) – “Develop Requirements and Use Cases for PAP 09 – Demand Response/Distributed Energy Resources”

b. Description of Recommendation:

This recommendation provides the data requirements elements related to the use cases developed as part of the phase one effort

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the development of standard DR and DER signals.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- March 11, 2010 Meeting Notes – To be posted
- March 18, 2010 Meeting Notes – To be posted
- March 25, 2010 Meeting Notes – To be posted
- April 1, 2010 Meeting Notes – To be posted
- April 8, 2010 Meeting Notes – To be posted
- April 29, 2010 Meeting Notes – To be posted
- May 13, 2010 Meeting Notes – To be posted
- May 20, 2010 Meeting Notes – To be posted
- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes – To be posted
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc
- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc



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- September 9, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes – To be posted



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1. RECOMMENDED ACTION:

☒ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The business process flows, use cases and data ~~requirements~~ elements presented in this document illustrate the standard interactions between Utility Distribution Operator, Service Provider (Demand Response) and Utility Customer for the administration and deployment of demand response resources for retail markets.

RECOMMENDED STANDARDS:

In response to NIST's Priority Action Plan 9, this document provides ~~requirements~~ elements specifications, in the form of business process flows, use cases and data ~~elements~~ requirements in certain areas, to support the standardization of the information exchange between Utility Distribution Operator, Service Provider (Demand Response) and Utility Customer. This document shares a standard set of actors and terminologies with the companion Requirements Specification for Wholesale Standard DR Signals.



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.2.B

New REQ.17.2.B Defined Terms to be added to REQ.17 are included in the Recommendation Request Titled Phase Two Requirements Specification for Common Electricity Product and Pricing Definition for NIST PAP03 to avoid redundancy between recommendations.

RECOMMENDED STANDARDS:

Specifications for Retail Standard Demand Response Signals

Executive Summary

Specifications for Retail Standard Demand Response Signals

The North America Energy Standards Board (NAESB) Smart Grid Standards Subcommittee took the responsibility of consolidating and developing DR use cases that provide requirements specifications for developing DR control and pricing signal standards, which is called for by National Institute of Standards and Technology (NIST) Priority Action Plans (PAP) 03 and 09. This document addresses the business and data requirements-specifications for standardizing control and pricing signals for Retail level Demand Response (DR) and Distributed Energy Resources (DER) as part of the Smart Grid implementation. Wholesale market DR and DER information exchanges are outside the scope of this document and are addressed in the Requirements-Specifications for Wholesale DR signals. The first step of use case development is the development of the Framework for Integrated DR and DER Models document, which provides an overall business context for DR and DER Models.

According to the Framework Document findings:

1. DR signals standardization must-should support all four market types; i.e. regions with a) no open wholesale and no retail competition, b) open wholesale market only, c) open retail competition only, d) open wholesale and open retail competition. It must also consider key differences that exist and will continue to exist in all four market types.
2. Wholesale market DR and pricing signals have different characteristics than retail market DR and pricing signals, although commonality in format is feasible.
3. Most Customers (with a few exception of Commercial and Industrial (C&I) Customers) will not interact directly with wholesale market when it comes to DR and pricing signals.
4. Retail pricing models are complex, due to the numerous tariff rate structures that exist in both regulated and un-regulated markets. Attempts to standardize DR control and pricing signals must not hinder regulatory changes or market innovations when it comes to future tariff or pricing models.
5. New business entities (Energy Service Providers (ESP), Demand Response Providers (DRP), Service Providers, and Energy Information Service Providers (ESIP)) as well as new customer energy management systems will-may play an increasing role in DR implementation.



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6. DER may play an increasingly important role in DR, yet the development of tariff and/or pricing models that support DER's role in DR is still in its infancy.
7. The Customer's perspective and ability to react to DR control and pricing signals ~~must~~ should be a key driver during the development of DR standards.

The following deals exclusively with the retail level demand response signals ~~requirements~~specifications. The ~~requirements~~specifications are captured in the form of UML models, where business ~~requirements~~specifications are captured in Use Case narrative format, data ~~requirements~~specifications are captured in tabular format, and information exchange flows are captured in sequence diagram format. The top level use cases for retail DR are:

1. Administrate DR Program
2. Administrate Customer for DR
3. Administrate DR Resource
4. Execute DR Event
5. Post DR Event Management

The intent is to clearly specify the business information that may be necessary to be exchanged to make effective and reasonable business decisions, standards or implementations that do not directly use such schemas and element names may conform to these requirements through clearly defined mapping documentation.
All data element names and implied or stated structures are not intended to specify specific message payloads or information object. The intent is to clearly specify the business information that may be necessary to be exchanged to make effective and reasonable business decisions, and NAESB understands that standards that do not directly use such schemas and element names may conform to these requirements.

Introduction

Specifications for Retail Standard Demand Response Signals

This Model Business Practice and data elements included herein are not intended to (i) require the use of any of these data elements, (ii) require the provision or purchase of any products, programs, rates, markets or services, or (iii) supersede ~~replace~~ applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this Model Business Practice.

Purpose: The purpose of the following is to capture business and data ~~requirements~~specifications for Retail Level DR signals between entities that control and manage the DR programs and entities that provide demand response with DR resources and assets. This is to fulfill the NAESB SGTF responsibility under the NIST Smart Grid Interoperability Standards development PAP09. This requirements document will then be used by other standards development organizations identified by NIST PAP09 for further development of DR signals technical specifications for both C&I customer and residential customer markets.



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Scope: The scope of the following is to provide business and data requirements-specifications for standardizing Demand Response signals at the retail (distribution) level.

Commentary on Distributed Energy Resources: In the context of this report, Distributed Energy Resources (DER) are dispatchable energy generation and storage technologies, typically up to ten MWs in size, that are interconnected to the distribution grid to provide electric capacity and/or energy to a customer or a group of customers and potentially export the excess to the grid for economical purposes. DER systems can generate electric power, as opposed to curtailable or interruptible loads that can just reduce electric loading on the grid.

DER may be subdivided into distributed generation (DG), distributed storage, and plug-in electric vehicles (PEVs):

Distributed generation (DG) technologies can be divided into a) **Renewable Generation**, e.g., small wind power systems, solar photovoltaic (PV), Fuel Cells, Bio-fuel generators and Digesters, nuclear, hydro and other generation resources using renewable fuel, and b) **Non-Renewable Generation**, e.g., micro-turbines, small combustion turbines, diesel, natural gas and dual-fueled engines, etc.

Storage resources could be divided into a) **Electric Storage**, e.g., battery systems and uninterruptible power supplies (UPS), flywheel, superconducting magnetic energy storage (SMES), etc. and b) **Thermal Storage** – These convert electric power to thermal (cooling/heating) energy for later use, e.g., Ice-based air cooling system, and high-capacity brick-based air heating system.

Plug-in electric and hybrid vehicles (PEV/PHEV) may also be considered as DER, The electric vehicles may be used to supply stored electric energy back to the grid, a.k.a. Vehicle-to-grid (V2G).

Behind-the-meter DER may be bundled with regular load and managed alongside the demand response resources – such as a residential roof-top PV solar panel. But often, DER is treated separately in part due to its control capabilities. In addition to a regular retail tariff, behind-the-meter DER may be subject to net-metering or feed-in tariff, where excess generation can be exported to the grid at an established or a dynamic price.

Similar to DR resources, DER assets need-to-can be registered and enrolled into a DR program. Furthermore, DER assets are typically required to meet additional technical requirements and certification for grid interconnection. Depending on the size of a DER and its export capabilities, sub-metering and telemetry capabilities may be required to monitor the impact of the DER operation on the distribution grid reliability and power quality. Also, renewable resources may receive Renewable Energy Credits (RECs) and may also qualify as a must-run resource, e.g., wind power in some regions. These need to be incorporated into pricing and control signals associated with DER operation.

The North American Energy Standards Board (NAESB) is a voluntary non-profit organization comprised of members from all aspects of the natural gas and electric industries. Within



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NAESB, the Retail Electric Quadrant (REQ) and the Retail Gas Quadrant (RGQ) focus on issues impacting the retail sale of energy to Retail Customers. REQ / RGQ Model Business Practices are intended to provide guidance to Distribution Companies, and other Market Participants involved in providing energy service to Retail Customers.

These Model Business Practices are voluntary and do not address policy issues that are the subject of state legislation or regulatory decisions. These Model Business Practices have been adopted with the realization that as the industry evolves, additional and amended Model Business Practices may be necessary. Any industry participant seeking additional or amended Model Business Practices (including principles, definitions, data elements, process descriptions, and technical implementation instructions) should submit a request to the NAESB office, detailing the change, so that the appropriate process may take place to amend the Model Business Practice.

REQ.17.1 Principles

REQ.17.2 Definitions

REQ.17.2.A Business Definitions (Reserved)

REQ.17.2.B Technical Definitions

New REQ.17.2.B Defined Terms to be added to REQ.17 are included in the Recommendation Request Titled Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03 (REQ.15) to avoid redundancy between Model Business Practices.



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REQ.17.3 Model Business Practices

REQ.17.3.1 Specifications for Retail Standard Demand Response Signals

The following describes general business processes for implementing demand response capacities at the retail market level. The following principles apply to the development and application of these business process requirementspractices.

#	Name	Description	Rationale	Implication
1	Scalability	The architecture should allow for the management of millions of Customer premises devices	Scale-out, adding more low-cost machines, has proven to be superior to scale-up, using larger single machines, as a way to handle large loads. For example, high traffic web sites use farms of low-cost machines to serve pages to millions of simultaneous web users.	Architecture should allow the solution to scale-out as more devices are added.
2	Actionable, testable, and transferable work products	Any work (artifacts) that are created can be used by the audience for this work, e.g., utilities, vendors, regulators, etc. There needs to be clear, explicit guidance for how to use the artifacts. There is an expectation that the work products are useful at lower levels of design.	Such work products will promote market adoption and minimize the cost and risk of adoption, leverage open and best practices, and establish repeatable processes, patterns, and templates for all work products.	The use of common tools and methods will be fostered. Organizations that do not follow the use of the common tools and methods may have more difficulty implementing the artifacts.



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#	Name	Description	Rationale	Implication
3	Platform Independence, Vendor Neutral	Requirements and design artifacts ~~should~~ be platform independent. Implementation technology shall be chosen due to its level of acceptance at the marketplace as open standards.	There is an expectation of differentiation and innovation in the marketplace. With greater dependence on a specific platform, there may be less architectural flexibility.	To achieve both technical and semantic interoperability, certain lower level technologies will need to be chosen. For example, Web Services technology is widely used for integration, and UML is widely used for modeling.
4	Cyber Secure	Architecture ~~must~~ <u>should</u> incorporate latest secure computing techniques.	The integrity of the electric grid and market depend on preventing unauthorized actors from manipulating the DR and DER system.	Architecture ~~must~~ <u>should</u> comply with the latest security guidance from the NIST SGIP Architecture Committee and CyberSecurity Task Group, when it comes to Web Services security related implementation.
5	Interoperability	DR signaling standards should utilize open, interoperable industry standard control and communication technologies to integrate with both common energy management and control systems that can conduct DR activities	Interoperability across different domains of Smart Grid is key to the success of DR signaling standards ~~as it ensures level playing field for innovative solutions for all participants of the Smart Grid.~~	DR signaling standards ~~must~~ <u>should</u> be developed in harmonization with others relevant standards as identified by the NIST SGIP.



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#	Name	Description	Rationale	Implication
6	Automatic Demand Response	The DR program (analysis, notification, event, action, monitoring, verification, settlement) should be automatic. DR signaling standards should provide secure, reliable communications with consumers for DR operations	Automation ~~is the only way helps to~~ ensure large scale and repeatable demand response implementation.	Security, reliability and testability ~~must~~ <u>should</u> be ensured for DR automation.
7	Cover All Market Types	DR signaling standards should be supported and implementable in all four market types listed in this document	Standards development ~~shall~~ <u>should</u> not get in the way of regulatory policy decisions.	DR signals design need to support a wide range of programs and tariff/pricing structures.

REQ.17.3.1.1 Conventions

The use case modeling technique is used for capturing business and data requirements relative to Retail Demand Response. There are two basic diagrams used in this document. The first one is the use case diagram, which shows the scope of business use cases for a given business scenario. The relationships used in the use case diagrams are as follows:

- Include: this indicates additional scenarios
- Extend: this indicates alternatives scenarios
- Generalization (line with triangle head): this indicates variations (sub-types) of the main use case.
- Precedes: this indicates a time sequence
- Invokes: this indicates a pre-condition or dependency

The second is the sequence diagram, which shows the information exchange flows between actors for a given use case. The message flows are shown in one way with the convention of verb and noun, verb indicating the action being taken, noun indicating the name of the information being exchanged. The return message flow is the acknowledgement of the main message flow.

REQ.17.3.1.2 ACTORS

The actors listed in the table below are specific to these is Model Business Practices s and are a subset of the actors and related objects defined in REQ.15 WEQ-000. Details on the relationships between the actors and related objects are further defined in Appendix A.



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Table 1 - Actor Roles

Term	Actor ID ¹
Communication Method	5.5
Control	5.2
Designated Dispatch Entity	3.4
Designated Dispatch Entity (DDE)	3.4
End Device (ED)	4.5
Enrollment	5.3
Environmental Authority (EA)	1.3
Federal Regulator (FR)	1.1
Load Serving Entity	3.2
Load Serving Entity (LSE)	3.2
Local Authority (LA)	1.5
Market Participant (MP)	2.2

¹ The Actor ID shown in the table refers to the item number of the corresponding actor or related object in the Entity-Relationship Diagram provided in Appendix A. Definitions of the actors and related objects are included in REQ.17.2

Late Comments Submitted by D. Pratt, J. Phillips and B. Bartell



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Term	Actor ID ¹
Measurement	5.1
Metering Authority	3.6
Metering Authority (MA)	3.6
P-Node	5.6
~~Premise~~ <u>Service Location</u>	4.3
Reliability Authority (RA)	1.2
Resource	4.1
Scheduling Entity	3.3
Scheduling Entity (SE)	3.3
~~Service Provider~~	~~3.1~~
Service Provider (SP)	3.1
State Regulator (SR)	1.4



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Term	Actor ID ¹
System Operator	2.1
Transmission/Distribution Service Provider	~~3.5~~
Transmission/Distribution Service Provider (TDSP)	3.5
Utility Customer (UC)	2.4
Utility Distribution Operator (UDO)	2.3
Zone	5.4

REQ.17.3.1.3 Use Case Overview

Similar to the Wholesale Demand Response use cases, Retail Demand Response use cases generally follow five main steps, see the Figure 1².

1. Administrate DR Program
2. Administrate Customer for DR
3. Administrate DR Resource
4. Execute DR Event
5. Post DR Event Management

There are many programs that exist in today's retail markets with or without open competition. New programs will be defined and deployed in the future. The goal of this use case analysis is to find commonalities among these

² DR program administration related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from the final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the customer enrollment and DR program administration related business practices.



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programs so that the derived DR signal messaging specification can be implemented to support a large number of DR programs.

The focus of the Standardized DR Signals is the step 4, Execute DR Event, where the DR signals will be communicated between the DR Providers and the DR resources. All other use cases are supporting materials to ensure that DR use case requirements are documented and understood in a complete picture.

The use cases included in this document are not intended to be required or exhaustive and are provided for clarification-informational purposes.

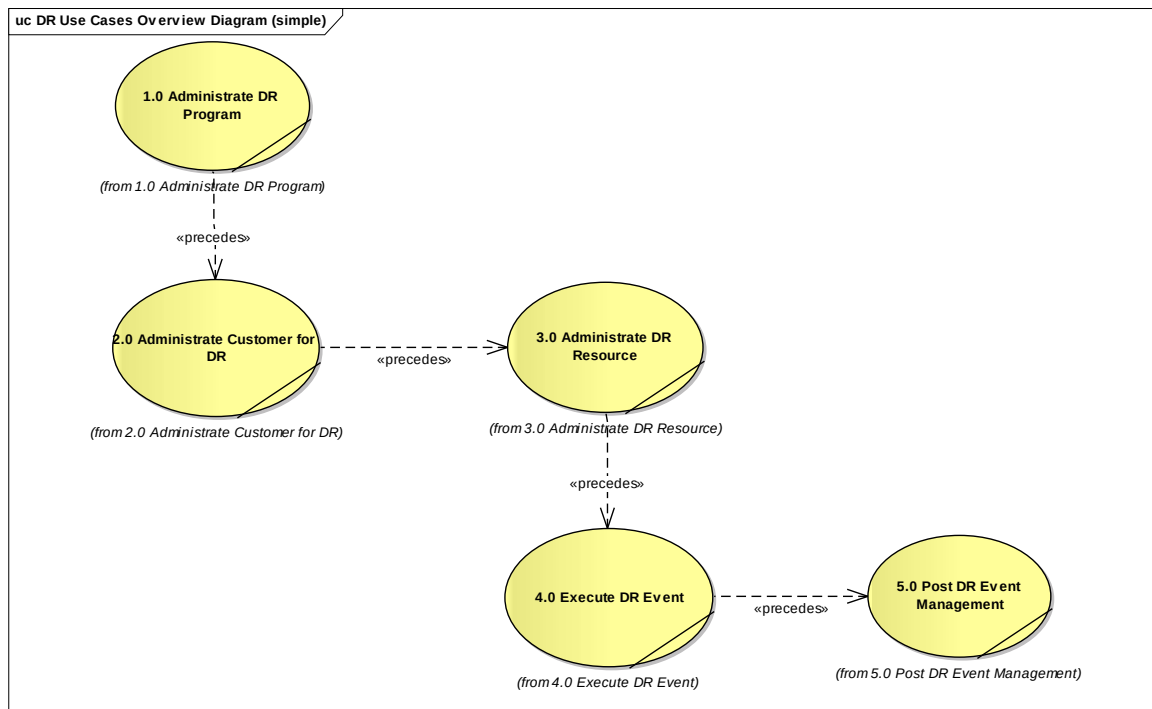


Figure 1. Retail Market DR Use Case Overview



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REQ.17.3.1.42 **Specific Use Cases** (Note: the following terms are defined herein and are in addition to those listed as technical definitions in REQ.17.2.B)

REQ.17.3.1.42.1 Administrate DR Program

DR program administration related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from the final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the customer enrollment and DR program administration related business practices.

REQ.17.3.1.42.2 Administrate Customer for DR

DR program customer enrollment related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from the final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the customer enrollment and DR program administration related business practices.

REQ.17.3.1.42.3 Administrate DR Resource

DR Resource is an equivalent of Resource defined in the actor list table.

As part of enrolling customers to a DR program, specific DR resources and assets that are associated with customers' accounts and premises will also need to be registered. Figure 4 shows the actors and use cases involved in administrating DR resources and/or assets into DR programs. The following use cases deal with the registration, update, and removal of DR resources and assets associated with a customer. When updating DR resources, there will also be potential use cases of DR bidding process, either for supplying or for buying power. There are also cases where Distributed Energy Resources will act as DR assets.



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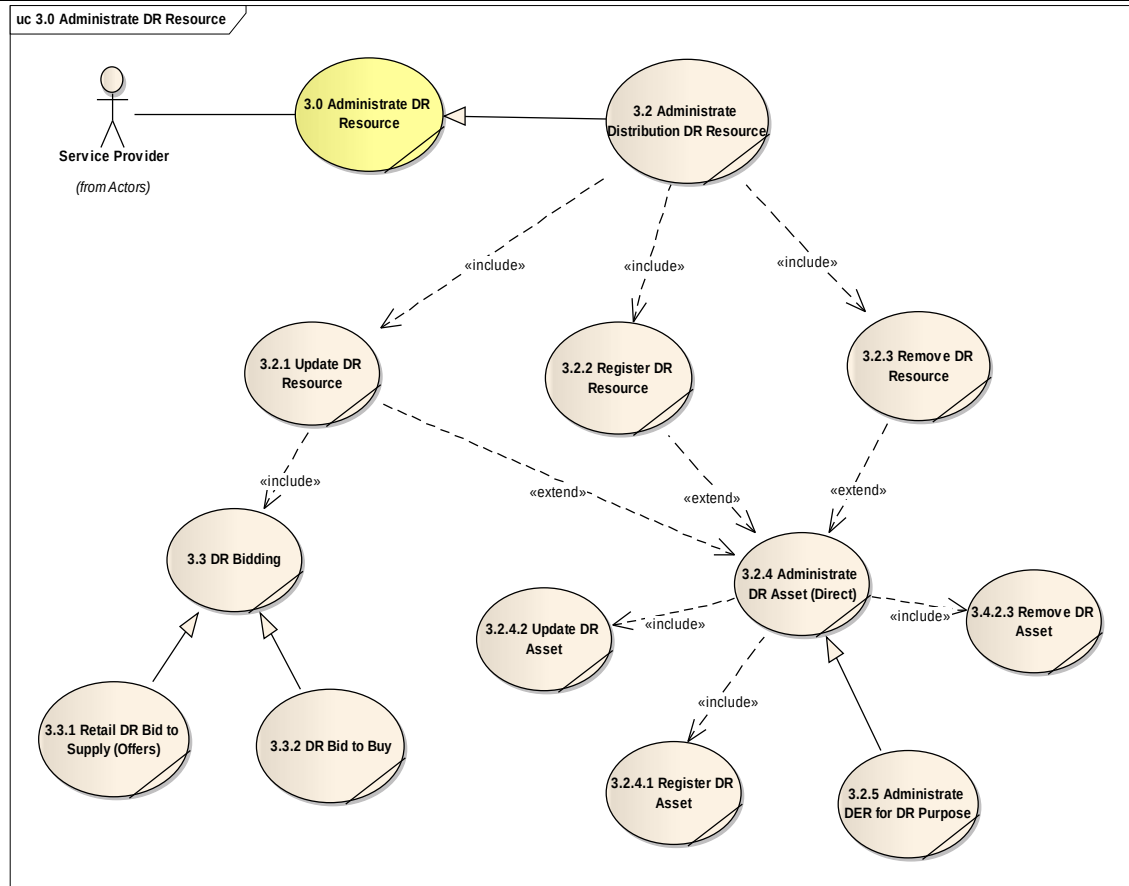


Figure 2. Administrate DR Resources and/or Assets into DR Programs

REQ.17.3.1.42.3.1 Administrate Distribution DR Resource

These activities are used to administer all of the DR Resources and Assets, including a variety of activities surrounding the registration of DR Resources and the management of information surrounding the DR Resources that a Service Provider may call upon during a DR event. Before a DR Resource may be called upon, it must be registered with the Service Provider. The administration of a DR Resource covers the following requirements:

- The need of the Service Provider to identify a DR Resource for communications purposes;
- The need of the Service Provider to establish DR Resource accounts for accounting purposes;
- The need of the Service Provider to collect information from DR Resources prior to DR events for the purposes of determining which DR Resources to call upon during a DR



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Event; and

- The need of the Service Provider to collect information from DR Resources prior to DR events for the purposes of determining the nature of the DR signals to send to the DR Resources.

REQ.17.3.1.42.3.2 Update DR Resource

REQ.17.3.2.3.2.1 Description

When the base capacity of a DR Resource changes from when it was last registered with the DR provider, customer needs to provide updated information to the DR provider so that such information can be factored into the consideration for DR event planning.

REQ.17.3.2.3.2.2 Data Requirements Elements³

Attribute Name	Description
<u>Resource ID</u>	<u>Identifier assigned to the Resource</u>
<u>Resource Type</u>	<u>Type of Resource. Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, and storage.</u>
<u>Transmission/Distribution Service Provider Account Number</u>	<u>Transmission/Distribution Service Provider's (Utility) account number for the Resource.</u>
<u>Demand Response Provider</u>	<u>The entity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response products.</u>
<u>DR Resource Group ID</u>	<u>Grouping of Resources that can respond to the same DR Signal.</u>
<u>Program Identifier</u>	<u>The identifier of the program</u>
<u>Constraint Type</u>	<u>Type of operational, schedule or offer constraint</u>
<u>Constraint Interval</u>	<u>The timeframe over which the constraint type applies.</u>
<u>Constraint Value</u>	<u>Value of the Constraint Type and Interval</u>

³ Except as otherwise footnoted, the Data Elements defined are contributed from the work of: Piette, M.A., G. Ghatikar, S. Kiliccote, E. Koch, D. Hennage, P. Palensky, and C. McParland. 2009. Open Automated Demand Response Communications Specification (Version 1.0). California Energy Commission, PIER Program. CEC-500-2009-063 and LBNL-1779E (<http://openadr.lbl.gov/pdf/cec-500-2009-063.pdf>).



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<u>Attribute Name</u>	<u>Description</u>
<u>Effective Enrollment Date</u>	<u>Effective Start Date for the Enrollment</u>
<u>Location</u>	<u>The location of a Resource defined by one or more of the following attributes:</u>
<u>Location Attributes</u>	
<u>Service Location ID</u>	<u>Identifier assigned to the Service Location</u>
<u>Address1</u>	<u>Address line 1</u>
<u>Address2</u>	<u>Address line 2</u>
<u>City</u>	<u>City</u>
<u>State/Province</u>	<u>State or Province two-letter code</u>
<u>Zip/Postal Code</u>	<u>Zip or Postal Code</u>
<u>Country</u>	<u>Country</u>
<u>GPS Coordinates</u>	<u>LatitudeLatitude and longitude</u>
<u>Weather Station</u>	<u>Weather Station code associated with the Service Location</u>
<u>Zone ID</u>	<u>Identifier assigned to the Zone in which the Service Location is located</u>
<u>Zone</u>	<u>Name of the Zone in which the Service Location is located</u>
<u>Electrical Node ID</u>	<u>Identifier assigned to the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Name</u>	<u>Name of the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Type</u>	<u>Type of Electrical Node at which the Service Location is attached</u>
<u>PNode</u>	<u>Name of the Price Node associated with the Service Location</u>
<u>PNode ID</u>	<u>Identifier assigned to the Price Node associated with the Service Location</u>
<u>End of Location Attributes</u>	
<u>Response Time</u>	<u>The amount of time before an asset/resource is capable of meeting its full performance, in response to a request by a Service Provider to shed load or generate power.</u>
<u>Capacity Type</u>	<u>Type of Capacity</u>

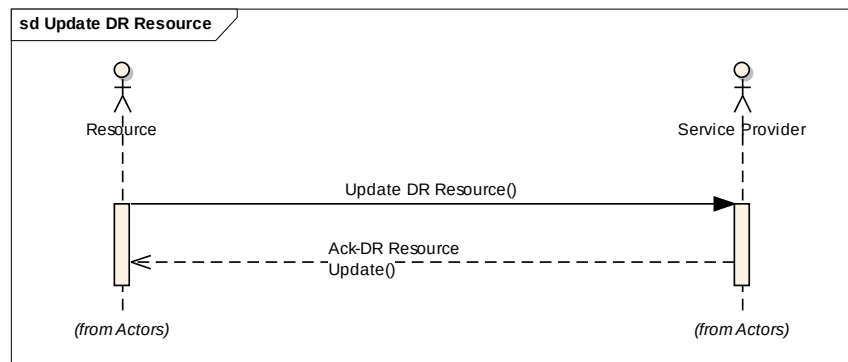


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Attribute Name	Description
<u>Capacity Type description</u>	<u>Description of the Type of Capacity</u>
<u>Nominal Capacity</u>	<u>Nominated load</u>
<u>Offer Commit Status.</u>	<u>Commitment status of offer</u> <u>Product-specific commitment status types included with offer.</u> <u>Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc.</u> <u>Also referred to as "opt-in" or "opt-out" for existing Demand Response Programs.</u>
<u>Resource Type</u>	<u>Type of Resource</u> <u>Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.</u>
<u>Resource Qualification Test Date</u>	<u>Date the Resource demonstrated its ability to deliver a product or service</u>
<u>Requalification Test Date</u>	<u>Date the Resource will retest its ability to deliver a product or service</u>
<u>Enrollment End Date</u>	<u>Date of Termination of Enrollment</u>
<u>Enrollment Status</u>	<u>Status of the Enrollment for the Resource</u>

Sequence Diagram



REQ.17.3.1.42.3.3 Register DR Resource

REQ.17.3.2.3.3.1 Description



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

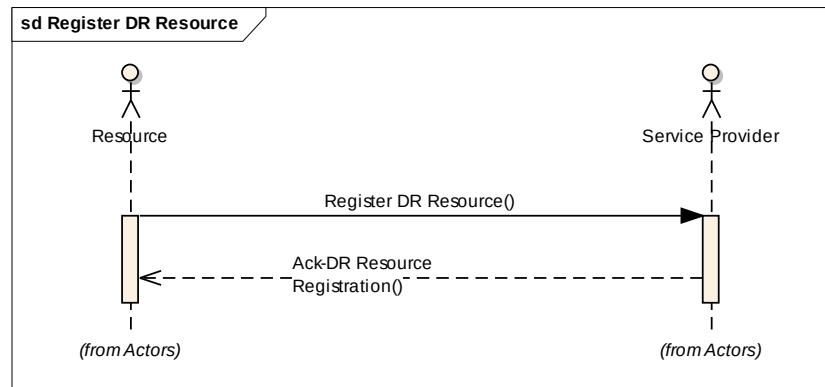
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A party with ownership, controlling interest, or administrative responsibilities for a DR Asset or DR Resource that communicates status-related operational information about the DR Asset or DR Resource to a Service Provider. For example, the owner of a DR Resource or Asset may wish to declare their inability to shed load (an outage) due to summer shutdown or may wish to reduce the available capacity of a resource/asset due to equipment maintenance or other causes.

REQ.17.3.2.3.3.2 ~~Data Requirements Elements~~

The ~~Data Requirements Elements~~ are the same for Register / Enroll DR Resource and Update DR Resource.

Sequence Diagram



REQ.17.3.1.42.3.4 Remove DR Resource

REQ.17.3.2.3.4.1 Description

When a DR resource is no longer available permanently for DR purpose, it needs to be removed from the DR program for that customer so that it will be accounted for DR event planning.

REQ.17.3.2.3.4.2 ~~Data Requirements Elements~~

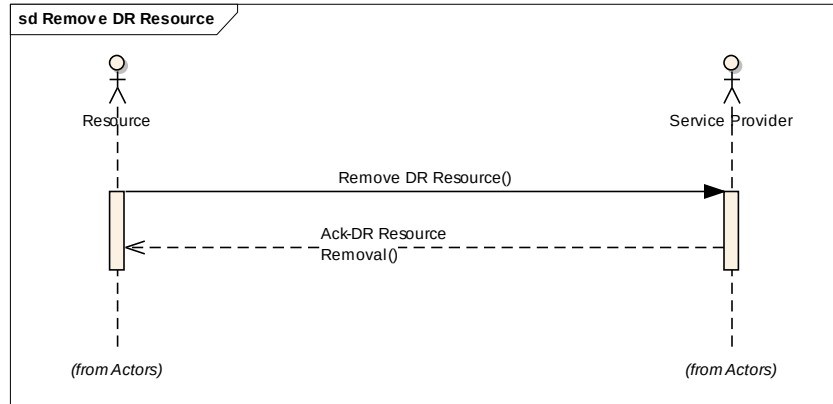
Attribute Name	Description
<u>Resource ID</u>	<u>Identifier assigned to the Resource that is removed.</u>
<u>Program Identifier</u>	<u>The identifier of the program</u>
<u>Enrollment End Date</u>	<u>Date of Termination of Enrollment</u>
<u>Enrollment Status</u>	<u>Status of the Enrollment for the Resource (Set to 'REMOVE')</u>



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Sequence Diagram





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REQ.17.3.1.42.4 Administrate DR Asset (Direct)

REQ.17.3.1.42.4.1 Register DR Asset

REQ.17.3.2.4.1.1 Description

The DR Asset registration process must capture key identifiers to enable accurate tracking of DR assets and their capabilities. A requirement for a System and Market Operator, Load Serving Entity, Service Provider, or other entity facilitating the registration process (hereinafter referred to as DR Asset Administrator) is to track assets. This is done through DR asset registration and association of physical DR assets to DR Resources to recognize the asset and its potential contribution as part of a DR Resource. The DR Asset Administrator ultimately administers the DR Asset registration process to recognize DR Assets that can serve as part of a DR Resource, although the Customer may be party to the registration process.

REQ.17.3.2.4.1.2 Data Requirements Elements

<u>Attribute Name</u>	<u>Description</u>
<u>Asset ID</u>	<u>The unique identifier of the asset</u>
<u>Program Identifier</u>	<u>The identifier of the program</u>
<u>DR Asset Group ID</u>	<u>Grouping of Assets that can respond to the same DR Signal within a DR Resource. (See DR Resource Specification)</u>
<u>Asset Operator ID</u>	<u>The identifier of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.</u>
<u>Asset Operator Name</u>	<u>The name of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.</u>
<u>Asset Owner ID</u>	<u>The Identifier of the business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).</u>
<u>Asset Owner Name</u>	<u>The Name of business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).</u>
<u>Location</u>	<u>The location of a Resource defined by one or more attributes:</u>
<u>Service Location ID</u>	<u>Identifier assigned to the Service Location</u>
<u>Address1</u>	<u>Address line 1</u>



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<u>Attribute Name</u>	<u>Description</u>
<u>Address2</u>	<u>Address line 2</u>
<u>City</u>	<u>City</u>
<u>State/Province</u>	<u>State or Province two-letter code</u>
<u>Zip/Postal Code</u>	<u>Zip or Postal Code</u>
<u>Country</u>	<u>Country</u>
<u>GPS Coordinates</u>	<u>Latitude and longitude</u>
<u>Weather Station</u>	<u>Weather Station code associated with the Service Location</u>
<u>Zone ID</u>	<u>Identifier assigned to the Zone in which the Service Location is located</u>
<u>Zone</u>	<u>Name of the Zone in which the Service Location is located</u>
<u>Electrical Node ID</u>	<u>Identifier assigned to the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Name</u>	<u>Name of the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Type</u>	<u>Type of Electrical Node at which the Service Location is attached</u>
<u>PNode</u>	<u>Name of the Price Node associated with the Service Location</u>
<u>PNode ID</u>	<u>Identifier assigned to the Price Node associated with the Service Location</u>
<u>Effective Enrollment Date</u>	<u>Effective Start Date for the Enrollment (Registration)</u>
<u>Enrollment Status</u>	<u>Status of the Enrollment for the Asset</u>
<u>Offer Commit Status</u>	<u>Commitment status of offer</u> <u>Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc.</u> <u>Also referred to as "opt-in" or "opt-out" for existing Demand Response Programs.</u>
<u>DR Asset Physical Capabilities</u>	<u>Asset Capabilities include Ramp Rates and Capacity.</u>
<u>Ramp Rate Value</u>	<u>Ramp Rate associated with the selected Ramp Rate Type for the selected Ramp Rate Segment and Ramp Rate Direction</u>
<u>Capacity Type</u>	<u>Type of Capacity</u>

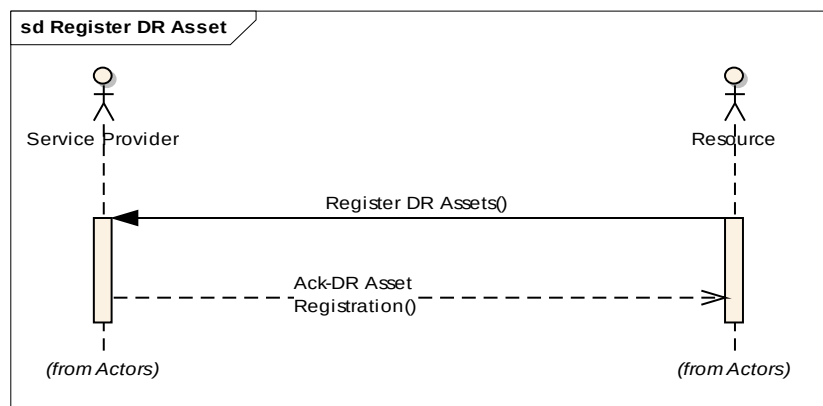


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Attribute Name	Description
<u>Capacity Type description</u>	<u>Description of the Type of Capacity</u>
<u>Nominal Capacity</u>	<u>Nominated load</u>
<u>Asset Manufacturer</u>	<u>Manufacturer of the Asset</u>
<u>Asset Model</u>	<u>Model Identifier of the Asset assigned by the Manufacturer</u>
<u>Asset Version</u>	<u>Model Version Identifier assigned by the Manufacturer.</u>
<u>Asset Manufacture Date</u>	<u>Date of Manufacture of the Asset</u>
<u>Asset Type</u>	<u>Type of Asset.</u> <u>Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.</u>
<u>DR Resources</u>	<u>The identifier of DR resources that the DR Assets belong to. An Asset can associate with multiple Resources, but with only one Resource for a DR Program.</u>

Sequence Diagram





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REQ.17.3.1.42.4.2 Update DR Asset

REQ.17.3.2.4.2.1 Description

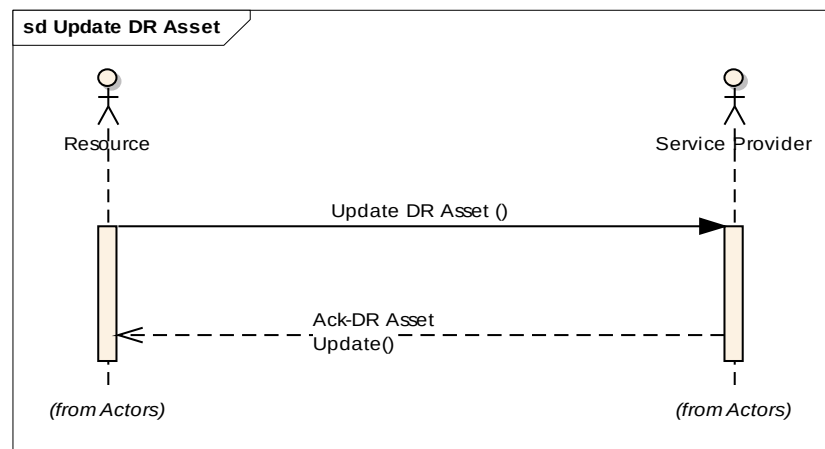
Once a DR asset registration is completed, changes to elements of the registration may be required or desired. After identifying the specific required modification and verifying the authorization to perform the update, each of the considerations identified in the DR Asset registration step should be evaluated and utilized, where necessary, during the update of the DR Asset information. The ability to update DR Asset information helps to ensure the asset information on record is current and complete.

Parties that are privy to and rely on the update should be notified of updates as soon as practicable after they are made. Additionally, these parties should have access to review and, in some cases, to approve/disapprove the update(s).

REQ.17.3.2.4.2.2 Data RequirementsElements

The Data RequirementsElements are the same for Register / Enroll DR Asset and Update DR Asset.

Sequence Diagram





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REQ.17.3.1.42.4.3 Remove DR Asset

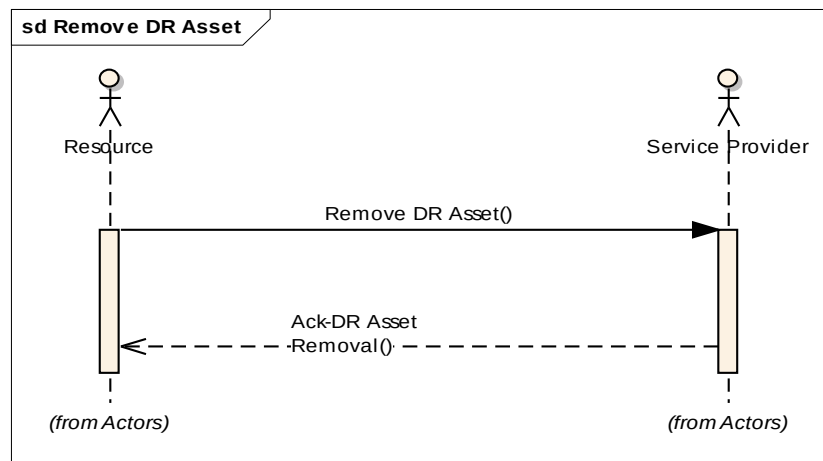
REQ.17.3.2.4.3.1 Description

Removing a DR Asset must take into account any DR Resource long term commitments in System Operator programs and contractual obligations with Service Providers or Load Serving Entities. In addition, applicable regulatory agency filings and approvals must be considered prior to removing a DR Asset from a DR program.

REQ.17.3.2.4.3.2 Data Requirements Elements

Attribute Name	Description
Asset ID	The unique identifier of the asset
Program Identifier	The identifier of the program
Enrollment End Date	Date of Termination of Enrollment
Enrollment Status	Status of the Enrollment for the Asset ('REMOVE')

Sequence Diagram





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REQ.17.3.1.42.5 DR Bidding

Description

Demand Response Bidding occurs after the DR Assets and Resources that are to comprise the desired bid have been registered and a bid or an offer is to be formed. The DR Bidding use case has two sub-use cases, depending on the type of bid to be developed for submission: a bid to supply (i.e., an offer), or a bid to buy. The entity operating the DR bidding program (the Bid Receiver) receives bids from participants (the Bidders). The Bidder may be a Customer bidding with either an energy retailer (e.g., LSE, ESP), a Service Provider (e.g., CSP, DRP), or a power marketer (i.e., wholesale market participant). The Bidder may also be a Service Provider bidding up to a LSE or power marketer.

Before the start of the bidding process, it is assumed that DR Resources available for selection are already registered to provide the physical resource participating in the DR Bidding program. It is also assumed that the bidder has already registered to bid with the bid receiver and has been informed on the appropriate timing and parameters for bid participation. The DR bidding process starts with the decision of the Bidder to develop a bid for submission. The Bidder submits its bid to the Bid Receiver within the appropriate time window and following set guidelines for bidding. The Bidder receives information on the outcome of the submitted bid from the Bid Receiver, who notifies of the bid outcome (e.g., a resource award or other DR commitment).

Examples of retail DR Bidding programs include:

- Demand Bidding
- Capacity Bidding

REQ.17.3.1.42.5.1 DR Bid to Supply (Retail Offers)

REQ.17.3.2.5.1.1 Description

The Bid Receiver opens the forum/venue for receiving an offer. (This may include initiating the bidding process by sending initial information to Bidders indicating parameters of acceptability for bids to be made). The Bidder communicates an offer to supply a specified product/service and the pricing or other incentive structure the bidder is willing to accept for DR. (This may be as simple as the customer sending a response back to the Bid Receiver that accepts or rejects the initial bid sought, or may involve more complex bid structuring).



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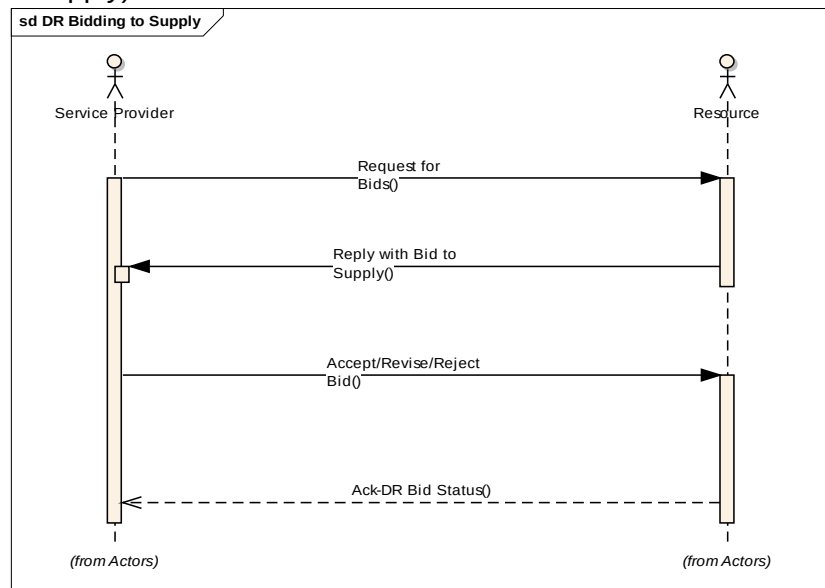
Each offer will have a clearly specified product or service that is being bid and the pricing/incentive structure being offered. The bidder also nominates the amount of and nature of supply being offered, the DR Resource to physically provide the service, and other physical parameters affecting resource availability and capability, in addition to the identity (or ID) of the bidder and resource(s) that comprise the bid.

The Bid Receiver reviews bids (offers) received and clears them, notifying the bidders of the outcome.

The Bidder receives the notification of awards or resource commitments and uses the information internally in preparation for DR Resource Dispatch.

REQ.17.3.2.5.1.2 Sequence Diagram

(Note, the Bid in the following ingign sequence diagram is an offer to supply)





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REQ.17.3.1.42.5.2 DR Bid to Buy

REQ.17.3.2.5.2.1 Description

The Bid Receiver opens the forum/venue for receiving a bid. (This may include initiating the bidding process by sending initial information to Bidders indicating parameters of acceptability for bids to be made). The Bidder communicates a bid to buy a specified product/service and the pricing or other incentive structure the bidder is willing to pay to avoid DR. (This may be as simple as the customer sending a response back to the Bid Receiver that accepts or rejects the initial bid sought, or may involve more complex bid structuring).

Each bid will have a clearly specified product or service that is being bid for purchase and the corresponding pricing structure that is acceptable to the Bidder. The Bidder also includes the quantity of product/service in the bid to buy, and specifies any DR Resource(s) that can physically substitute for the product/service in the event the bid to buy is not cleared (i.e., the bidder is unwilling to pay more than the going/market outcome price for the product/service). Other information submitted include physical parameters affecting resource availability and capability, in addition to the identity (or ID) of the bidder and resource(s) that comprise the bid.

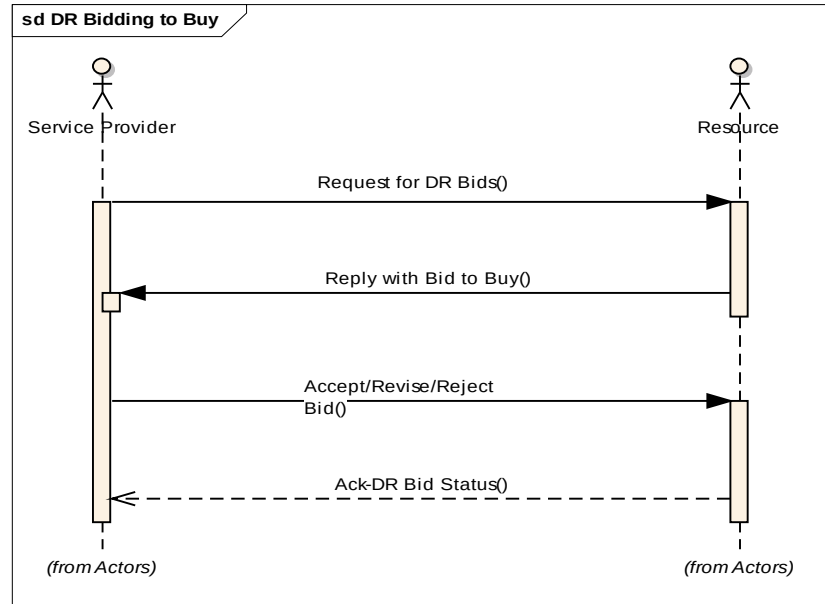
The Bid Receiver reviews bids received and clears all bids, notifying the bidders of the outcome. The Bidder receives the notification of resource commitments and uses the information internally in preparation for DR Resource Dispatch.



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REQ.17.3.2.5.2.2 Sequence Diagram





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REQ.17.3.1.42.6 Execute DR Event

The execution of a DR event takes different forms depending on operational situation and the type of DR programs being executed. Typically, they fall into one of the following four use cases, see Figure 5:

1. Advanced DR Notification
2. Broadcast DR Message (price plus information)
3. DR dispatch instruction
4. DR direct load control.

Operational considerations for DR event execution are also associated with DR programs where direct load control or dispatching instructions are carried out.

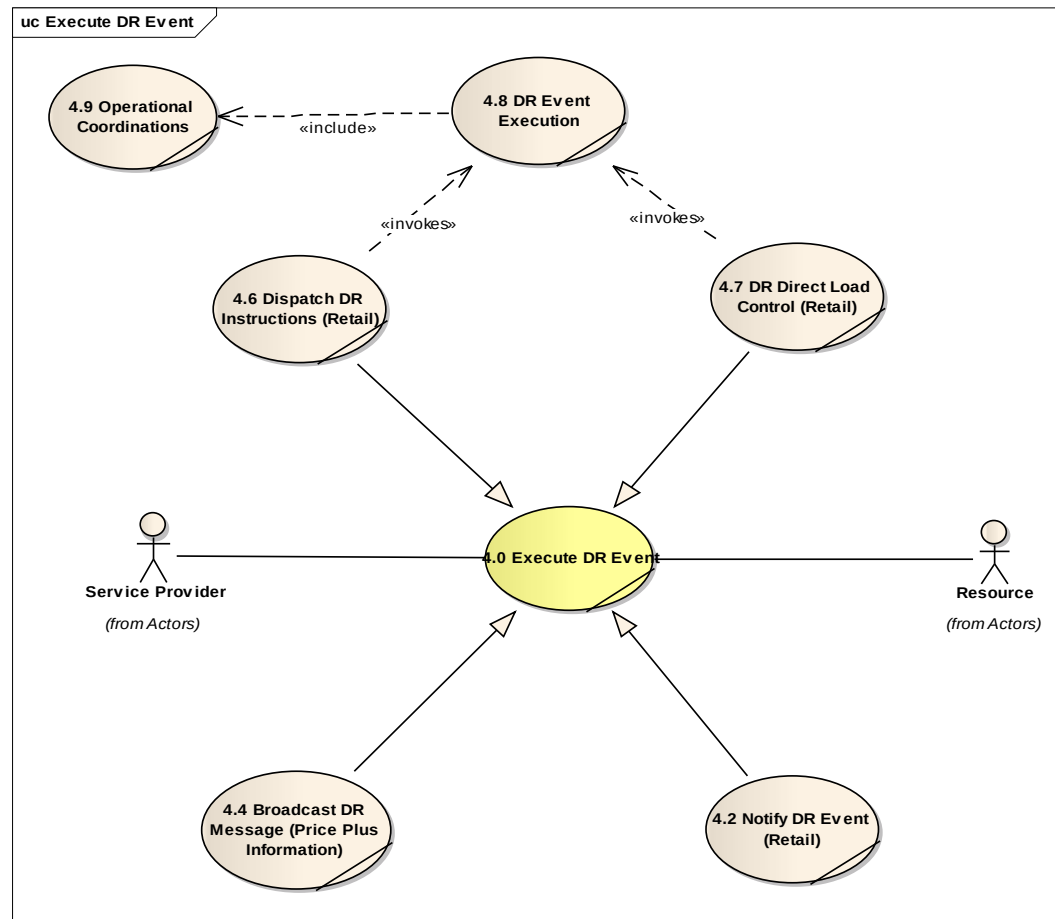


Figure 5. Execute DR Events



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REQ.17.3.1.42.7 Notify DR Event (Retail)

REQ.17.3.1.42.7.1 Advanced Notification for DR (Retail)

REQ.17.3.2.7.1.1 Description

This is used by the Service Provider to send the DR Event notification (i.e., DR signal) to the DR Resource.

The Notify DR Event Message applies to one of three types:
Broadcast DR Message (Price Plus Information)
Dispatch DR Instructions for Objectives (Retail)
DR Direct Load Control (Retail).

The message content specific to each of these types is defined in their respective sections below.

REQ.17.3.2.7.1.2 Data RequirementsElements

The following are the data elementsrequirements that are common to all of the Event Message Types.

<u>Attribute Name</u>	<u>Description</u>
<u>Program ID</u>	<u>Program Identifier</u>
<u>Program Name</u>	<u>Name of the Program</u>
<u>Service Provider ID</u>	<u>Identifier assigned to the Service Provider</u>
<u>Event ID</u>	<u>Identifier assigned to the Event</u>
<u>Event Modification Number</u>	<u>A modification number for the DR event. This is used to indicate if the DR Event has been modified by the Utility. Each time it is modified, this number is incremented.</u>
<u>Area of Event Notice Applicability:</u> <u>The area affected by the Demand Response Event can be defined by a Location attribute (point location or area) or is applicable to a Resource or to an Asset for Direct Load Control.</u>	
<u>Resource ID</u>	<u>Identifier assigned to the Resource</u>
<u>Asset ID</u>	<u>The unique identifier of the asset</u>
<u>Location can be identified by any of the following:</u>	
<u>Service Location ID</u>	<u>Identifier assigned to the Service Location</u>
<u>Address1</u>	<u>Address line 1</u>
<u>Address2</u>	<u>Address line 2</u>
<u>City</u>	<u>City</u>
<u>State/Province</u>	<u>State or Province two-letter code</u>
<u>Zip/Postal</u>	<u>Zip or Postal Code</u>



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<u>Attribute Name</u>	<u>Description</u>
<u>Code</u>	
<u>Country</u>	<u>Country</u>
<u>GPS Coordinates</u>	<u>Latitude</u> Latitude and longitude
<u>Weather Station</u>	<u>Weather Station code associated with the Service Location</u>
<u>Zone ID</u>	<u>Identifier assigned to the Zone in which the Service Location is located</u>
<u>Zone</u>	<u>Name of the Zone in which the Service Location is located</u>
<u>Electrical Node ID</u>	<u>Identifier assigned to the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Name</u>	<u>Name of the Electrical Node at which the Service Location is connected</u>
<u>Electrical Node Type</u>	<u>Type of Electrical Node at which the Service Location is attached</u>
<u>PNode</u>	<u>Name of the Price Node associated with the Service Location</u>
<u>PNode ID</u>	<u>Identifier assigned to the Price Node associated with the Service Location</u>
<u>The following are other attributes applicable to all DR Event Messages.</u>	
<u>Deployment Type</u>	<u>Type of Deployment.</u> <u>Examples are: Advanced (Normal), Immediate, Audit/Test.</u>
<u>Simple Signal Levels</u>	<u>Used as an alternate and simplified representation of the DR signal, whether it be price based or a dispatch. Takes on a small number of finite levels such as NORMAL, MODERATE, and HIGH, SPECIAL</u>



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Attribute Name	Description																																				
Criticality Level	This field defines the level of criticality of this event. The action taken by load control devices for an event can be solely based on this value, or combination with other Load Control Event fields supported by this device. For example, additional fields such as Average Load Adjustment Percentage, Duty Cycle, Cooling Temperature Offset, Heating Temperature Offset, Cooling Temperature Set Point or Heating Temperature Set Point can be used in combination with the Criticality level. <table><tr><th>Criticality Level</th><th>Level Description</th><th>Participation</th></tr><tr><td>0</td><td>Reserved</td><td></td></tr><tr><td>1</td><td>Green</td><td>Voluntary</td></tr><tr><td>2</td><td>1</td><td>Voluntary</td></tr><tr><td>3</td><td>2</td><td>Voluntary</td></tr><tr><td>4</td><td>3</td><td>Voluntary</td></tr><tr><td>5</td><td>4</td><td>Voluntary</td></tr><tr><td>6</td><td>5</td><td>Voluntary</td></tr><tr><td>7</td><td>Emergency</td><td>Mandatory</td></tr><tr><td>8</td><td>Planned Outage</td><td>Mandatory</td></tr><tr><td>9</td><td>Service Disconnect</td><td>Mandatory</td></tr><tr><td>0x0A to 0x0F</td><td>Utility Defined</td><td>Utility Defined</td></tr></table>	Criticality Level	Level Description	Participation	0	Reserved		1	Green	Voluntary	2	1	Voluntary	3	2	Voluntary	4	3	Voluntary	5	4	Voluntary	6	5	Voluntary	7	Emergency	Mandatory	8	Planned Outage	Mandatory	9	Service Disconnect	Mandatory	0x0A to 0x0F	Utility Defined	Utility Defined
Criticality Level	Level Description	Participation																																			
0	Reserved																																				
1	Green	Voluntary																																			
2	1	Voluntary																																			
3	2	Voluntary																																			
4	3	Voluntary																																			
5	4	Voluntary																																			
6	5	Voluntary																																			
7	Emergency	Mandatory																																			
8	Planned Outage	Mandatory																																			
9	Service Disconnect	Mandatory																																			
0x0A to 0x0F	Utility Defined	Utility Defined																																			
Baseline Dates	Dates of days used to calculate the Energy Baseline																																				
Baseline Exclusion Dates	Dates of days Excluded from the calculation of the Energy Baseline																																				
Energy Baseline Value	Calculated Energy Baseline																																				
Energy Baseline Timestamp	Timestamp of Energy Baseline																																				
Deployment Period (Interval): The deployment period that is communicated to a Resource or Asset is an interval contained within the Start or End Time of the Event, but not necessarily for the entire Event.																																					
Event Start Time	Time of Start of deployment period for Event																																				
Event End Time	Time of End of deployment period																																				

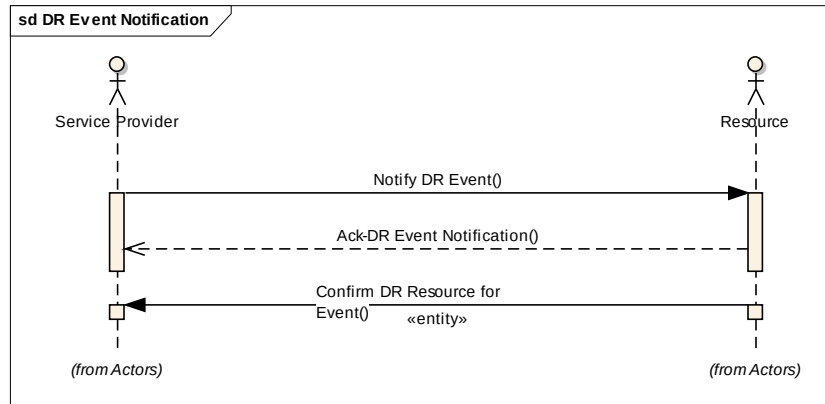
⁴ Requirement as defined by the ZigBee Smart Energy Profile™ 2.0 Technical Requirements Document



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REQ.17.3.2.7.1.3 Sequence Diagram





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REQ.17.3.1.42.7.2 Update a DR Event (Retail)

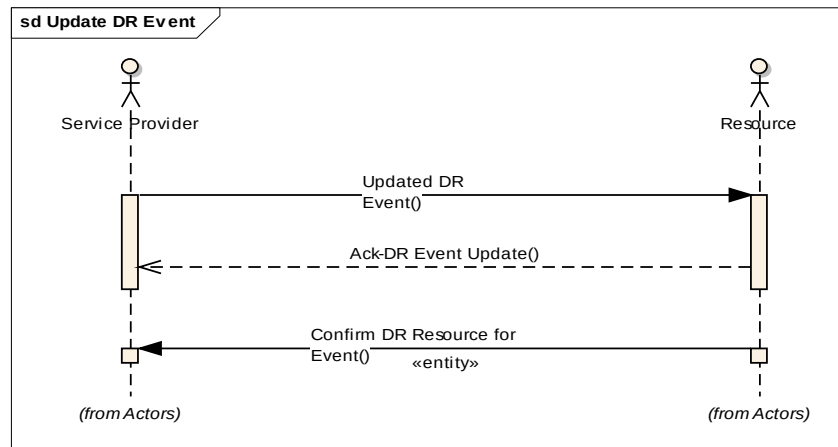
REQ.17.3.2.7.2.1 Description

This is used to update a DR event that has been previously notified. The requirements for this use case are the same as those for the "Advanced Notification for DR" use case.

REQ.17.3.2.7.2.2 Data Requirements Elements

Attribute Name	Description
<u>Event</u>	<u>See the "Advanced Notification for DR" use case.</u>
<u>Event Modification Number</u>	<u>This is Modification number of the DR event. It is used to indicate that the DR Event has been modified by the Utility or Service Provider. Each time a DR Event is modified, this number is incremented.</u>
<u>Modification reason code</u>	<u>The reason the event was modified.</u>

REQ.17.3.2.7.2.3 Sequence Diagram





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REQ.17.3.1.42.7.3 Cancel a DR Event (Retail)

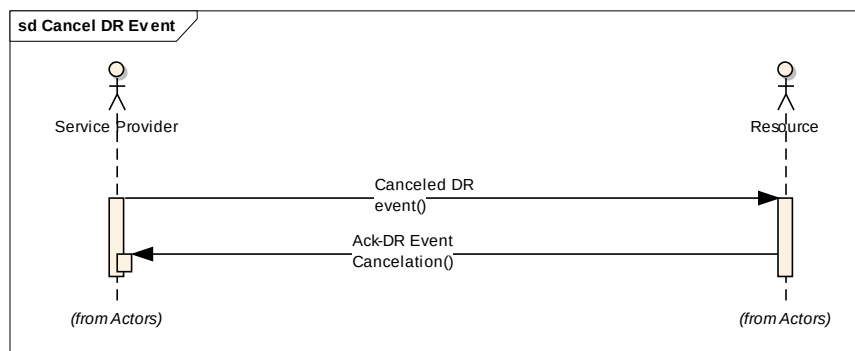
REQ.17.3.2.7.3.1 Description

This is used by the Service Provider to notify the DR Resource that a DR Event is being cancelled. It should only be executed if a DR Resource has previously received notification of a DR Event and that event has subsequently been cancelled.

REQ.17.3.2.7.3.2 Data Requirements Elements

Attribute Name	Description
<u>Modification reason code</u>	<u>The reason the event is being cancelled.</u>
<u>Event Status</u>	<u>Status of the Event</u>
<u>DR Event Identifier</u>	<u>An identifier for the event that is being cancelled.</u>
<u>Effective date/time</u>	<u>The date and time a cancellation takes effect.</u>

REQ.17.3.2.7.3.3 Sequence Diagram





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REQ.17.3.1.42.7.4 DR Resource Confirmation (Retail)

REQ.17.3.2.7.4.1 Description

This is a confirmation message that is sent by a DR Resource to the Service Provider as a result of receiving a DR Signal from the Service Provider. It may be used as an acknowledgement of the receipt of the DR signal, but it may also contain various information used to signify how the DR Resource will respond to the DR Signal.

Any changes to the Resource or Asset that may impact participation or performance for the Event (such as Location and Load Profile) shall should be provided through the Update Resource or Update Asset Messages.

REQ.17.3.2.7.4.2 Data RequirementsElements

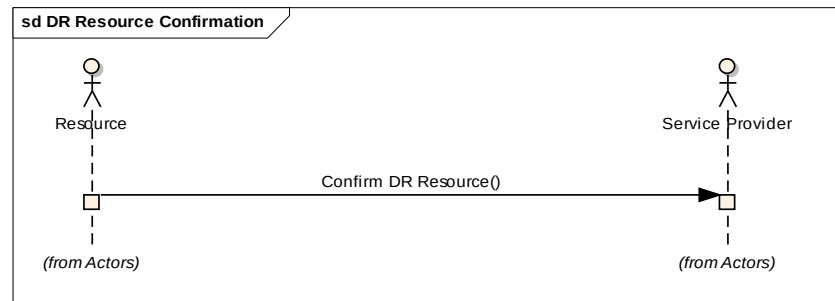
Attribute Name	Description
Resource ID	Identifier assigned to the Resource
Asset ID	The unique identifier of the asset
Exception Conditions	This is used to report that the load controller may not behave as commanded because of a variety of conditions including: - Faults in device - Customer override.
Load Control State	The state of the load, which includes both commanded states and user settings. This may include a schedule of future states if a particular control algorithm for the load controller is being executed.
Operational Constraints	Operational Constraints at run time may differ from those provided at Enrollment, and will be applicable only to the time interval of the Event for this Resource or Asset.
Constraint Type	Type of operational, schedule or offer constraint
Constraint Interval	The timeframe over which the constraint type applies.
Constraint Value	Value of the Constraint Type and Interval
Offer Dispatch Status	Dispatch Status of Offer a.k.a. as "Opt-in" or "Opt-out" in existing programs.



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REQ.17.3.2.7.4.3 Sequence Diagram



REQ.17.3.1.42.8 Broadcast DR Message (Price Plus Information)

REQ.17.3.2.8.1 Description

Demand Response programs are designed to address different power system concerns caused by the imbalance between generation, transmission and consumption, or environmental concerns. Some DR programs are conducted on a voluntary basis, where the customer can opt to maintain the level or load. Some DR programs are mandatory, where either the customer loads will be curtailed under certain conditions or the customer will incur financial penalties for noncompliance.

In retail market, certain "DR Messages" can be broadcasted to DR resources either directly or through Service Providers. DR Message is defined as information about the DR signals that may affect the demand behaviors of the energy consumers. Obviously, the main component of the DR Message is the pricing information. However, there are other attributes of energy being delivered that may be of interest to energy consumers and could be included in the DR Message.

Based on the OpenADR discussion, the broadcasting function is mainly used for volunteer or non-mission critical DR messages. Therefore, message acknowledgement or confirmation is optional.

REQ.17.3.2.8.2 DR Source of Power/Generation

"DR Message" also can be source of power or generation. ANSI C12.19-2008 defined the following source of power/generation in Standard Table 12.

Precondition:

The DR Service Provider sends the DR message to service providers. In the case of DR pricing, the DR Service Provider calculates the price



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per location and communicates the appropriate price associated with the DR product to service providers.

Post Condition:

DR Resources received the DR pricing information, and may or may not act based on the DR agreement or contract.

REQ.17.3.2.8.3 Data Requirements Elements

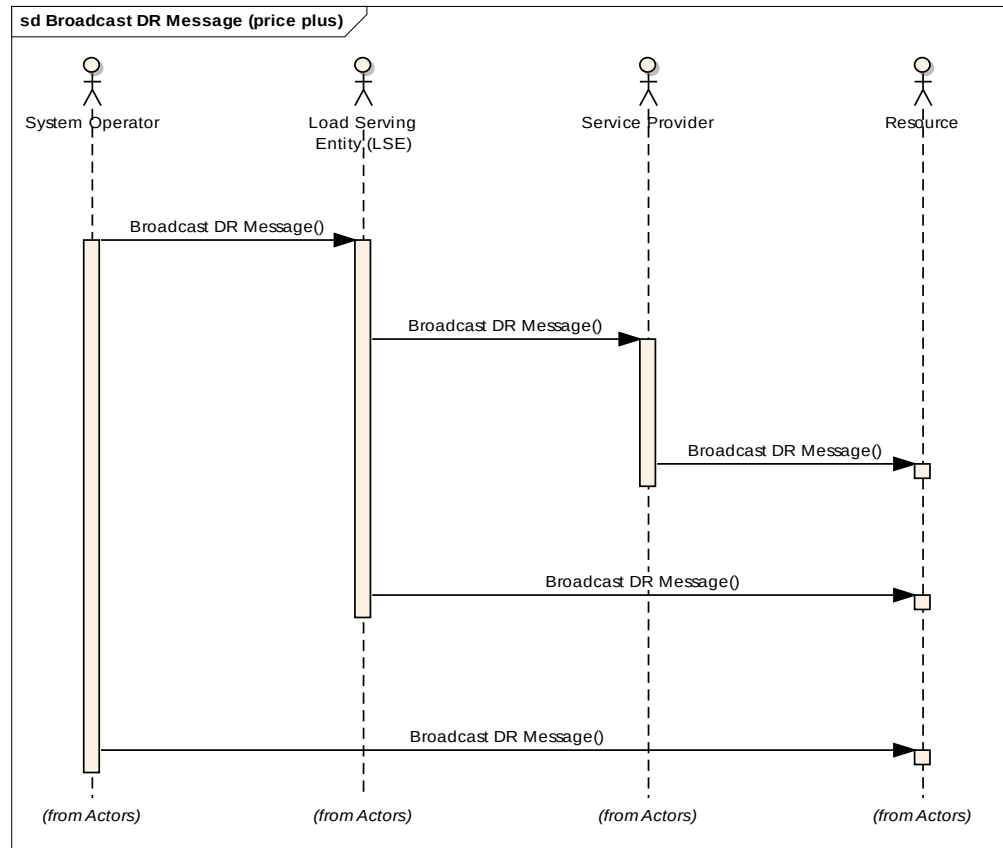
<u>Attribute Name</u>	<u>Description</u>
<u>Currency</u>	<u>Economic unit of exchange in which the total price and price components are stated (e.g. dollars, euros)</u>
<u>Product Price</u>	<u>The sum of all Price Component Values for a given product (Total Price).</u>
<u>Product Price Factor</u>	<u>Terms of use attribute of Product Price Examples: Price absolute, Price relative, Price multiplier</u>
<u>Unit of Measure</u>	<u>Attribute of Product Identifier</u>
<u>Delivery Time</u>	<u>Time at which the product is available for physical consumption</u>
<u>Delivery Interval</u>	<u>The duration over which the product is available for physical consumption</u>
<u>Market Product (Product Type)</u>	<u>Market Product Product types include the following: energy, capacity, regulation, operating reserves (spinning or non-spin).</u>



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REQ.17.3.2.8.4 Sequence Diagram



REQ.17.3.1.42.9 Dispatch DR Instructions (Retail)

REQ.17.3.2.9.1 Description

This interaction is used to dispatch DR Resources. This type of interaction is used when the Service Provider needs to achieve specific objectives from the DR Resources during DR events. This means that specific instructions will be given to the DR Resource with objectives (e.g. shed 100 kW) for the load profile of the DR Resource.

Note that for the retail use cases, a Dispatch is considered a special type of DR Notification, and thus, it is very similar in nature to the requirements given for that interaction.



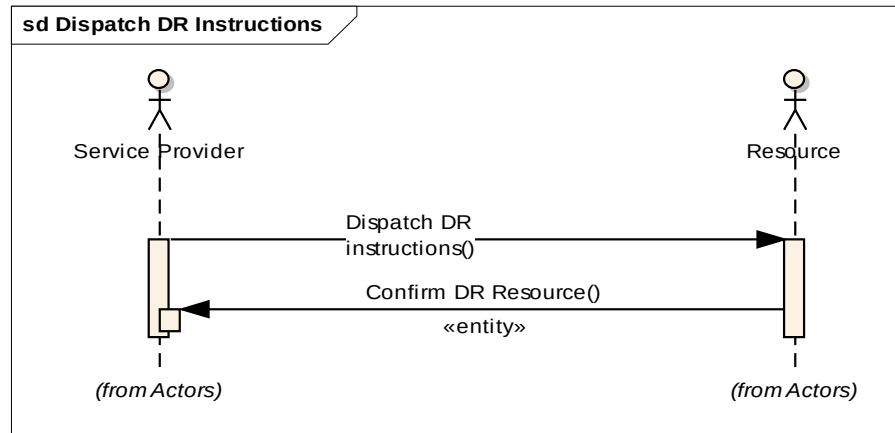
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REQ.17.3.2.9.2 Data Requirements Elements

Attribute Name	Description
DR Dispatches for DR Objective based messages are of three types. • <u>LOAD LEVEL</u> • <u>LOAD AMOUNT</u> • <u>LOAD PERCENTAGE</u>	
For Load Level: <u>Load Level Value</u>	<u>Value of the load level to be achieved based on a set of enumerated values.</u> (e.g. moderate, high, etc)
For Load Amount: <u>Deployment MW</u>	<u>Deployment quantity expressed as an Absolute</u>
For Load Percentage: <u>Deployment MW</u>	<u>Relative Deployment quantity expressed as %.</u>

REQ.17.3.2.9.3 Sequence Diagram



REQ.17.3.1.42.10 DR Direct Load Control (Retail)

REQ.17.3.2.10.1 Description

This use case covers direct interactions between the DR Service Provider and a specific DR Asset for the purposes of putting that asset into a specific load control state (e.g., to turn it on or off). In this case, the DR Asset is a DR Resource with only one DR Asset, and thus, the interaction is directly with the DR Asset.

See REQ.17.3.1.42.11.3, DR Execution - Direct Load Control (DLC) for more details.



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REQ.17.3.2.10.2 Data Requirements Elements

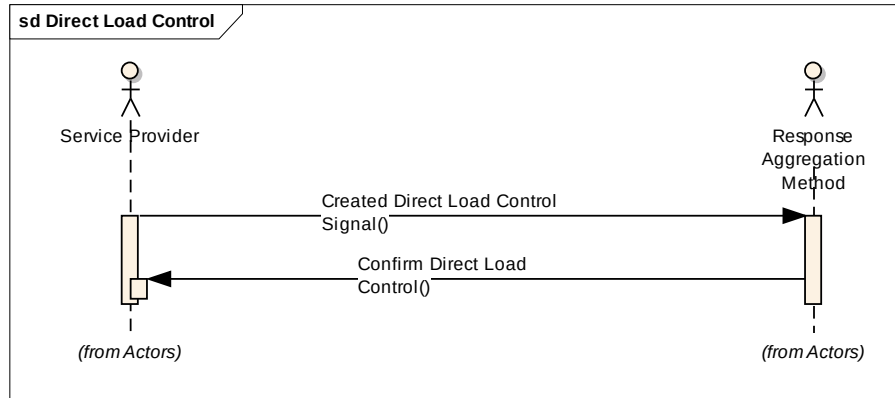
Attribute Name	Description
<u>Asset ID</u>	The unique identifier of the asset (Note: Direct Load Control messages are applicable only to Assets)
<u>Status Check</u>	A signal to require the DR resource status to be sent back. (Only applicable to Direct Load Control)
<u>DR Control Command: Direct Load Control Type</u>	The type of DR Direct Load Control Command: e.g. Set Point, Open/Close, Heating Temperature - offset/setpoint, Cooling Temperature - offset/setpoint, Load adjustment offset
<u>DR Control Command: Direct Load Control Value</u>	Value associated with the Direct Load Control Type.
<u>Event Start Time</u>	Time of Start of deployment period for Event
<u>Event End Time</u>	Time of End of deployment period
<u>Duty Cycle</u>	"Duty Cycle : Defines the maximum On state duty cycle as a percentage of time. Example, if the value is 80, the device would be in an "on state" for 80% of the time for the duration of the event. Range of the value is 0 to 100. A value of 0xFF indicates the field is not used." (from SEP2.0) ^{4???}
<u>Event Control</u>	Event Control options for randomized start or end times: 1= Randomize Start time, 0=Randomized Start not Applied 1= Randomize End time, 0=Randomized End not Applied. (from SEP2.0) ^{4???}
<u>Device Class</u>	Enumeration representing the Device Class to apply the current Load Control Event. ^{4???}

REQ.17.3.2.10.3 Sequence Diagram



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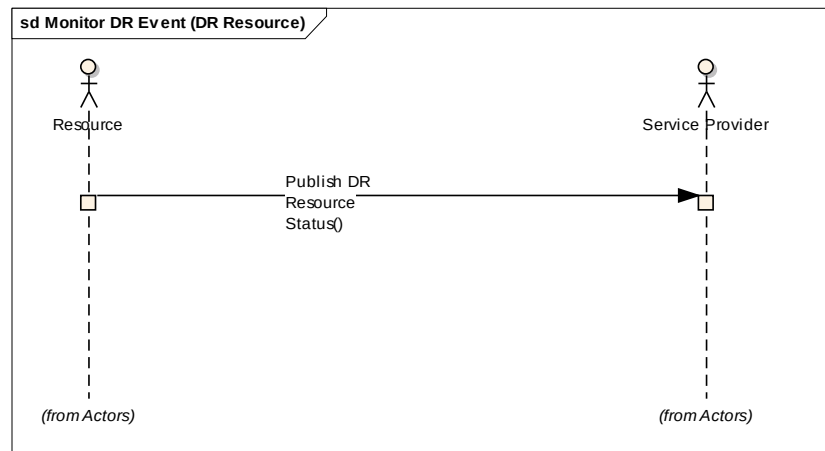
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REQ.17.3.2.11 REQ.17.3.1.4.10.1 Monitor DR Event (DR Resource)

REQ.17.3.2.11.1 Description

This interaction is used to monitor a DR Resource's behavior. It may be executed as a result of the DR Resource receiving a DR signal or it may be conducted continuously.

REQ.17.3.2.11.2 Sequence Diagram

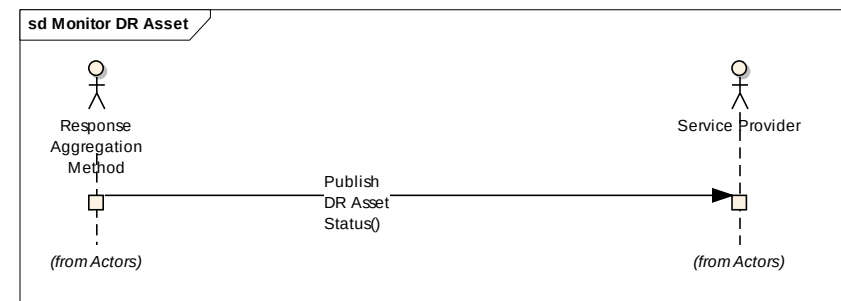


REQ.17.3.2.12 REQ.17.3.1.4.10.2 Monitor DR Event (DR Asset)

REQ.17.3.12.1 Description

This interaction is used to monitor the state of a DR Asset. It may be executed as a result of the DR Asset receiving a DR signal or it may be conducted continuously.

REQ.17.3.12.2 Sequence Diagram





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REQ.17.3.2.13~~REQ.17.3.1.4.11~~ DR Event Execution

Demand Response is deployed for economic or a reliability purposes. At high penetration levels, demand response ~~has to~~should be integrated with the power supply scheduling process, and it may impact the distribution grid operation and reliability, and perhaps the transmission grid operation and reliability. Thus it is important to include the required considerations for the grid and system level operations when developing DR Use Cases and DR signal standards. Such impacts may not be significant at low penetration levels; however, proper considerations ~~must~~should be given to support scalability and expandability for future deployments.

Power system operates based on a real-time balancing of supply and demand. To economically schedule the supply, an accurate load forecast is needed. Traditionally, load forecast was generated using the historical consumption patterns, weather forecast and other similar parameters. With the potential of high-penetration of DR, it ~~will~~may be necessary to incorporate the planned or forecasted DR levels into the load forecast. Also, DR capabilities can be used to support the power system capacity or emergency supply (ancillary service) needs. Such services ~~require~~depend upon proper scheduling and monitoring capabilities.

A demand response event may be initiated by a power system operator in response to a reliability event, e.g., loss of a generating station causing a lack of supply to meet demand, or an uncontrolled set of PEVs overloading of a distribution transformer. A demand response event may also be initiated by utility operational systems based on economic considerations, e.g., reducing or shifting peak load at the system level or at specific feeder or facility. Demand response may also be initiated by a customer in response to a market pricing signal

~~Considering that~~Ithe distribution grid in the US is typically a three-phase imbalance circuit, i.e., many customers are on a single-phase or two-phase of the three-phase system. Thus significant changes in customer load patters could result in undesirable imbalanced conditions on a feeder. Also, load pickup following the termination of a major DR event could possibly cause overloads and other operational problems, if the load pickup is not properly scattered/managed.



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The following provides three representative use cases to highlight some the key interactions. These include:

- Dynamic Price-based DR
- Notification-based DR
- Direct Load Control

REQ.17.3.12.13.1 REQ.17.3.1.4.11.1 DR Execution – Retail Time Pricing (RTP)

REQ.17.3.2.13.1.1 Description

~~Provide r~~Real-time or dynamic pricing (RTP) may be provided to retail customers so that customers can vary their demand based on pricing signals. RTP represents retail electricity rates that vary as a function of time

Traditionally, retail tariff has based on a fixed or tiered rate structure with possible considerations of static rates for pre-established time of use (TOU) conditions. Real time or dynamic pricing (RTP) represent retail electricity rate that could vary as a function of time and is intended to modify demand. It requires interval metering for accurate billing based on time-varying prices. A number of states have implemented RTP or other dynamic pricing tariffs for large customers. With a broader deployment of advanced meters, RTP rates may become more common nation-wide.

The scenario presented here represents a case where a location-dependent real-time retail pricing for energy is established based on the Locational Marginal Price (LMP) for that location. LMP values are typically established by an ISO (for regions covered by an ISO/RTO) on a day-ahead (hourly resolution) and real-time basis, typically on a five minute resolution. For the RTP, it may be appropriate to use the real-time LMP as the basis for computing the retail dynamic tariff. However, decisions should be made on the time and the spatial resolution of the RTP. For example, an hourly RTP averaging the five minute pricing values, or a Critical Peak Pricing model to reflect the extreme conditions only, may be adopted. In addition to the energy price, the retail RTP rate may also include the appropriate uplift charges to cover for distribution wire/services charges and for the power loss compensations. Note that the uplift charges are typically subject to a regulatory review and approval.

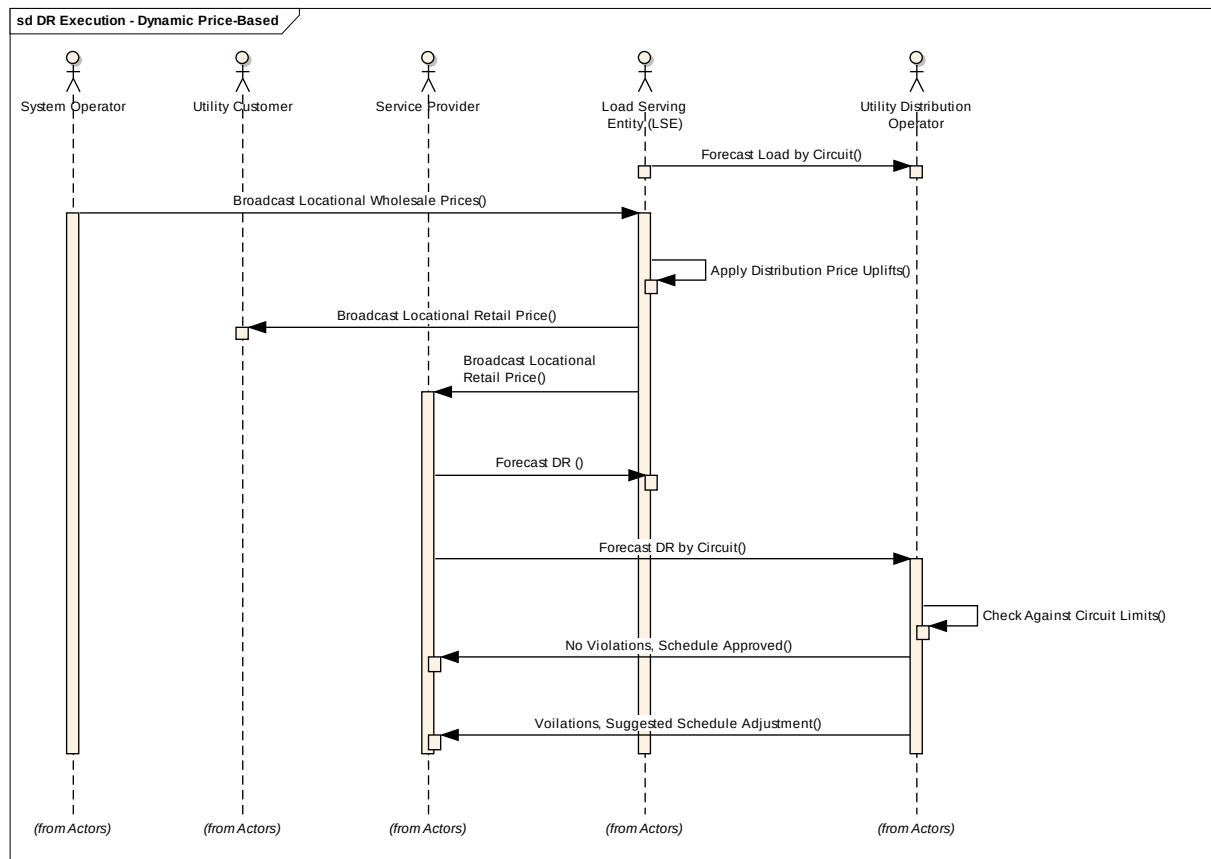


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Special care must be given to the RTP rate design to ensure customer acceptance and adaptation. Also grid operational issues may have to be addressed. For example, during low LMP (RTP) periods (e.g., at night), certain distribution circuits may get over loaded (congested), with customers shifting consumption, e.g., charging PEVs, to that period. This improves the overall system economy, but may cause circuit congestion. To combat this, some have proposed use of demand charges or an additional incentive payment for load reduction, a locational incentive to relief congestion.

REQ.17.3.2.13.1.2 Sequence Diagram





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REQ.17.3.2.13.2 REQ.17.3.1.4.11.2 DR Execution – Notification
Based

REQ.17.3.2.13.2.1 Description

Notification-based DR is mostly used for economic purposes based on a day-ahead or hours or hour-ahead basis. Notification-based DR may also be used for reliability events when the system operator expects a contingency or operating condition (e.g., congestion or planned outage) on the distribution or the transmission grid that requires a reduction (or an increase) on the load at a given location.

Considering that the business processes for demand response have not yet been standardized across the nations, the following is a representative scenario that captures some of the interactions between the key stakeholders (actors).

At high penetration levels, the DR operation, especially on a day-ahead or hour ahead basis, ~~need-should~~ be coordinated with the overall operations and supply scheduling process. As is shown in the Sequence Diagram below, this may require a timely update of the “locational” load forecast and an up-to-date nomination of the DR capabilities. This information may be supplied to the “system” and/or market operator to be incorporated in the overall supply and demand scheduling process. The DR capabilities are specified by the DR Provider to the System Operator based on a DR Program, a price curve, or other nomination protocol. The DR Provider may also inform the Load Serving Entity (LSE) of the locational available DR capabilities.

The notification-based DR dispatch process is typically initiated by the System or Market Operator; the process may also be initiated by an LSE or UDO. It is also possible that the DR Provider be the initiator of the DR process based on a market opportunity (economic operation) or based on a pre-established program.

At high DR penetration levels, it is expected that the DR provider will ~~need-to~~ clear the DR schedule with the Distribution Grid Operator, the UDO. This is to ~~help~~ ensure that the high penetration DR has no adverse impact on the distribution grid reliability and power quality, e.g., cause of excessive imbalances, voltage violation, or an overload during load pickup period. The UDO, in a timely fashion, ~~will-should~~ inform the DR Provider, if the schedule is cleared or requires an adjustment. Please note that if the DR deployed by a



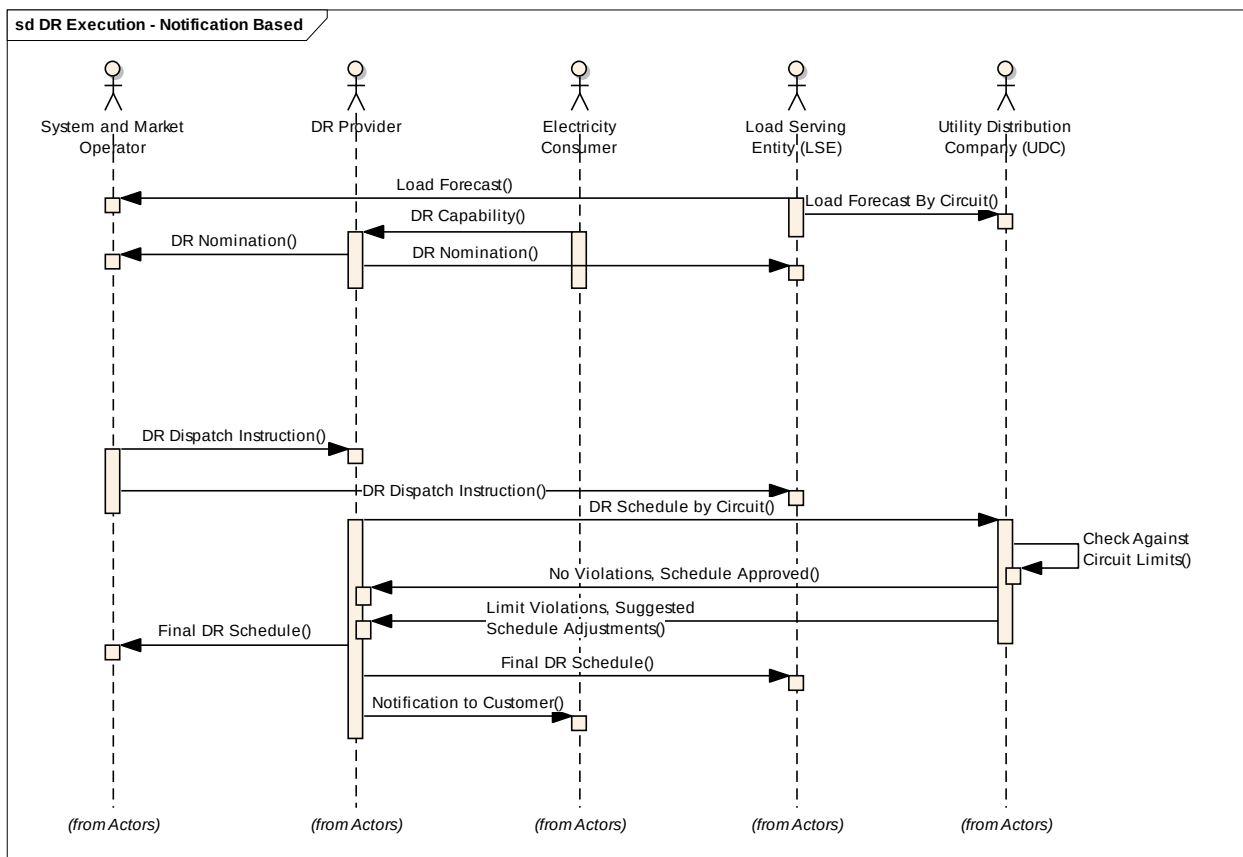
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utility company that includes both LSE and UDO functions, such coordination is typically performed within the company's operational systems (e.g., DRMS, DMS, etc.), or it can be an integral part of the DR scheduling application.

Following the clearing the DR schedule, notifications are sent to customers for DR operation. Under this scenario, the Market Operator and the LSE are also informed of the final DR schedule.

REQ.17.3.2.13.2.2 Sequence Diagram





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REQ.17.3.2.13.3 REQ.17.3.1.4.11.3 DR Execution – Direct Load Control (DLC)

REQ.17.3.2.13.3.1 Description

Direct-Load Control is typically used for reliability-based events such as contingency and emergency support, supply of balancing energy or other ancillary service. Many of these programs may require quick response time, e.g., five minutes or faster, that ~~is practically only possible~~ may be enabled through a DLC capability. Direct-Load Control may also be used for economic operations, e.g., water heater programs to reduce or shift peak load.

Considering that the business processes for demand response have not yet been standardized across the nations, the following is a representative DLC scenario that captures ~~the~~ sample interactions between the key stakeholders (actors).

Direct Load Control is typically called for by a system operator, a transmission or distribution operator. It could be also issued by a Market Operator based on an ancillary service DR award, or by an LSE or DRP for an economic purpose. At high penetration levels, DLC operation ~~needs to~~ should be coordinated with the distribution grid operator, the UDO.

As is shown in the sequence diagram below, the customer DR capabilities are aggregated by location and specified/nominated to the Distribution Grid Operator, Load Serving Entity, and/or to the System/Market Operator. In addition to location, the capabilities may also be aggregated by the DR response time, e.g., four seconds, five minutes, 30 minutes, etc.

The DLC Dispatch process ~~is~~ typically is initiated by the Transmission or Distribution Operator. The process may also be initiated by the Market Operator or the LSE. The actual control of the DR resources may be done by the DR provider based on the dispatch signal received.

At high DR penetration levels, it is expected that the DLC activation schedule to be coordinated with the Distribution Grid Operator, the UDO. This is to help ~~ensure~~ that there are no adverse impact on the distribution grid reliability and power quality, e.g., voltage violation, excessive phase imbalances, or an overload during load pickup period. If the DLC is deployed by a utility company such coordination can be accomplished within the company's DR and distribution management



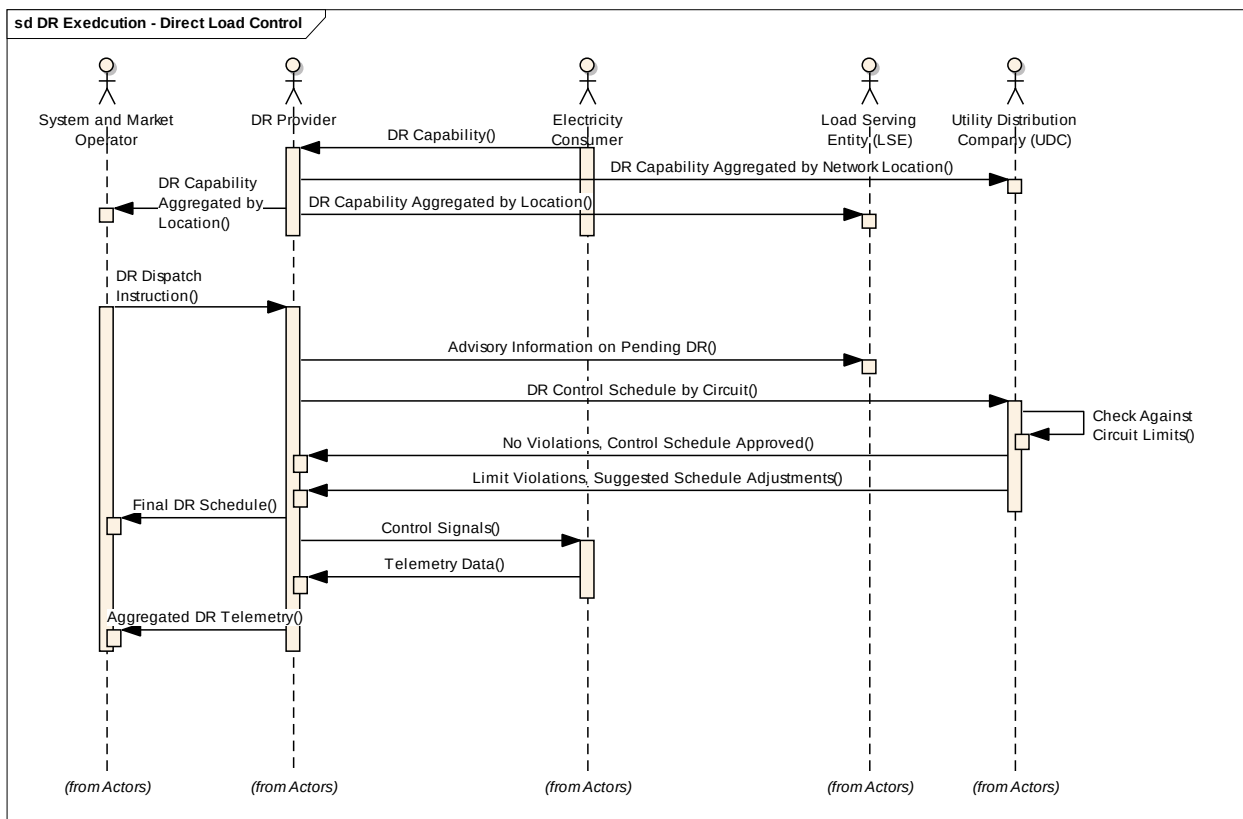
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systems, or performed as an integral part of the DR control functions.

For a “fast” DR, e.g., provision of ancillary services, a telemetry capability is-may be required to enable the real-time monitoring of the resource condition and its response to the DR control signal.

REQ.17.3.2.13.3.2 Sequence Diagram



REQ.17.3.2.14 REQ.17.3.1.4.12 Operational Coordination

Due to the existing differences in the regional retail energy market regulations, wholesale market structure and protocols, and supply and demand conditions, currently there are regional differences in business practices and processes governing demand response. As a result, operational coordination requirements for demand response somewhat-would vary from region to region, depending on the available retail tariff, retail market structure, available wholesale market for DR and the market mechanics.

The following table summarizes the major roles and responsibilities of the typical key stakeholders with respect to demand response



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operation. As can be seen in this table, a significant level of stakeholder coordination is-may be required for an end-to-end DR operation spanning from the wholesale markets to the end-use customers.

Stakeholder	Sample Key Rolesresponsibilities
Wholesale Market Operator	- Establish, administer, and operate wholesale demand response programs and markets; - Determine and publish locational prices for wholesale demand response products; - Improve energy market efficiencies (economics) by integrating demand response products and capabilities; - Monitor compliance to wholesale DR instructions and financially settle with the participating stakeholders.
Transmission Grid / System Operator - Balancing Authority	- Monitor and maintain transmission grid reliability, and call upon wholesale demand-side (demand response) capabilities to address contingency/emergency conditions; - Dispatch demand-side capabilities to balance supply and demand, e.g., mitigating impact of variable generation (e.g., wind). - In regions with no organized wholesale energy market, economically dispatch available generation and demand resources including demand response to optimize supply economics.



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Stakeholder	Sample Key Roles/responsibilities
Distribution Grid Operator – Utility Distribution Company	- Monitor and maintain the distribution grid reliability and the quality of power supply (e.g., voltage levels). Call upon DR to mitigate the distribution contingencies and reliability concerns. - Review and approve the integration of distributed energy resources with the distribution grid. - Assess the operational impact of distributed resources and demand response (DR/DER) on power quality and reliability of the distribution grid, approve high-penetration DR schedules (especially cold-load pickup operation). - Coordinate with the respective Load Serving Entity and Energy Service Providers for the assessment of distribution service and loss compensation charges to retail customers.
Load Serving Entity	- Forecast load and economically schedule supply to meet demand at all times. Incorporate demand response capabilities to improve load factor, reducing/shifting peak load. - Establish and obtain regulatory approval for a ~~fair and unbiased~~ retail tariff for ~~all~~ various customer classes. For real-time dynamic pricing (RTP) tariff, apply distribution service, loss compensation and other uplifts to the wholesale locational prices. - Establish and administer demand response and distributed resource management programs including DR tariff. - Meet regional requirements for Renewable Portfolio Standards compliance for power delivery. - Aggregate and schedule DR capabilities in wholesale markets, manage DR programs. - Manage customer metering and billing process.



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Stakeholder	Sample Key Roles/responsibilities
Power Marketer	- Forecast load and economically schedule supply to meet demand ~~at all times~~. Incorporate demand response capabilities to improve load factor, reducing/shifting peak load. - Establish and obtain regulatory approval for a ~~fair and unbiased~~ retail tariff for ~~all various~~ customer classes. For real-time dynamic pricing (RTP) tariff, apply distribution service, loss compensation and other uplifts to the wholesale locational prices. - Operate a wholesale and/or retail demand response programs with wholesale and/or retail customers.
Energy Service Provider	- Operate only in regions with competitive retail market - Be an alternative supplier of electric power to end-use customers by offering competitive products, services and prices. - Forecast aggregated load of the enrolled customers by location as required. - Coordinate the power supply with the respective LSE and UDO. - Support demand response programs (DR/DER) for enrolled customers. - Aggregate demand and demand-side capabilities; schedule the aggregated load and DR capabilities in wholesale markets. - Provide for DR telemetry and other monitoring requirements, on a resource or aggregated basis. - Apply the necessary uplifts (e.g., distribution service and loss compensation charges) to the wholesale locational prices. ~~Help~~ ~~Meet~~ regional requirements for Renewable Portfolio Standards compliance for power delivery. - Bill and settle with customers for energy supply and DR operation.



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Stakeholder	Sample Key Roles/responsibilities
Demand Response Provider	- Offer ~~competitive~~ demand response services to the end-use customers. - Design and manage DR programs, establish pricing structure and signals for DR operation - Aggregate demand and demand-side capabilities; and offer/schedule these capabilities with the respective LSE or the wholesale market. - Provide for DR telemetry and other monitoring requirements, on a resource or aggregated basis. - Bill and settle with customers for energy supply and DR operation.
Electricity Customer	- Subscribe to a DR program, and update DR availability and capability information as appropriate - Maintain DR resources, data communications, telemetry, metering and control devices as <u>may be</u> required. - Respond to pricing signals, DR notifications, or control signals as appropriate.

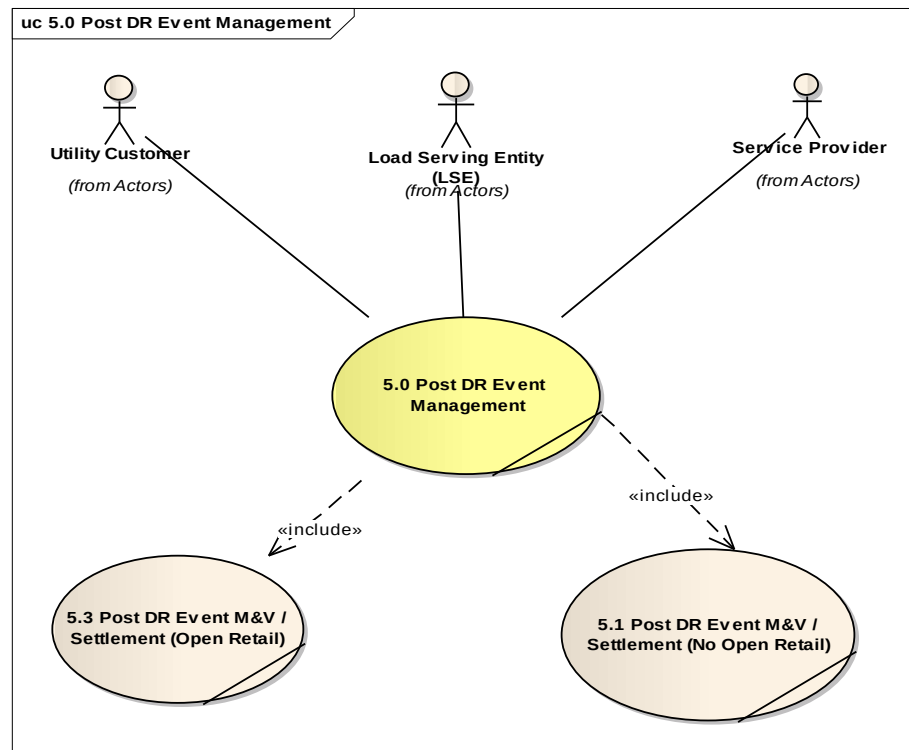


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REQ.17.3.2.15 ~~REQ.17.3.1.4.13~~ Post DR Event Management

Post DR event management mainly concerns with the reconciliation of the actual consumption of energy within the duration of a DR event with the expected behavior so that proper financial reward or penalties could be carried out. ~~The NAESB M&V standard for DR defines the requirements for most of the post event management.~~ The following use cases describe post DR event management for three different market types.





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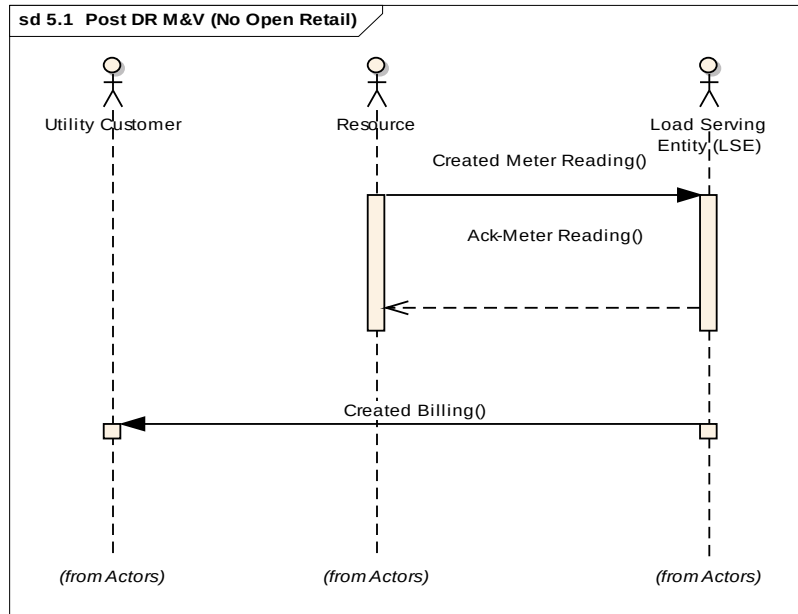
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REQ.17.3.2.15.1 REQ.17.3.1.4.13.1 Post DR Event M&V / Settlement (No Open Retail)

REQ.17.3.2.15.1.1 Description

After DR Event has been completed, then Measurement and Verification (M&V) can confirm whether action has been taken or to measure the impact of the response. After the M&V, then the Financial Settlement is-may be calculated and sent to the Electricity Customer⁵. This Use Case covers the scenarios with no Open Retail Markets.

REQ.17.3.2.15.1.2 Sequence Diagram



⁵ In wholesale markets, the settlement for a DR Event is between the System Operator and Market Participant and possibly between the Market Participant and the Electricity Customer.



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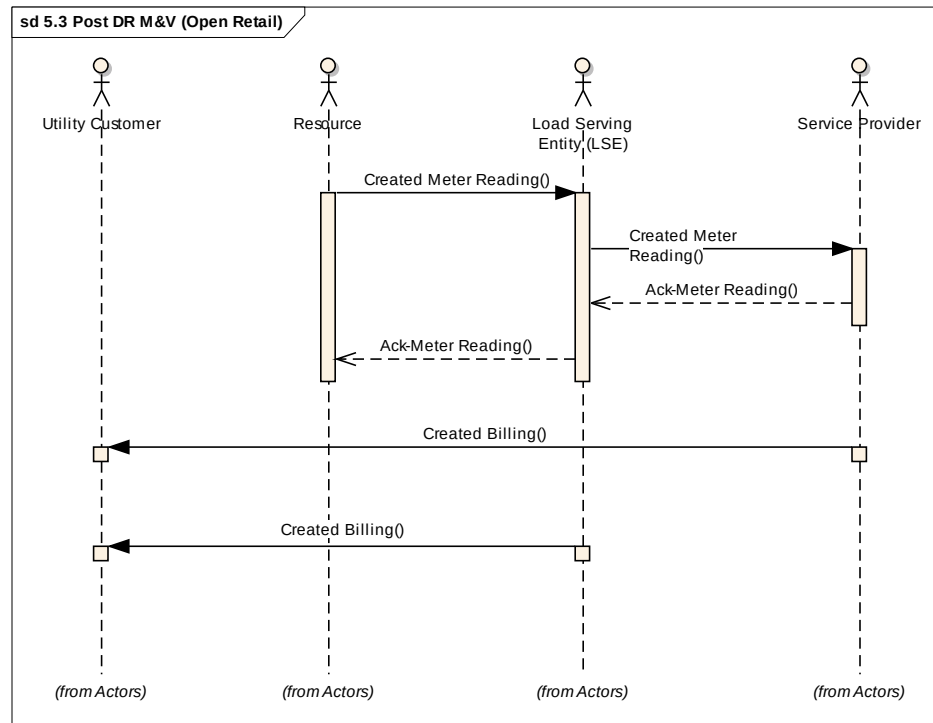
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REQ.17.3.2.15.2 REQ.17.3.1.4.13.2 Post DR Event M&V / Settlement (Open Retail)

REQ.17.3.2.15.2.1 Description

After DR Event has been completed, Measurement and Verification (M&V) can confirm action has been taken or to measure the impact of the response. After the M&V, the Financial Settlement is-can be calculated and sent to the Electricity Customer. This Use Case covers the scenarios with Open Retail Markets.

REQ.17.3.2.15.2.2 Sequence Diagram





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REQ.17-A Appendix A – Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall information model for demand response. Figure 1A contains a data model used to illustrate the entity-relationships within the model. Abbreviations/Acronyms correspond to the IDs shown in the figure.

Proper (and Improper) Usage of the Entity-Relationship Model. The entity-relationship model is used to show cardinality among objects in the model, for example every Resource belongs to one and only one Service Provider and a PremiseService Location contains one or more End-DevicesService Delivery Points. The entity-relationship model does not provide use case information; actors are objects in the model and do not “act” in the model. The entity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the enrollment of those Resources may be managed by a System Operators or a Utility Distribution Operator. Both use cases and process maps are separate components of the Model Business Practices.

Reading Crow’s Foot Notation. Objects in the model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow’s Foot notation, as documents in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a PremiseService Location is related to one-or-more End-DevicesService Delivery Points (reading top to bottom) and every End-DevicesService Delivery Point is related to exactly-one PremiseService Location (reading bottom to top).

~~**Optional Objects.** The entity-relationship model is designed to support multiple business models and not every business model will require all objects to function. Therefore, all objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.~~

Optional Entities, Roles and Objects. The entity-relationship model is designed to support multiple business models and not every business model will require all entities, roles and/or objects to function. Therefore, all entities, roles and objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.

Applicability to Retail and Wholesale. The entity-relationship model is applicable to both wholesale and retail. When using the model for wholesale, the applicable

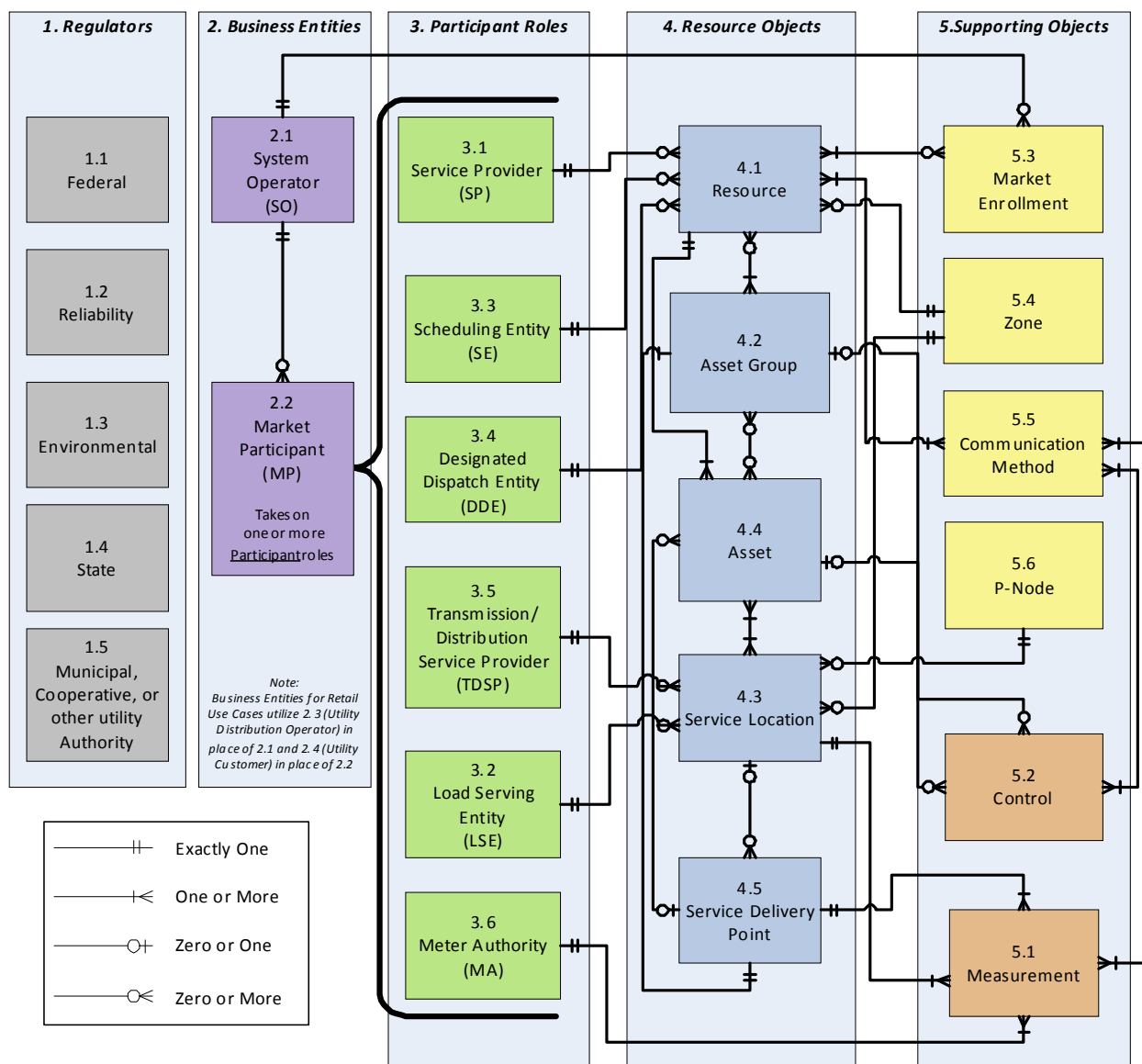


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business entities are 2.1 (System Operator) and 2.3 (Market Participant), while in retail markets, the parallel business entities are 2.3 (Utility Distribution Operator) and 2.4 (Utility Customers). Other than the swapping of the two pairs of terms, the models are identical, including the names of and relationships among objects.

Figure 1A. Sample Entity-Relationship Model for Smart Grid Use Cases





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4. Supporting Documentation

a. Description of Request:

REQ Annual Plan Item 9(c) – “Develop Requirements and Use Cases for PAP 09 – Demand Response/Distributed Energy Resources”

b. Description of Recommendation:

This recommendation provides the data requirements-elements related to the use cases developed as part of the phase one effort

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the development of standard DR and DER signals.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- March 11, 2010 Meeting Notes – To be posted
- March 18, 2010 Meeting Notes – To be posted
- March 25, 2010 Meeting Notes – To be posted
- April 1, 2010 Meeting Notes – To be posted
- April 8, 2010 Meeting Notes – To be posted
- April 29, 2010 Meeting Notes – To be posted
- May 13, 2010 Meeting Notes – To be posted
- May 20, 2010 Meeting Notes – To be posted
- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes – To be posted
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc
- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc



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- September 9, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes – To be posted



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1. RECOMMENDED ACTION:

☒ Accept as requested
☒ Accept as modified below
☐ Decline

EFFECT OF EC VOTE TO ACCEPT RECOMMENDED ACTION:

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☒ Definition
☒ Business Practice Standard Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The business process flows, use cases and data elements presented in this document illustrate the standard interactions between Utility Distribution Operator, Service Provider (Demand Response) and Utility Customer for the administration and deployment of demand response resources for retail markets.

RECOMMENDED STANDARDS:

In response to NIST's Priority Action Plan 9, this document provides elements specifications, in the form of business process flows, use cases and data elements in certain areas, to support the standardization of the information exchange between Utility Distribution Operator, Service Provider (Demand Response) and Utility Customer. This document shares a standard set of actors and terminologies with the companion Requirements Specification for Wholesale Standard DR Signals.



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RECOMMENDED STANDARDS:

Specifications for Retail Standard Demand Response Signals

Executive Summary

The North America Energy Standards Board (NAESB) Smart Grid Standards Subcommittee took the responsibility of consolidating and developing DR use cases that provide specifications for developing DR control and pricing signal standards, which is called for by National Institute of Standards and Technology (NIST) Priority Action Plans (PAP) 03 and 09. This document addresses the business and data specifications for standardizing control and pricing signals for Retail level Demand Response (DR) and Distributed Energy Resources (DER) as part of the Smart Grid implementation. Wholesale market DR and DER information exchanges are outside the scope of this document and are addressed in the Specifications for Wholesale DR signals. The first step of use case development is the development of the Framework for Integrated DR and DER Models document, which provides an overall business context for DR and DER Models.

According to the Framework Document findings:

1. DR signals standardization should support all four market types; i.e. regions with a) no open wholesale and no retail competition, b) open wholesale market only, c) open retail competition only, d) open wholesale and open retail competition. It must also consider key differences that exist and will continue to exist in all four market types.
2. Wholesale market DR and pricing signals have different characteristics than retail market DR and pricing signals, although commonality in format is feasible.
3. Most Customers (with a few exception of Commercial and Industrial (C&I) Customers) will not interact directly with wholesale market when it comes to DR and pricing signals.
4. Retail pricing models are complex, due to the numerous tariff rate structures that exist in both regulated and un-regulated markets. Attempts to standardize DR control and pricing signals must not hinder regulatory changes or market innovations when it comes to future tariff or pricing models.
5. New business entities (Energy Service Providers (ESP), Demand Response Providers (DRP), Service Providers, and Energy Information Service Providers (ESIP)) as well as new customer energy management systems may play an increasing role in DR implementation.
6. DER may play an increasingly important role in DR, yet the development of tariff and/or pricing models that support DER's role in DR is still in its infancy.
7. The Customer's perspective and ability to react to DR control and pricing signals should be a key driver during the development of DR standards.

The following deals exclusively with the retail level demand response signals specifications. The specifications are captured in the form of UML models, where business specifications are captured in Use Case narrative format, data specifications are captured in tabular format, and



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information exchange flows are captured in sequence diagram format. The top level use cases for retail DR are:

1. Administrate DR Program
2. Administrate Customer for DR
3. Administrate DR Resource
4. Execute DR Event
5. Post DR Event Management

The intent is to clearly specify the business information that may be necessary to be exchanged to make effective and reasonable business decisions. Standards or implementations that do not directly use such schemas and element names may conform to these requirements through clearly defined mapping documentation.

Introduction

This Model Business Practice and data elements included herein are not intended to (i) require the use of any of these data elements, (ii) require the provision or purchase of any products, programs, rates, markets or services, or (iii) supersede applicable Governing Documents, and in the event of a conflict, the latter documents shall have precedence over this Model Business Practice.

Purpose: The purpose of the following is to capture business and data specifications for Retail Level DR signals between entities that control and manage the DR programs and entities that provide demand response with DR resources and assets. This is to fulfill the NAESB SGTF responsibility under the NIST Smart Grid Interoperability Standards development PAP09. This requirements document will then be used by other standards development organizations identified by NIST PAP09 for further development of DR signals technical specifications for both C&I customer and residential customer markets.

Scope: The scope of the following is to provide business and data specifications for standardizing Demand Response signals at the retail (distribution) level.

Commentary on Distributed Energy Resources: In the context of this report, Distributed Energy Resources (DER) are dispatchable energy generation and storage technologies, typically up to ten MWs in size, that are interconnected to the distribution grid to provide electric capacity and/or energy to a customer or a group of customers and potentially export the excess to the grid for economical purposes. DER systems can generate electric power, as opposed to curtailable or interruptible loads that can just reduce electric loading on the grid.

DER may be subdivided into distributed generation (DG), distributed storage, and plug-in electric vehicles (PEVs):

Distributed generation (DG) technologies can be divided into a) **Renewable Generation**, e.g., small wind power systems, solar photovoltaic (PV), Fuel Cells, Bio-fuel generators and Digesters, nuclear, hydro and other generation resources using renewable fuel, and b) **Non-**



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Renewable Generation, e.g., micro-turbines, small combustion turbines, diesel, natural gas and dual-fueled engines, etc.

Storage resources could be divided into a) **Electric Storage**, e.g., battery systems and uninterruptible power supplies (UPS), flywheel, superconducting magnetic energy storage (SMES), etc. and b) **Thermal Storage** – These convert electric power to thermal (cooling/heating) energy for later use, e.g., Ice-based air cooling system, and high-capacity brick-based air heating system.

Plug-in electric and hybrid vehicles (PEV/PHEV) may also be considered as DER, The electric vehicles may be used to supply stored electric energy back to the grid, a.k.a. Vehicle-to-grid (V2G).

Behind-the-meter DER may be bundled with regular load and managed alongside the demand response resources – such as a residential roof-top PV solar panel. But often, DER is treated separately in part due to its control capabilities. In addition to a regular retail tariff, behind-the-meter DER may be subject to net-metering or feed-in tariff, where excess generation can be exported to the grid at an established or a dynamic price.

Similar to DR resources, DER assets can be registered and enrolled into a DR program. Furthermore, DER assets are typically required to meet additional technical requirements and certification for grid interconnection. Depending on the size of a DER and its export capabilities, sub-metering and telemetry capabilities may be required to monitor the impact of the DER operation on the distribution grid reliability and power quality. Also, renewable resources may receive Renewable Energy Credits (RECs) and may also qualify as a must-run resource, e.g., wind power in some regions. These need to be incorporated into pricing and control signals associated with DER operation.

The North American Energy Standards Board (NAESB) is a voluntary non-profit organization comprised of members from all aspects of the natural gas and electric industries. Within NAESB, the Retail Electric Quadrant (REQ) and the Retail Gas Quadrant (RGQ) focus on issues impacting the retail sale of energy to Retail Customers. REQ / RGQ Model Business Practices are intended to provide guidance to Distribution Companies, and other Market Participants involved in providing energy service to Retail Customers.

These Model Business Practices are voluntary and do not address policy issues that are the subject of state legislation or regulatory decisions. These Model Business Practices have been adopted with the realization that as the industry evolves, additional and amended Model Business Practices may be necessary. Any industry participant seeking additional or amended Model Business Practices (including principles, definitions, data elements, process descriptions, and technical implementation instructions) should submit a request to the NAESB office, detailing the change, so that the appropriate process may take place to amend the Model Business Practice.



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REQ.17.1 Principles

REQ.17.2 Definitions

REQ.17.2.A Business Definitions (Reserved)

REQ.17.2.B Techincal Definitions

New REQ.17.2.B Defined Terms to be added to REQ.17 are included in the Recommendation Request Titled Phase Two Requirements Specification for Common Electricity Product and Pricing Definition – for NIST PAP03 (REQ.15) to avoid redundancy between Model Business Practices.



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REQ.17.3 Model Business Practices

REQ.17.3.1 Specifications for Retail Standard Demand Response Signals

The following describes general business processes for implementing demand response capacities at the retail market level. The following principles apply to the development and application of these business practices.

#	Name	Description	Rationale	Implication
1	Scalability	The architecture should allow for the management of millions of Customer premises devices	Scale-out, adding more low-cost machines, has proven to be superior to scale-up, using larger single machines, as a way to handle large loads. For example, high traffic web sites use farms of low-cost machines to serve pages to millions of simultaneous web users.	Architecture should allow the solution to scale-out as more devices are added.
2	Actionable, testable, and transferable work products	Any work (artifacts) that are created can be used by the audience for this work, e.g., utilities, vendors, regulators, etc. There needs to be clear, explicit guidance for how to use the artifacts. There is an expectation that the work products are useful at lower levels of design.	Such work products will promote market adoption and minimize the cost and risk of adoption, leverage open and best practices, and establish repeatable processes, patterns, and templates for all work products.	The use of common tools and methods will be fostered. Organizations that do not follow the use of the common tools and methods may have more difficulty implementing the artifacts.



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#	Name	Description	Rationale	Implication
3	Platform Independence, Vendor Neutral	Requirements and design artifacts should be platform independent. Implementation technology shall be chosen due to its level of acceptance at the marketplace as open standards.	There is an expectation of differentiation and innovation in the marketplace. With greater dependence on a specific platform, there may be less architectural flexibility.	To achieve both technical and semantic interoperability, certain lower level technologies will need to be chosen. For example, Web Services technology is widely used for integration, and UML is widely used for modeling.
4	Cyber Secure	Architecture should incorporate latest secure computing techniques.	The integrity of the electric grid and market depend on preventing unauthorized actors from manipulating the DR and DER system.	Architecture should comply with the latest security guidance from the NIST SGIP Architecture Committee and CyberSecurity Task Group, when it comes to Web Services security related implementation.
5	Interoperability	DR signaling standards should utilize open, interoperable industry standard control and communication technologies to integrate with both common energy management and control systems that can conduct DR activities	Interoperability across different domains of Smart Grid is key to the success of DR signaling standards.	DR signaling standards should be developed in harmonization with others relevant standards as identified by the NIST SGIP.



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#	Name	Description	Rationale	Implication
6	Automatic Demand Response	The DR program (analysis, notification, event, action, monitoring, verification, settlement) should be automatic. DR signaling standards should provide secure, reliable communications with consumers for DR operations	Automation helps to ensure large scale and repeatable demand response implementation.	Security, reliability and testability should be ensured for DR automation.
7	Cover All Market Types	DR signaling standards should be supported and implementable in all four market types listed in this document	Standards development should not get in the way of regulatory policy decisions.	DR signals design need to support a wide range of programs and tariff/pricing structures.

REQ.17.3.1.1 Conventions

The use case modeling technique is used for capturing business and data requirements relative to Retail Demand Response. There are two basic diagrams used in this document. The first one is the use case diagram, which shows the scope of business use cases for a given business scenario. The relationships used in the use case diagrams are as follows:

- Include: this indicates additional scenarios
- Extend: this indicates alternatives scenarios
- Generalization (line with triangle head): this indicates variations (sub-types) of the main use case.
- Precedes: this indicates a time sequence
- Invokes: this indicates a pre-condition or dependency

The second is the sequence diagram, which shows the information exchange flows between actors for a given use case. The message flows are shown in one way with the convention of verb and noun, verb indicating the action being taken, noun indicating the name of the information being exchanged. The return message flow is the acknowledgement of the main message flow.

REQ.17.3.1.2 ACTORS

The actors listed in the table below are specific to these Model Business Practices and are a subset of the actors and related objects defined in REQ.15. Details on the relationships between the actors and related objects are further defined in Appendix A.



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Table 1 - Actor Roles

Term	Actor ID ¹
Communication Method	5.5
Control	5.2
Designated Dispatch Entity	3.4
Designated Dispatch Entity (DDE)	3.4
End Device (ED)	4.5
Enrollment	5.3
Environmental Authority (EA)	1.3
Federal Regulator (FR)	1.1
Load Serving Entity	3.2
Load Serving Entity (LSE)	3.2
Local Authority (LA)	1.5
Market Participant (MP)	2.2

¹ The Actor ID shown in the table refers to the item number of the corresponding actor or related object in the Entity-Relationship Diagram provided in Appendix A. Definitions of the actors and related objects are included in REQ.17.2



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Term	Actor ID ¹
Measurement	5.1
Metering Authority	3.6
Metering Authority (MA)	3.6
P-Node	5.6
Service Location	4.3
Reliability Authority (RA)	1.2
Resource	4.1
Scheduling Entity	3.3
Scheduling Entity (SE)	3.3
Service Provider (SP)	3.1
State Regulator (SR)	1.4
System Operator	2.1
Transmission/Distribution Service Provider (TDSP)	3.5



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Term	Actor ID ¹
Utility Customer (UC)	2.4
Utility Distribution Operator (UDO)	2.3
Zone	5.4

REQ.17.3.1.3 Use Case Overview

Similar to the Wholesale Demand Response use cases, Retail Demand Response use cases generally follow five main steps, see the Figure 1².

1. Administrate DR Program
2. Administrate Customer for DR
3. Administrate DR Resource
4. Execute DR Event
5. Post DR Event Management

There are many programs that exist in today's retail markets with or without open competition. New programs will be defined and deployed in the future. The goal of this use case analysis is to find commonalities among these programs so that the derived DR signal messaging specification can be implemented to support a large number of DR programs.

The focus of the Standardized DR Signals is the step 4, Execute DR Event, where the DR signals will be communicated between the DR Providers and the DR resources. All other use cases are supporting materials to ensure that DR use case requirements are documented and understood in a complete picture.

The use cases included in this document are not intended to be required or exhaustive and are provided for informational purposes.

² DR program administration related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from the final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the customer enrollment and DR program administration related business practices.



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uc DR Use Cases Overview Diagram (simple)

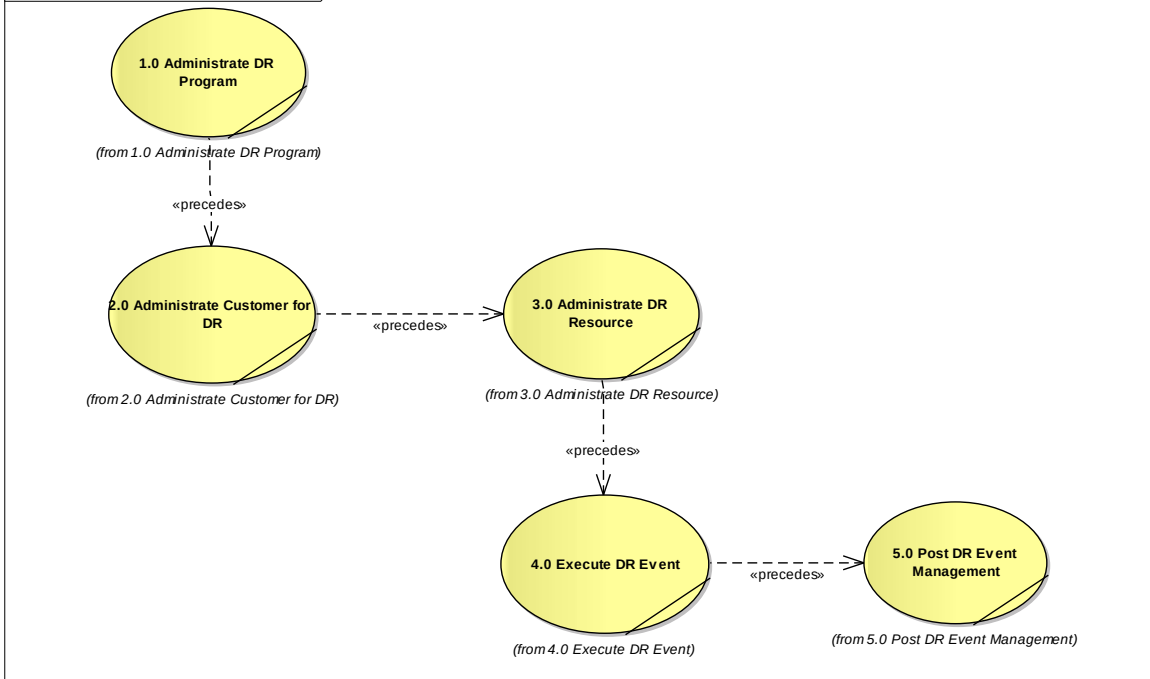


Figure 1. Retail Market DR Use Case Overview



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REQ.17.3.2 Specific Use Cases (Note: the following terms are defined herein and are in addition to those listed as technical definitions in REQ.17.2.B)

REQ.17.3.2.1 Administrate DR Program

DR program administration related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from the final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the customer enrollment and DR program administration related business practices.

REQ.17.3.2.2 Administrate Customer for DR

DR program customer enrollment related use cases are determined by the SGTF as out of scope for the NIST PAP09 purpose, and therefore the original content has been removed from the final recommendation and resulting Model Business Practices presented here. NAESB may start a new project to deal with the customer enrollment and DR program administration related business practices.

REQ.17.3.2.3 Administrate DR Resource

DR Resource is an equivalent of Resource defined in the actor list table.

As part of enrolling customers to a DR program, specific DR resources and assets that are associated with customers' accounts and premises will also need to be registered. Figure 4 shows the actors and use cases involved in administrating DR resources and/or assets into DR programs. The following use cases deal with the registration, update, and removal of DR resources and assets associated with a customer. When updating DR resources, there will also be potential use cases of DR bidding process, either for supplying or for buying power. There are also cases where Distributed Energy Resources will act as DR assets.



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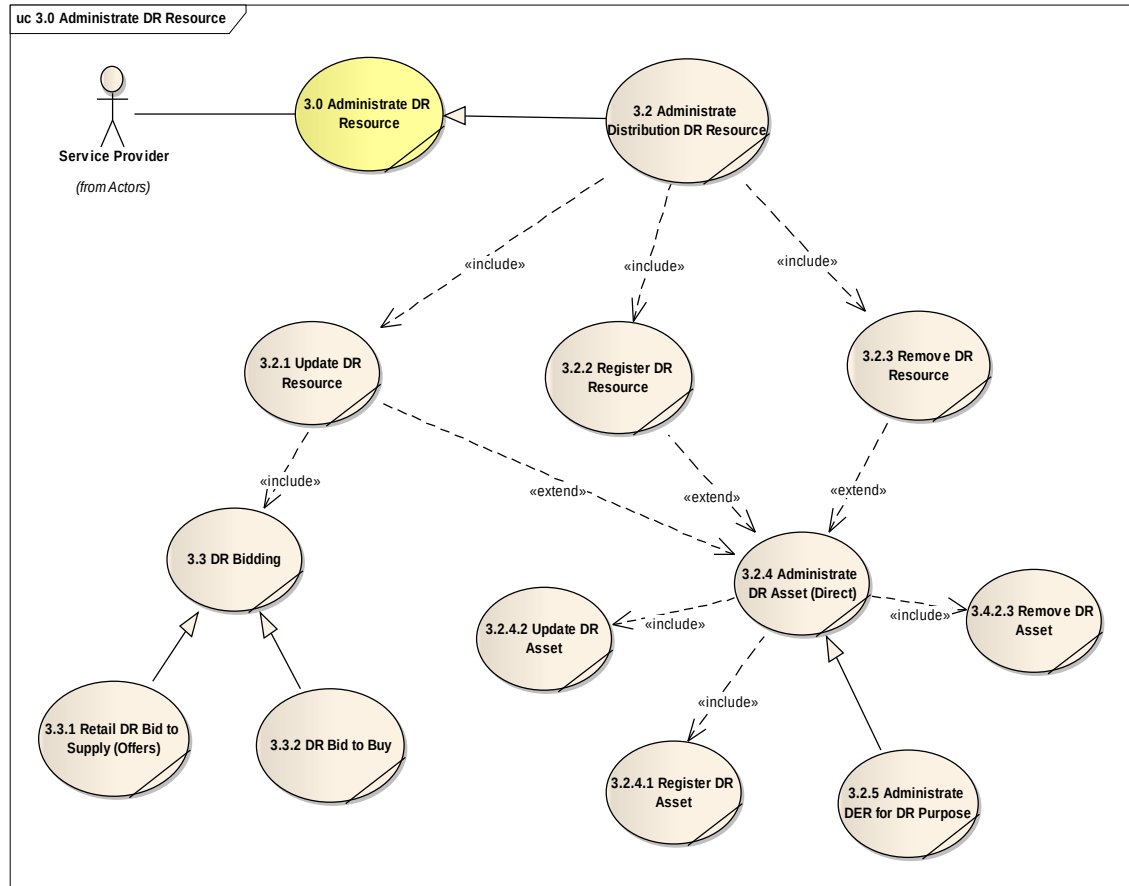


Figure 2. Administrate DR Resources and/or Assets into DR Programs

REQ.17.3.2.3.1

Administrate Distribution DR Resource

These activities are used to administer all of the DR Resources and Assets, including a variety of activities surrounding the registration of DR Resources and the management of information surrounding the DR Resources that a Service Provider may call upon during a DR event. Before a DR Resource may be called upon, it must be registered with the Service Provider. The administration of a DR Resource covers the following requirements:

- The need of the Service Provider to identify a DR Resource for communications purposes;
- The need of the Service Provider to establish DR Resource accounts for accounting purposes;
- The need of the Service Provider to collect information from DR Resources prior to DR events for the purposes of determining which DR Resources to call upon during a DR



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Event; and

- The need of the Service Provider to collect information from DR Resources prior to DR events for the purposes of determining the nature of the DR signals to send to the DR Resources.

REQ.17.3.2.3.2 Update DR Resource

REQ.17.3.2.3.2.1 Description

When the base capacity of a DR Resource changes from when it was last registered with the DR provider, customer needs to provide updated information to the DR provider so that such information can be factored into the consideration for DR event planning.

REQ.17.3.2.3.2.2 Data Elements³

Attribute Name	Description
Resource ID	Identifier assigned to the Resource
Resource Type	Type of Resource. Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, and storage.
Transmission/Distribution Service Provider Account Number	Transmission/Distribution Service Provider's (Utility) account number for the Resource.
Demand Response Provider	The entity that is responsible for delivering Demand reductions from Demand Resources and is compensated for providing such Demand Response products.
DR Resource Group ID	Grouping of Resources that can respond to the same DR Signal.
Program Identifier	The identifier of the program
Constraint Type	Type of operational, schedule or offer constraint
Constraint Interval	The timeframe over which the constraint type applies.
Constraint Value	Value of the Constraint Type and Interval

³ Except as otherwise footnoted, the Data Elements defined are contributed from the work of: Piette, M.A., G. Ghatikar, S. Kiliccote, E. Koch, D. Hennage, P. Palensky, and C. McParland. 2009. Open Automated Demand Response Communications Specification (Version 1.0). California Energy Commission, PIER Program. CEC-500-2009-063 and LBNL-1779E (<http://openadr.lbl.gov/pdf/cec-500-2009-063.pdf>).



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

Attribute Name	Description
Effective Enrollment Date	Effective Start Date for the Enrollment
Location	The location of a Resource defined by one or more of the following attributes:
Location Attributes	
Service Location ID	Identifier assigned to the Service Location
Address1	Address line 1
Address2	Address line 2
City	City
State/Province	State or Province two-letter code
Zip/Postal Code	Zip or Postal Code
Country	Country
GPS Coordinates	Latitude and longitude
Weather Station	Weather Station code associated with the Service Location
Zone ID	Identifier assigned to the Zone in which the Service Location is located
Zone	Name of the Zone in which the Service Location is located
Electrical Node ID	Identifier assigned to the Electrical Node at which the Service Location is connected
Electrical Node Name	Name of the Electrical Node at which the Service Location is connected
Electrical Node Type	Type of Electrical Node at which the Service Location is attached
PNode	Name of the Price Node associated with the Service Location
PNode ID	Identifier assigned to the Price Node associated with the Service Location
End of Location Attributes	
Response Time	The amount of time before an asset/resource is capable of meeting its full performance, in response to a request by a Service Provider to shed load or generate power.
Capacity Type	Type of Capacity

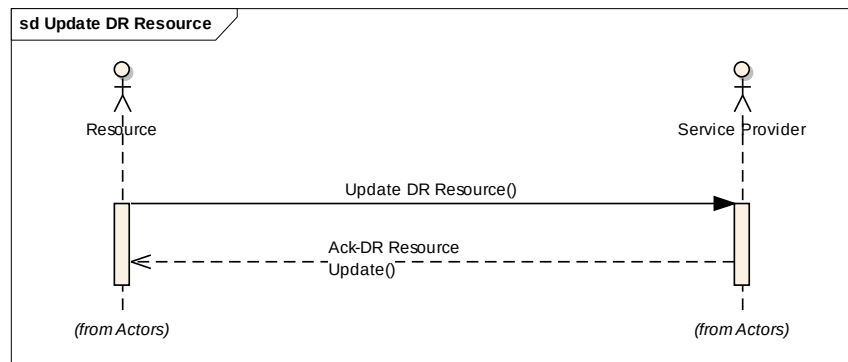


RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

Attribute Name	Description
Capacity Type description	Description of the Type of Capacity
Nominal Capacity	Nominated load
Offer Commit Status.	Commitment status of offer Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc. Also referred to as "opt-in" or "opt-out" for existing Demand Response Programs.
Resource Type	Type of Resource Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.
Resource Qualification Test Date	Date the Resource demonstrated its ability to deliver a product or service
Requalification Test Date	Date the Resource will retest its ability to deliver a product or service
Enrollment End Date	Date of Termination of Enrollment
Enrollment Status	Status of the Enrollment for the Resource

Sequence Diagram



REQ.17.3.2.3.3

Register DR Resource

REQ.17.3.2.3.3.1 Description



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

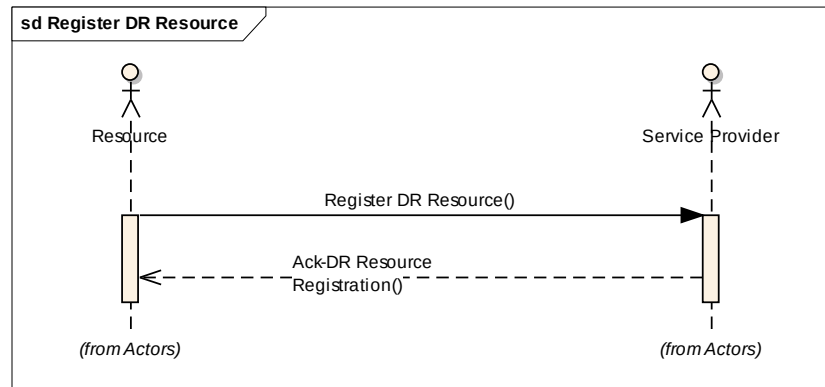
For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

A party with ownership, controlling interest, or administrative responsibilities for a DR Asset or DR Resource that communicates status-related operational information about the DR Asset or DR Resource to a Service Provider. For example, the owner of a DR Resource or Asset may wish to declare their inability to shed load (an outage) due to summer shutdown or may wish to reduce the available capacity of a resource/asset due to equipment maintenance or other causes.

REQ.17.3.2.3.2 Data Elements

The Data Elements are the same for Register / Enroll DR Resource and Update DR Resource.

Sequence Diagram



REQ.17.3.2.3.4 Remove DR Resource

REQ.17.3.2.3.4.1 Description

When a DR resource is no longer available permanently for DR purpose, it needs to be removed from the DR program for that customer so that it will be accounted for DR event planning.

REQ.17.3.2.3.4.2 Data Elements

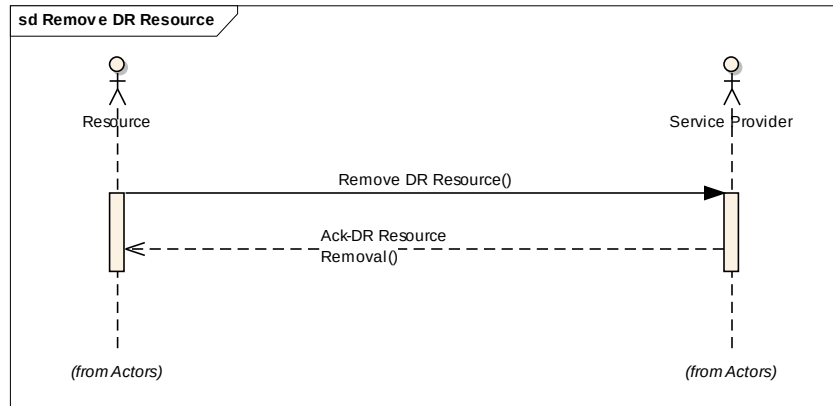
Attribute Name	Description
Resource ID	Identifier assigned to the Resource that is removed.
Program Identifier	The identifier of the program
Enrollment End Date	Date of Termination of Enrollment
Enrollment Status	Status of the Enrollment for the Resource (Set to 'REMOVE')



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Sequence Diagram





RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.2.4 Administrate DR Asset (Direct)

REQ.17.3.2.4.1 Register DR Asset

REQ.17.3.2.4.1.1 Description

The DR Asset registration process must capture key identifiers to enable accurate tracking of DR assets and their capabilities. A requirement for a System and Market Operator, Load Serving Entity, Service Provider, or other entity facilitating the registration process (hereinafter referred to as DR Asset Administrator) is to track assets. This is done through DR asset registration and association of physical DR assets to DR Resources to recognize the asset and its potential contribution as part of a DR Resource. The DR Asset Administrator ultimately administers the DR Asset registration process to recognize DR Assets that can serve as part of a DR Resource, although the Customer may be party to the registration process.

REQ.17.3.2.4.1.2 Data Elements

Attribute Name	Description
Asset ID	The unique identifier of the asset
Program Identifier	The identifier of the program
DR Asset Group ID	Grouping of Assets that can respond to the same DR Signal within a DR Resource. (See DR Resource Specification)
Asset Operator ID	The identifier of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.
Asset Operator Name	The name of the business entity that operates the DR assets. This is the entity that has physical control of the asset and control of the capability to participate in DR Events.
Asset Owner ID	The Identifier of the business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).
Asset Owner Name	The Name of business entity that owns the DR assets (entity that has the right to use or transfer use of the asset).
Location	The location of a Resource defined by one or more attributes:
Service Location ID	Identifier assigned to the Service Location
Address1	Address line 1



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Attribute Name	Description
Address2	Address line 2
City	City
State/Province	State or Province two-letter code
Zip/Postal Code	Zip or Postal Code
Country	Country
GPS Coordinates	Latitude and longitude
Weather Station	Weather Station code associated with the Service Location
Zone ID	Identifier assigned to the Zone in which the Service Location is located
Zone	Name of the Zone in which the Service Location is located
Electrical Node ID	Identifier assigned to the Electrical Node at which the Service Location is connected
Electrical Node Name	Name of the Electrical Node at which the Service Location is connected
Electrical Node Type	Type of Electrical Node at which the Service Location is attached
PNode	Name of the Price Node associated with the Service Location
PNode ID	Identifier assigned to the Price Node associated with the Service Location
Effective Enrollment Date	Effective Start Date for the Enrollment (Registration)
Enrollment Status	Status of the Enrollment for the Asset
Offer Commit Status	Commitment status of offer Product-specific commitment status types included with offer. Examples include: economic, emergency, must-run, not participating, outage run status, override status, etc. Also referred to as "opt-in" or "opt-out" for existing Demand Response Programs.
DR Asset Physical Capabilities	Asset Capabilities include Ramp Rates and Capacity.
Ramp Rate Value	Ramp Rate associated with the selected Ramp Rate Type for the selected Ramp Rate Segment and Ramp Rate Direction
Capacity Type	Type of Capacity

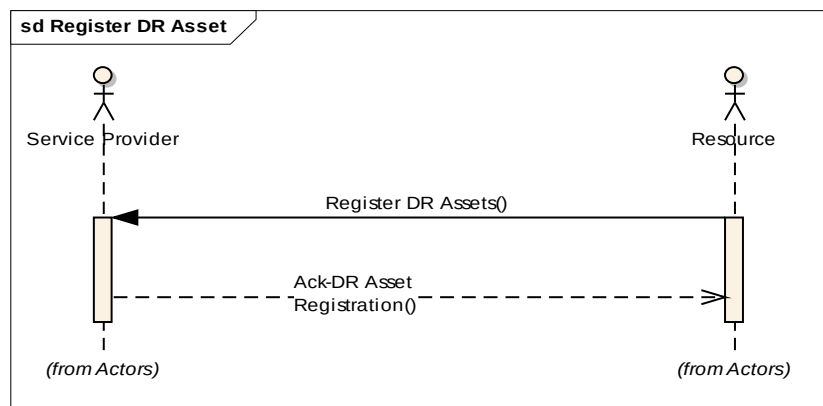


RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

Attribute Name	Description
Capacity Type description	Description of the Type of Capacity
Nominal Capacity	Nominated load
Asset Manufacturer	Manufacturer of the Asset
Asset Model	Model Identifier of the Asset assigned by the Manufacturer
Asset Version	Model Version Identifier assigned by the Manufacturer.
Asset Manufacture Date	Date of Manufacture of the Asset
Asset Type	Type of Asset. Examples are: load reduction (curtailable or interruptible load), generation, combination, DG, renewable, storage, etc.
DR Resources	The identifier of DR resources that the DR Assets belong to. An Asset can associate with multiple Resources, but with only one Resource for a DR Program.

Sequence Diagram





RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.2.4.2 Update DR Asset

REQ.17.3.2.4.2.1 Description

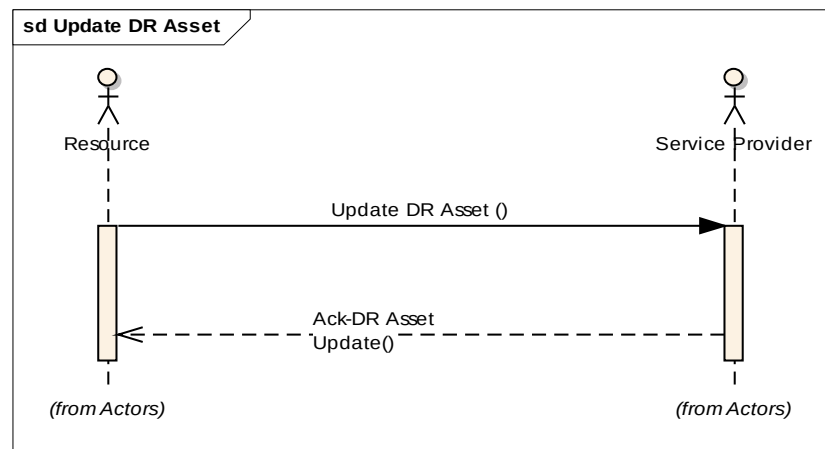
Once a DR asset registration is completed, changes to elements of the registration may be required or desired. After identifying the specific required modification and verifying the authorization to perform the update, each of the considerations identified in the DR Asset registration step should be evaluated and utilized, where necessary, during the update of the DR Asset information. The ability to update DR Asset information helps to ensure the asset information on record is current and complete.

Parties that are privy to and rely on the update should be notified of updates as soon as practicable after they are made. Additionally, these parties should have access to review and, in some cases, to approve/disapprove the update(s).

REQ.17.3.2.4.2.2 Data Elements

The Data Elements are the same for Register / Enroll DR Asset and Update DR Asset.

Sequence Diagram





RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.2.4.3 Remove DR Asset

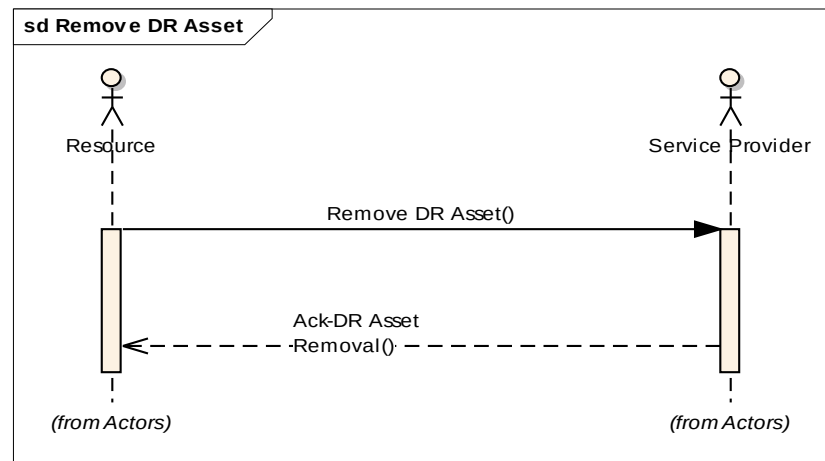
REQ.17.3.2.4.3.1 Description

Removing a DR Asset must take into account any DR Resource long term commitments in System Operator programs and contractual obligations with Service Providers or Load Serving Entities. In addition, applicable regulatory agency filings and approvals must be considered prior to removing a DR Asset from a DR program.

REQ.17.3.2.4.3.2 Data Elements

Attribute Name	Description
Asset ID	The unique identifier of the asset
Program Identifier	The identifier of the program
Enrollment End Date	Date of Termination of Enrollment
Enrollment Status	Status of the Enrollment for the Asset ('REMOVE')

Sequence Diagram





RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.2.5

DR Bidding

Description

Demand Response Bidding occurs after the DR Assets and Resources that are to comprise the desired bid have been registered and a bid or an offer is to be formed. The DR Bidding use case has two sub-use cases, depending on the type of bid to be developed for submission: a bid to supply (i.e., an offer), or a bid to buy. The entity operating the DR bidding program (the Bid Receiver) receives bids from participants (the Bidders). The Bidder may be a Customer bidding with either an energy retailer (e.g., LSE, ESP), a Service Provider (e.g., CSP, DRP), or a power marketer (i.e., wholesale market participant). The Bidder may also be a Service Provider bidding up to a LSE or power marketer.

Before the start of the bidding process, it is assumed that DR Resources available for selection are already registered to provide the physical resource participating in the DR Bidding program. It is also assumed that the bidder has already registered to bid with the bid receiver and has been informed on the appropriate timing and parameters for bid participation. The DR bidding process starts with the decision of the Bidder to develop a bid for submission. The Bidder submits its bid to the Bid Receiver within the appropriate time window and following set guidelines for bidding. The Bidder receives information on the outcome of the submitted bid from the Bid Receiver, who notifies of the bid outcome (e.g., a resource award or other DR commitment).

Examples of retail DR Bidding programs include:

- Demand Bidding
- Capacity Bidding

REQ.17.3.2.5.1

DR Bid to Supply (Retail Offers)

REQ.17.3.2.5.1.1 Description

The Bid Receiver opens the forum/venue for receiving an offer. (This may include initiating the bidding process by sending initial information to Bidders indicating parameters of acceptability for bids to be made). The Bidder communicates an offer to supply a specified product/service and the pricing or other incentive structure the bidder is willing to accept for DR. (This may be as simple as the customer sending a response back to the Bid Receiver that accepts or rejects the initial bid sought, or may involve more complex bid structuring).



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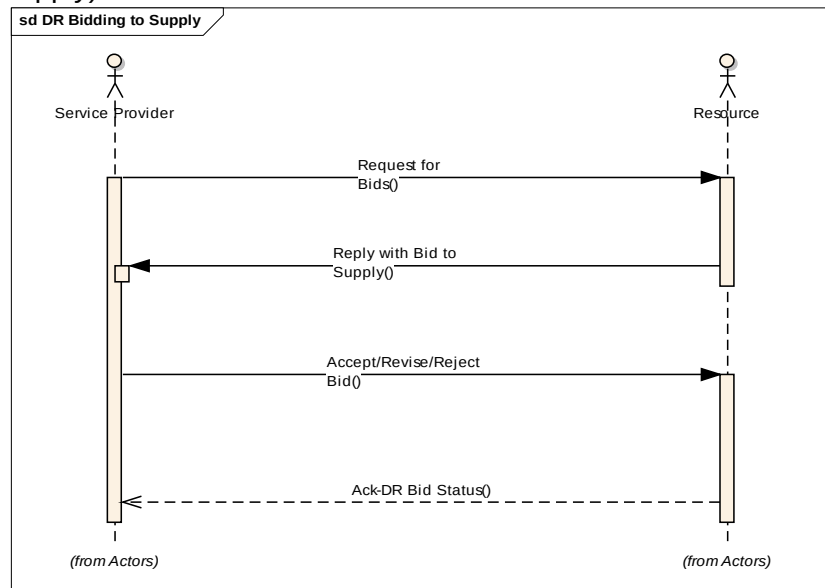
Each offer will have a clearly specified product or service that is being bid and the pricing/incentive structure being offered. The bidder also nominates the amount of and nature of supply being offered, the DR Resource to physically provide the service, and other physical parameters affecting resource availability and capability, in addition to the identity (or ID) of the bidder and resource(s) that comprise the bid.

The Bid Receiver reviews bids (offers) received and clears them, notifying the bidders of the outcome.

The Bidder receives the notification of awards or resource commitments and uses the information internally in preparation for DR Resource Dispatch.

REQ.17.3.2.5.1.2 Sequence Diagram

(Note, the Bid in the following sequence diagram is an offer to supply)





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Request Title: Phase Two Requirements Specification for
Retail Standard DR Signals – for NIST PAP09

REQ.17.3.2.5.2

DR Bid to Buy

REQ.17.3.2.5.2.1 Description

The Bid Receiver opens the forum/venue for receiving a bid. (This may include initiating the bidding process by sending initial information to Bidders indicating parameters of acceptability for bids to be made). The Bidder communicates a bid to buy a specified product/service and the pricing or other incentive structure the bidder is willing to pay to avoid DR. (This may be as simple as the customer sending a response back to the Bid Receiver that accepts or rejects the initial bid sought, or may involve more complex bid structuring).

Each bid will have a clearly specified product or service that is being bid for purchase and the corresponding pricing structure that is acceptable to the Bidder. The Bidder also includes the quantity of product/service in the bid to buy, and specifies any DR Resource(s) that can physically substitute for the product/service in the event the bid to buy is not cleared (i.e., the bidder is unwilling to pay more than the going/market outcome price for the product/service). Other information submitted include physical parameters affecting resource availability and capability, in addition to the identity (or ID) of the bidder and resource(s) that comprise the bid.

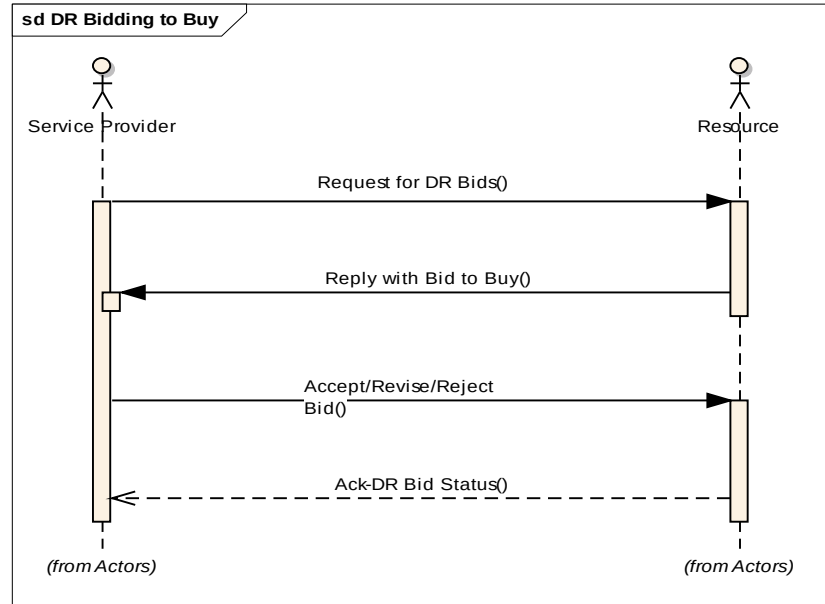
The Bid Receiver reviews bids received and clears all bids, notifying the bidders of the outcome. The Bidder receives the notification of resource commitments and uses the information internally in preparation for DR Resource Dispatch.



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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REQ.17.3.2.5.2.2 Sequence Diagram





RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
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REQ.17.3.2.6 Execute DR Event

The execution of a DR event takes different forms depending on operational situation and the type of DR programs being executed. Typically, they fall into one of the following four use cases, see Figure 5:

1. Advanced DR Notification
2. Broadcast DR Message (price plus information)
3. DR dispatch instruction
4. DR direct load control.

Operational considerations for DR event execution are also associated with DR programs where direct load control or dispatching instructions are carried out.

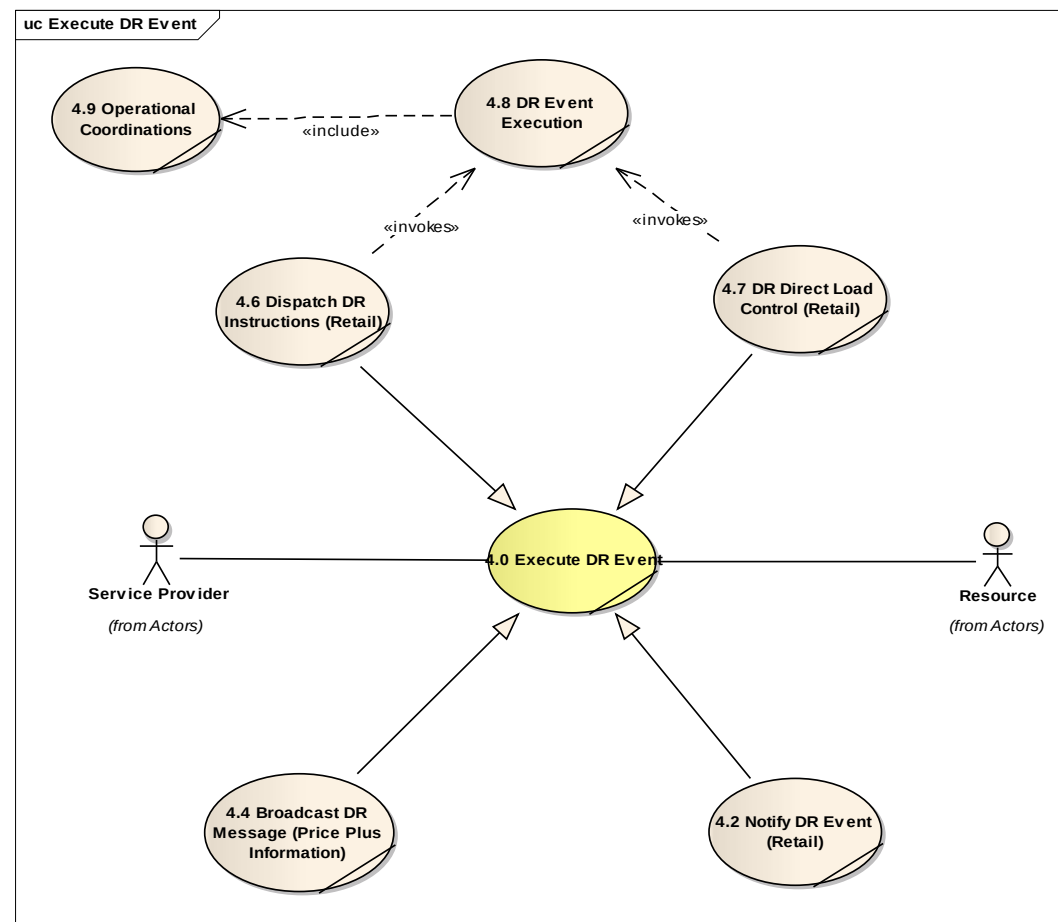


Figure 5. Execute DR Events



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

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Requesters: Smart Grid Interoperability Panel
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REQ.17.3.2.7 Notify DR Event (Retail)

REQ.17.3.2.7.1 Advanced Notification for DR (Retail)

REQ.17.3.2.7.1.1 Description

This is used by the Service Provider to send the DR Event notification (i.e., DR signal) to the DR Resource.

The Notify DR Event Message applies to one of three types:
 Broadcast DR Message (Price Plus Information)
 Dispatch DR Instructions for Objectives (Retail)
 DR Direct Load Control (Retail).

The message content specific to each of these types is defined in their respective sections below.

REQ.17.3.2.7.1.2 Data Elements

The following are the data elements that are common to all of the Event Message Types.

Attribute Name	Description
Program ID	Program Identifier
Program Name	Name of the Program
Service Provider ID	Identifier assigned to the Service Provider
Event ID	Identifier assigned to the Event
Event Modification Number	A modification number for the DR event. This is used to indicate if the DR Event has been modified by the Utility. Each time it is modified, this number is incremented.
Area of Event Notice Applicability: The area affected by the Demand Response Event can be defined by a Location attribute (point location or area) or is applicable to a Resource or to an Asset for Direct Load Control.	
Resource ID	Identifier assigned to the Resource
Asset ID	The unique identifier of the asset
Location can be identified by any of the following:	
Service Location ID	Identifier assigned to the Service Location
Address1	Address line 1
Address2	Address line 2
City	City
State/Province	State or Province two-letter code
Zip/Postal	Zip or Postal Code



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
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Attribute Name	Description
Code	
Country	Country
GPS Coordinates	Latitude and longitude
Weather Station	Weather Station code associated with the Service Location
Zone ID	Identifier assigned to the Zone in which the Service Location is located
Zone	Name of the Zone in which the Service Location is located
Electrical Node ID	Identifier assigned to the Electrical Node at which the Service Location is connected
Electrical Node Name	Name of the Electrical Node at which the Service Location is connected
Electrical Node Type	Type of Electrical Node at which the Service Location is attached
PNode	Name of the Price Node associated with the Service Location
PNode ID	Identifier assigned to the Price Node associated with the Service Location
The following are other attributes applicable to all DR Event Messages.	
Deployment Type	Type of Deployment. Examples are: Advanced (Normal), Immediate, Audit/Test.
Simple Signal Levels	Used as an alternate and simplified representation of the DR signal, whether it be price based or a dispatch. Takes on a small number of finite levels such as NORMAL, MODERATE, and HIGH, SPECIAL



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Attribute Name	Description																																				
Criticality Level	This field defines the level of criticality of this event. The action taken by load control devices for an event can be solely based on this value, or combination with other Load Control Event fields supported by this device. For example, additional fields such as Average Load Adjustment Percentage, Duty Cycle, Cooling Temperature Offset, Heating Temperature Offset, Cooling Temperature Set Point or Heating Temperature Set Point can be used in combination with the Criticality level. <table><tr><th>Criticality Level</th><th>Level Description</th><th>Participation</th></tr><tr><td>0</td><td>Reserved</td><td></td></tr><tr><td>1</td><td>Green</td><td>Voluntary</td></tr><tr><td>2</td><td>1</td><td>Voluntary</td></tr><tr><td>3</td><td>2</td><td>Voluntary</td></tr><tr><td>4</td><td>3</td><td>Voluntary</td></tr><tr><td>5</td><td>4</td><td>Voluntary</td></tr><tr><td>6</td><td>5</td><td>Voluntary</td></tr><tr><td>7</td><td>Emergency</td><td>Mandatory</td></tr><tr><td>8</td><td>Planned Outage</td><td>Mandatory</td></tr><tr><td>9</td><td>Service Disconnect</td><td>Mandatory</td></tr><tr><td>0x0A to 0x0F</td><td>Utility Defined</td><td>Utility Defined ⁴</td></tr></table>	Criticality Level	Level Description	Participation	0	Reserved		1	Green	Voluntary	2	1	Voluntary	3	2	Voluntary	4	3	Voluntary	5	4	Voluntary	6	5	Voluntary	7	Emergency	Mandatory	8	Planned Outage	Mandatory	9	Service Disconnect	Mandatory	0x0A to 0x0F	Utility Defined	Utility Defined ⁴
Criticality Level	Level Description	Participation																																			
0	Reserved																																				
1	Green	Voluntary																																			
2	1	Voluntary																																			
3	2	Voluntary																																			
4	3	Voluntary																																			
5	4	Voluntary																																			
6	5	Voluntary																																			
7	Emergency	Mandatory																																			
8	Planned Outage	Mandatory																																			
9	Service Disconnect	Mandatory																																			
0x0A to 0x0F	Utility Defined	Utility Defined ⁴																																			
Baseline Dates	Dates of days used to calculate the Energy Baseline																																				
Baseline Exclusion Dates	Dates of days Excluded from the calculation of the Energy Baseline																																				
Energy Baseline Value	Calculated Energy Baseline																																				
Energy Baseline Timestamp	Timestamp of Energy Baseline																																				
Deployment Period (Interval): The deployment period that is communicated to a Resource or Asset is an interval contained within the Start or End Time of the Event, but not necessarily for the entire Event.																																					
Event Start Time	Time of Start of deployment period for Event																																				
Event End Time	Time of End of deployment period																																				

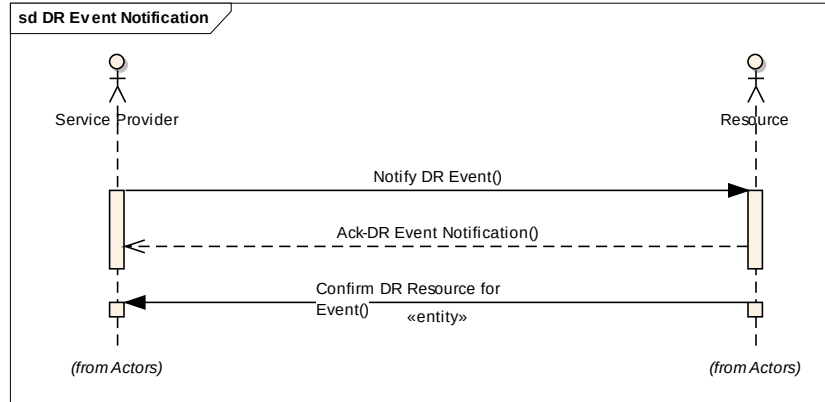
⁴ Requirement as defined by the ZigBee Smart Energy Profile™ 2.0 Technical Requirements Document



RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
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REQ.17.3.2.7.1.3 Sequence Diagram





RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.2.7.2

Update a DR Event (Retail)

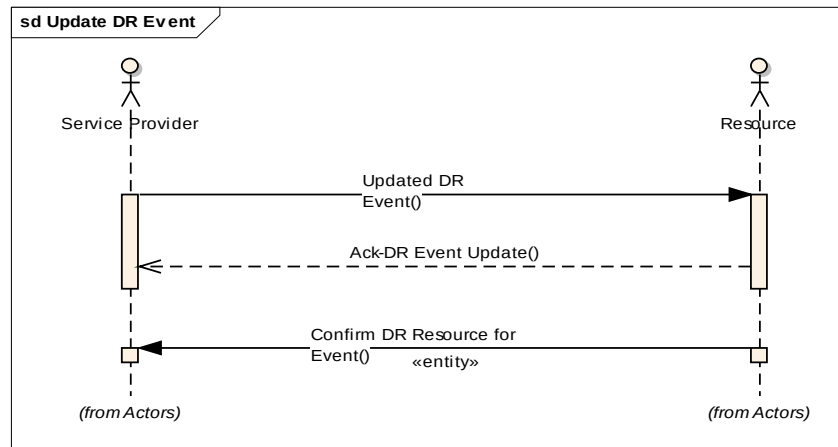
REQ.17.3.2.7.2.1 Description

This is used to update a DR event that has been previously notified. The requirements for this use case are the same as those for the "Advanced Notification for DR" use case.

REQ.17.3.2.7.2.2 Data Elements

Attribute Name	Description
Event	See the "Advanced Notification for DR" use case.
Event Modification Number	This is Modification number of the DR event. It is used to indicate that the DR Event has been modified by the Utility or Service Provider. Each time a DR Event is modified, this number is incremented.
Modification reason code	The reason the event was modified.

REQ.17.3.2.7.2.3 Sequence Diagram





RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for Retail Standard DR Signals – for NIST PAP09

REQ.17.3.2.7.3

Cancel a DR Event (Retail)

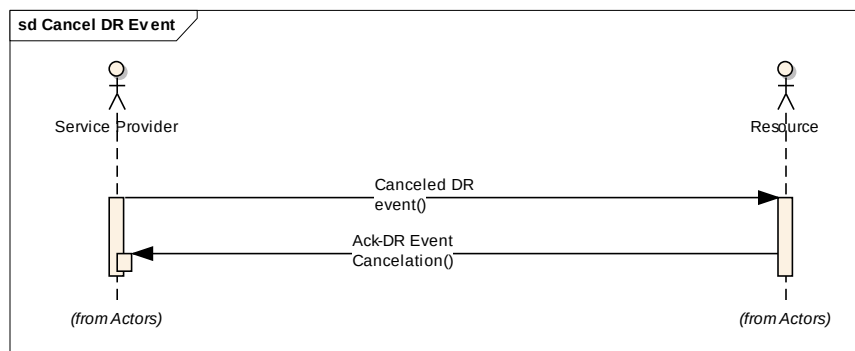
REQ.17.3.2.7.3.1 Description

This is used by the Service Provider to notify the DR Resource that a DR Event is being cancelled. It should only be executed if a DR Resource has previously received notification of a DR Event and that event has subsequently been cancelled.

REQ.17.3.2.7.3.2 Data Elements

Attribute Name	Description
Modification reason code	The reason the event is being cancelled.
Event Status	Status of the Event
DR Event Identifier	An identifier for the event that is being cancelled.
Effective date/time	The date and time a cancellation takes effect.

REQ.17.3.2.7.3.3 Sequence Diagram





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REQ.17.3.2.7.4

DR Resource Confirmation (Retail)

REQ.17.3.2.7.4.1 Description

This is a confirmation message that is sent by a DR Resource to the Service Provider as a result of receiving a DR Signal from the Service Provider. It may be used as an acknowledgement of the receipt of the DR signal, but it may also contain various information used to signify how the DR Resource will respond to the DR Signal.

Any changes to the Resource or Asset that may impact participation or performance for the Event (such as Location and Load Profile) should be provided through the Update Resource or Update Asset Messages.

REQ.17.3.2.7.4.2 Data Elements

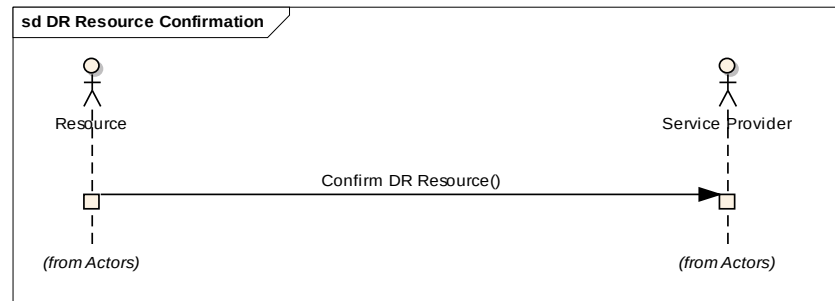
Attribute Name	Description
Resource ID	Identifier assigned to the Resource
Asset ID	The unique identifier of the asset
Exception Conditions	This is used to report that the load controller may not behave as commanded because of a variety of conditions including: • Faults in device • Customer override.
Load Control State	The state of the load, which includes both commanded states and user settings. This may include a schedule of future states if a particular control algorithm for the load controller is being executed.
Operational Constraints	Operational Constraints at run time may differ from those provided at Enrollment, and will be applicable only to the time interval of the Event for this Resource or Asset.
Constraint Type	Type of operational, schedule or offer constraint
Constraint Interval	The timeframe over which the constraint type applies.
Constraint Value	Value of the Constraint Type and Interval
Offer Dispatch Status	Dispatch Status of Offer a.k.a. as "Opt-in" or "Opt-out" in existing programs.



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REQ.17.3.2.7.4.3 Sequence Diagram



REQ.17.3.2.8

Broadcast DR Message (Price Plus Information)

REQ.17.3.2.8.1 Description

Demand Response programs are designed to address different power system concerns caused by the imbalance between generation, transmission and consumption, or environmental concerns. Some DR programs are conducted on a voluntary basis, where the customer can opt to maintain the level or load. Some DR programs are mandatory, where either the customer loads will be curtailed under certain conditions or the customer will incur financial penalties for noncompliance.

In retail market, certain “DR Messages” can be broadcasted to DR resources either directly or through Service Providers. DR Message is defined as information about the DR signals that may affect the demand behaviors of the energy consumers. Obviously, the main component of the DR Message is the pricing information. However, there are other attributes of energy being delivered that may be of interest to energy consumers and could be included in the DR Message.

Based on the OpenADR discussion, the broadcasting function is mainly used for volunteer or non-mission critical DR messages. Therefore, message acknowledgement or confirmation is optional.

REQ.17.3.2.8.2 DR Source of Power/Generation

“DR Message” also can be source of power or generation. ANSI C12.19-2008 defined the following source of power/generation in Standard Table 12.

Precondition:

The DR Service Provider sends the DR message to service providers. In the case of DR pricing, the DR Service Provider calculates the price



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per location and communicates the appropriate price associated with the DR product to service providers.

Post Condition:

DR Resources received the DR pricing information, and may or may not act based on the DR agreement or contract.

REQ.17.3.2.8.3 Data Elements

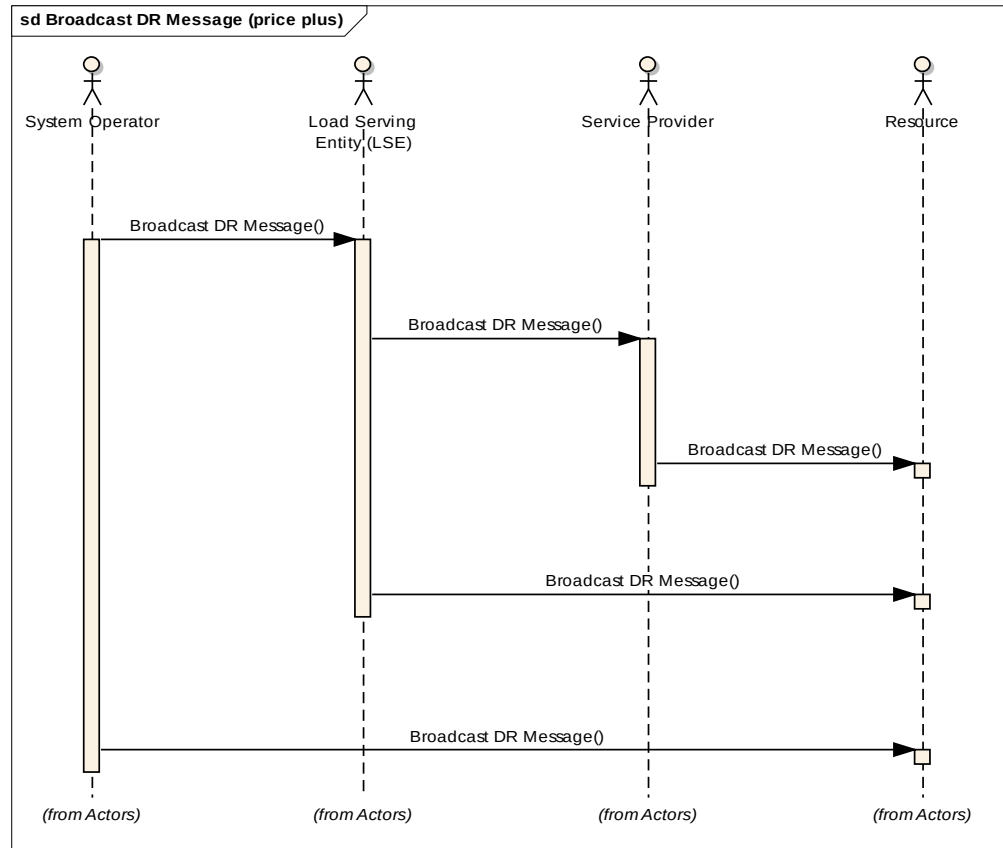
Attribute Name	Description
Currency	Economic unit of exchange in which the total price and price components are stated (e.g. dollars, euros)
Product Price	The sum of all Price Component Values for a given product (Total Price).
Product Price Factor	Terms of use attribute of Product Price Examples: Price absolute, Price relative, Price multiplier
Unit of Measure	Attribute of Product Identifier
Delivery Time	Time at which the product is available for physical consumption
Delivery Interval	The duration over which the product is available for physical consumption
Market Product (Product Type)	Market Product Product types include the following: energy, capacity, regulation, operating reserves (spinning or non-spin).



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REQ.17.3.2.8.4 Sequence Diagram



REQ.17.3.2.9 Dispatch DR Instructions (Retail)

REQ.17.3.2.9.1 Description

This interaction is used to dispatch DR Resources. This type of interaction is used when the Service Provider needs to achieve specific objectives from the DR Resources during DR events. This means that specific instructions will be given to the DR Resource with objectives (e.g. shed 100 kW) for the load profile of the DR Resource.

Note that for the retail use cases, a Dispatch is considered a special type of DR Notification, and thus, it is very similar in nature to the requirements given for that interaction.



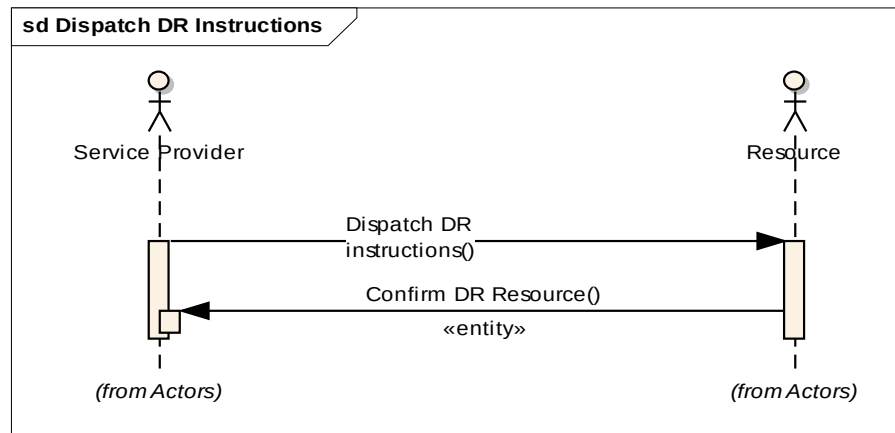
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REQ.17.3.2.9.2 Data Elements

Attribute Name	Description
DR Dispatches for DR Objective based messages are of three types.	
• LOAD LEVEL	
• LOAD AMOUNT	
• LOAD PERCENTAGE	
For Load Level: Load Level Value	Value of the load level to be achieved based on a set of enumerated values. (e.g. moderate, high, etc)
For Load Amount: Deployment MW	Deployment quantity expressed as an Absolute
For Load Percentage: Deployment MW	Relative Deployment quantity expressed as %.

REQ.17.3.2.9.3 Sequence Diagram



REQ.17.3.2.10 DR Direct Load Control (Retail)

REQ.17.3.2.10.1 Description

This use case covers direct interactions between the DR Service Provider and a specific DR Asset for the purposes of putting that asset into a specific load control state (e.g., to turn it on or off). In this case, the DR Asset is a DR Resource with only one DR Asset, and thus, the interaction is directly with the DR Asset.

See REQ.17.3.2.11.3, DR Execution - Direct Load Control (DLC) for more details.



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REQ.17.3.2.10.2 Data Elements

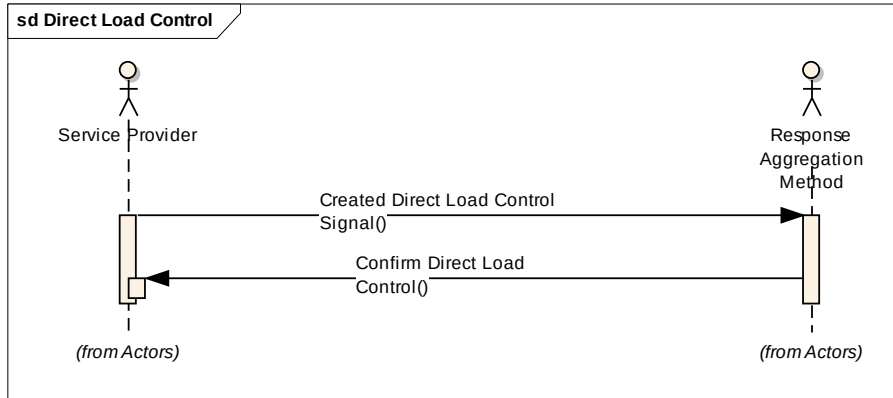
Attribute Name	Description
Asset ID	The unique identifier of the asset (Note: Direct Load Control messages are applicable only to Assets)
Status Check	A signal to require the DR resource status to be sent back. (Only applicable to Direct Load Control)
DR Control Command: Direct Load Control Type	The type of DR Direct Load Control Command: e.g. Set Point, Open/Close, Heating Temperature - offset/setpoint, Cooling Temperature - offset/setpoint, Load adjustment offset
DR Control Command: Direct Load Control Value	Value associated with the Direct Load Control Type.
Event Start Time	Time of Start of deployment period for Event
Event End Time	Time of End of deployment period
Duty Cycle	"Duty Cycle-: Defines the maximum On state duty cycle as a percentage of time. Example, if the value is 80, the device would be in an "on state" for 80% of the time for the duration of the event. Range of the value is 0 to 100. A value of 0xFF indicates the field is not used." (from SEP2.0) ^{4???}
Event Control	Event Control options for randomized start or end times: 1= Randomize Start time, 0=Randomized Start not Applied 1= Randomize End time, 0=Randomized End not Applied. (from SEP2.0) ^{4????}
Device Class	Enumeration representing the Device Class to apply the current Load Control Event. ^{4???}

REQ.17.3.2.10.3 Sequence Diagram



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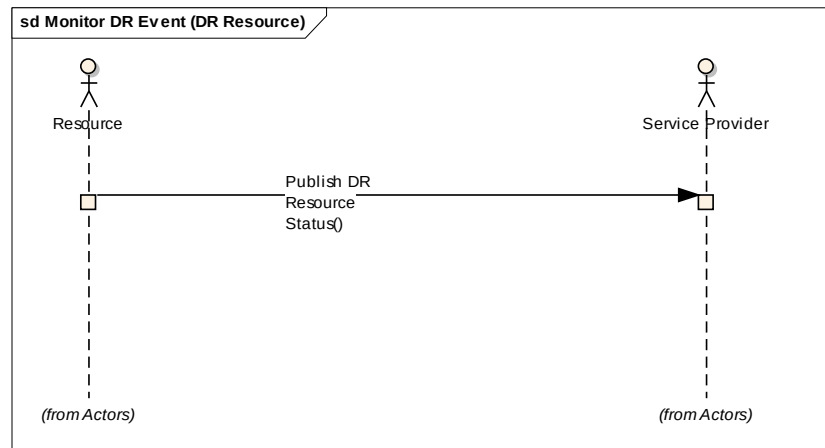
REQ.17.3.2.11

Monitor DR Event (DR Resource)

REQ.17.3.2.11.1 Description

This interaction is used to monitor a DR Resource's behavior. It may be executed as a result of the DR Resource receiving a DR signal or it may be conducted continuously.

REQ.17.3.2.11.2 Sequence Diagram

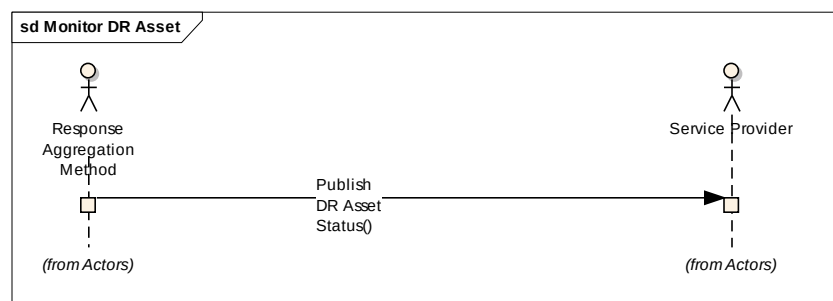


REQ.17.3.2.12 Monitor DR Event (DR Asset)

REQ.17.3.12.1 Description

This interaction is used to monitor the state of a DR Asset. It may be executed as a result of the DR Asset receiving a DR signal or it may be conducted continuously.

REQ.17.3.12.2 Sequence Diagram





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REQ.17.3.2.13 DR Event Execution

Demand Response is deployed for economic or a reliability purposes. At high penetration levels, demand response should be integrated with the power supply scheduling process, and it may impact the distribution grid operation and reliability, and perhaps the transmission grid operation and reliability. Thus it is important to include the required considerations for the grid and system level operations when developing DR Use Cases and DR signal standards. Such impacts may not be significant at low penetration levels; however, proper considerations should be given to support scalability and expandability for future deployments.

Power system operates based on a real-time balancing of supply and demand. To economically schedule the supply, an accurate load forecast is needed. Traditionally, load forecast was generated using the historical consumption patterns, weather forecast and other similar parameters. With the potential of high-penetration of DR, it may be necessary to incorporate the planned or forecasted DR levels into the load forecast. Also, DR capabilities can be used to support the power system capacity or emergency supply (ancillary service) needs. Such services depend upon proper scheduling and monitoring capabilities.

A demand response event may be initiated by a power system operator in response to a reliability event, e.g., loss of a generating station causing a lack of supply to meet demand, or an uncontrolled set of PEVs overloading of a distribution transformer. A demand response event may also be initiated by utility operational systems based on economic considerations, e.g., reducing or shifting peak load at the system level or at specific feeder or facility. Demand response may also be initiated by a customer in response to a market pricing signal

The distribution grid in the US is typically a three-phase imbalance circuit, i.e., many customers are on a single-phase or two-phase of the three-phase system. Thus significant changes in customer load patters could result in undesirable imbalanced conditions on a feeder. Also, load pickup following the termination of a major DR event could possibly cause overloads and other operational problems, if the load pickup is not properly scattered/managed.



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The following provides three representative use cases to highlight some the key interactions. These include:

- Dynamic Price-based DR
- Notification-based DR
- Direct Load Control

REQ.17.3.12.13.1 DR Execution – Retail Time Pricing (RTP)

REQ.17.3.2.13.1.1 Description

Real-time or dynamic pricing (RTP) may be provided to retail customers so that customers can vary their demand based on pricing signals. RTP represents retail electricity rates that vary as a function of time

Traditionally, retail tariff has based on a fixed or tiered rate structure with possible considerations of static rates for pre-established time of use (TOU) conditions. Real time or dynamic pricing (RTP) represent retail electricity rate that could vary as a function of time and is intended to modify demand. It requires interval metering for accurate billing based on time-varying prices. A number of states have implemented RTP or other dynamic pricing tariffs for large customers. With a broader deployment of advanced meters, RTP rates may become more common nation-wide.

The scenario presented here represents a case where a location-dependent real-time retail pricing for energy is established based on the Locational Marginal Price (LMP) for that location. LMP values are typically established by an ISO (for regions covered by an ISO/RTO) on a day-ahead (hourly resolution) and real-time basis, typically on a five minute resolution. For the RTP, it may be appropriate to use the real-time LMP as the basis for computing the retail dynamic tariff. However, decisions should be made on the time and the spatial resolution of the RTP. For example, an hourly RTP averaging the five minute pricing values, or a Critical Peak Pricing model to reflect the extreme conditions only, may be adopted. In addition to the energy price, the retail RTP rate may also include the appropriate uplift charges to cover for distribution wire/services charges and for the power loss compensations. Note that the uplift charges are typically subject to a regulatory review and approval.

Special care must be given to the RTP rate design to ensure customer acceptance and adaptation. Also grid operational



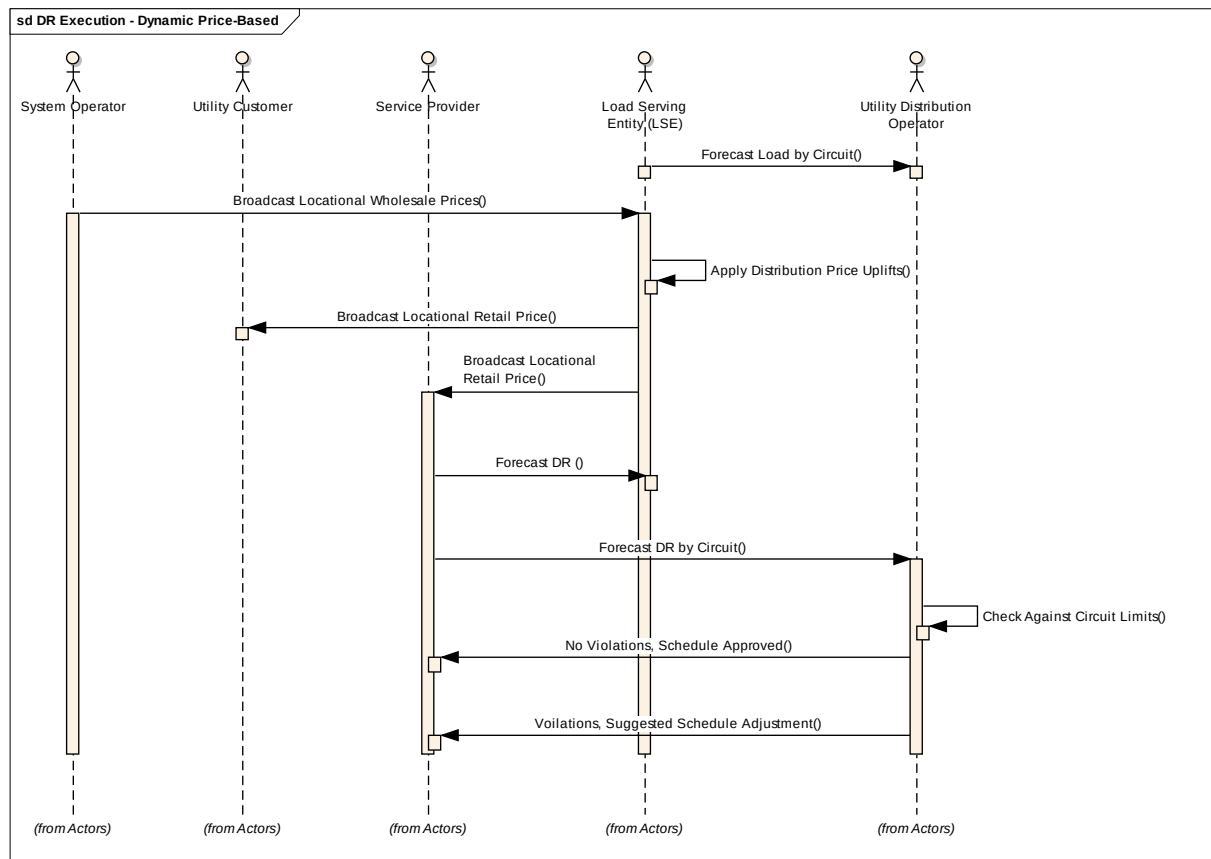
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issues may have to be addressed. For example, during low LMP (RTP) periods (e.g., at night), certain distribution circuits may get over loaded (congested), with customers shifting consumption, e.g., charging PEVs, to that period. This improves the overall system economy, but may cause circuit congestion. To combat this, some have proposed use of demand charges or an additional incentive payment for load reduction, a locational incentive to relief congestion.

REQ.17.3.2.13.1.2

Sequence Diagram





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REQ.17.3.2.13.2 DR Execution – Notification Based

REQ.17.3.2.13.2.1 Description

Notification-based DR is mostly used for economic purposes based on a day-ahead or hours or hour-ahead basis. Notification-based DR may also be used for reliability events when the system operator expects a contingency or operating condition (e.g., congestion or planned outage) on the distribution or the transmission grid that requires a reduction (or an increase) on the load at a given location.

Considering that the business processes for demand response have not yet been standardized across the nations, the following is a representative scenario that captures some of the interactions between the key stakeholders (actors).

At high penetration levels, the DR operation, especially on a day-ahead or hour ahead basis, should be coordinated with the overall operations and supply scheduling process. As is shown in the Sequence Diagram below, this may require a timely update of the “locational” load forecast and an up-to-date nomination of the DR capabilities. This information may be supplied to the “system” and/or market operator to be incorporated in the overall supply and demand scheduling process. The DR capabilities are specified by the DR Provider to the System Operator based on a DR Program, a price curve, or other nomination protocol. The DR Provider may also inform the Load Serving Entity (LSE) of the locational available DR capabilities.

The notification-based DR dispatch process is typically initiated by the System or Market Operator; the process may also be initiated by an LSE or UDO. It is also possible that the DR Provider be the initiator of the DR process based on a market opportunity (economic operation) or based on a pre-established program.

At high DR penetration levels, it is expected that the DR provider will clear the DR schedule with the Distribution Grid Operator, the UDO. This is to help ensure that the high penetration DR has no adverse impact on the distribution grid reliability and power quality, e.g., cause of excessive imbalances, voltage violation, or an overload during load pickup period. The UDO, in a timely fashion, should inform the DR Provider, if the schedule is cleared or requires an adjustment. Please note that if the DR deployed by a utility company that includes both LSE and UDO functions, such coordination is typically performed within the company's



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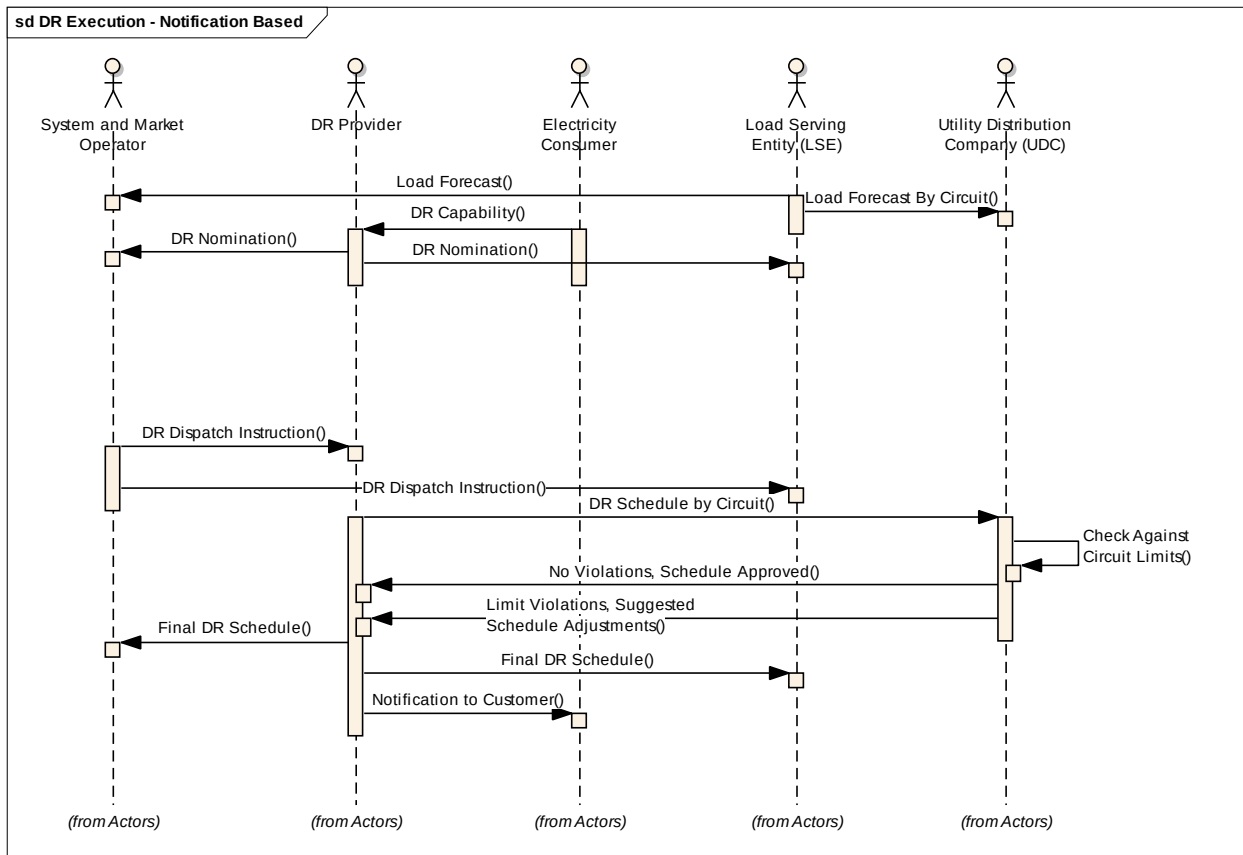
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operational systems (e.g., DRMS, DMS, etc.), or it can be an integral part of the DR scheduling application.

Following the clearing the DR schedule, notifications are sent to customers for DR operation. Under this scenario, the Market Operator and the LSE are also informed of the final DR schedule.

REQ.17.3.2.13.2.2

Sequence Diagram





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REQ.17.3.2.13.3 DR Execution – Direct Load Control (DLC)

REQ.17.3.2.13.3.1 Description

Direct-Load Control is typically used for reliability-based events such as contingency and emergency support, supply of balancing energy or other ancillary service. Many of these programs may require quick response time, e.g., five minutes or faster, that may be enabled through a DLC capability. Direct-Load Control may also be used for economic operations, e.g., water heater programs to reduce or shift peak load.

Considering that the business processes for demand response have not yet been standardized across the nations, the following is a representative DLC scenario that captures sample interactions between the key stakeholders (actors).

Direct Load Control is typically called for by a system operator, a transmission or distribution operator. It could be also issued by a Market Operator based on an ancillary service DR award, or by an LSE or DRP for an economic purpose. At high penetration levels, DLC operation should be coordinated with the distribution grid operator, the UDO.

As is shown in the sequence diagram below, the customer DR capabilities are aggregated by location and specified/nominated to the Distribution Grid Operator, Load Serving Entity, and/or to the System/Market Operator. In addition to location, the capabilities may also be aggregated by the DR response time, e.g., four seconds, five minutes, 30 minutes, etc.

The DLC Dispatch process typically is initiated by the Transmission or Distribution Operator. The process may also be initiated by the Market Operator or the LSE. The actual control of the DR resources may be done by the DR provider based on the dispatch signal received.

At high DR penetration levels, it is expected that the DLC activation schedule to be coordinated with the Distribution Grid Operator, the UDO. This is to help ensure that there are no adverse impact on the distribution grid reliability and power quality, e.g., voltage violation, excessive phase imbalances, or an overload during load pickup period. If the DLC is deployed by a utility company such coordination can be accomplished within the company's DR and distribution management systems, or performed as an integral part of the DR control functions.



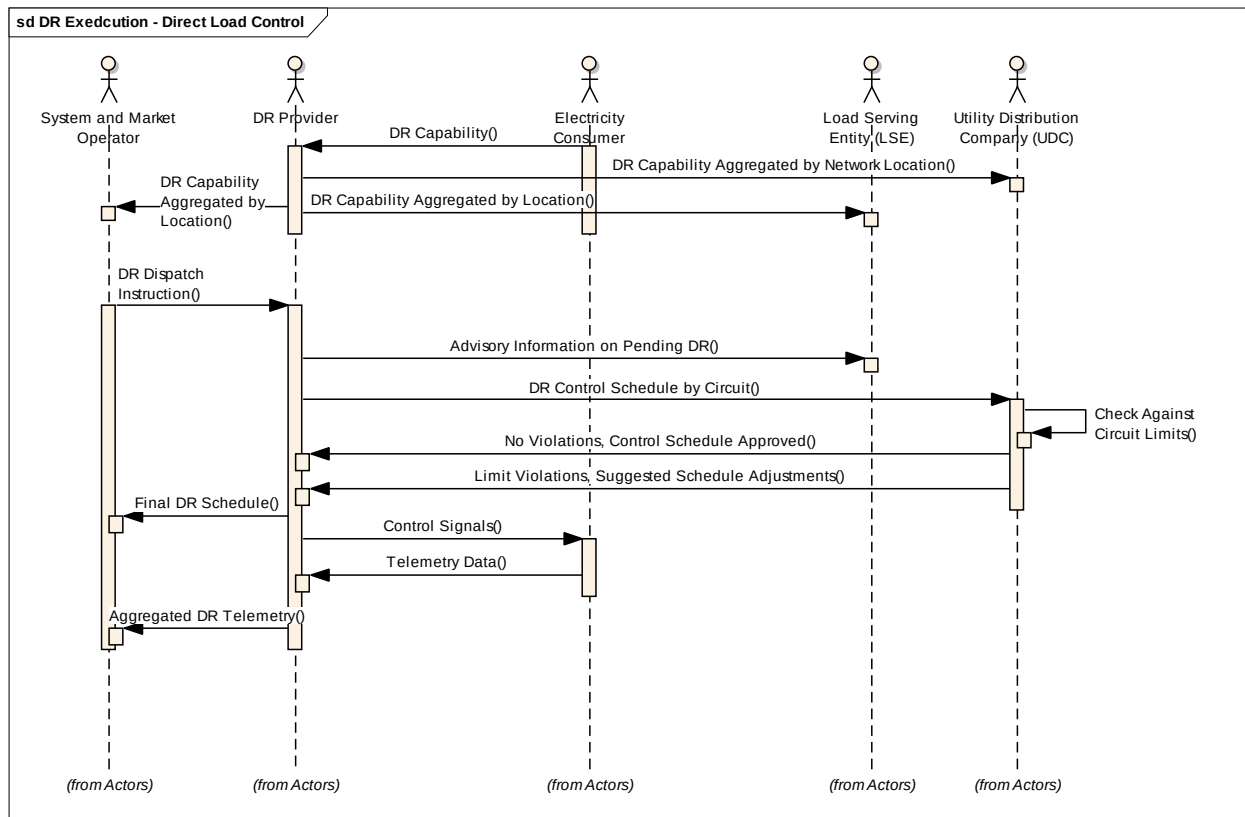
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For a “fast” DR, e.g., provision of ancillary services, a telemetry capability may be required to enable the real-time monitoring of the resource condition and its response to the DR control signal.

REQ.17.3.2.13.3.2

Sequence Diagram



REQ.17.3.2.14 Operational Coordination

Due to the existing differences in the regional retail energy market regulations, wholesale market structure and protocols, and supply and demand conditions, currently there are regional differences in business practices and processes governing demand response. As a result, operational coordination requirements for demand response would vary from region to region, depending on the available retail tariff, retail market structure, available wholesale market for DR and the market mechanics.

The following table summarizes the major roles and responsibilities of the typical key stakeholders with respect to demand response operation. As can be seen in this table, a significant level of stakeholder coordination may be required for an end-to-end DR



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operation spanning from the wholesale markets to the end-use customers.

Stakeholder	Sample Key Roles
Wholesale Market Operator	- Establish, administer, and operate wholesale demand response programs and markets; - Determine and publish locational prices for wholesale demand response products; - Improve energy market efficiencies (economics) by integrating demand response products and capabilities; - Monitor compliance to wholesale DR instructions and financially settle with the participating stakeholders.
Transmission Grid / System Operator - Balancing Authority	- Monitor and maintain transmission grid reliability, and call upon wholesale demand-side (demand response) capabilities to address contingency/emergency conditions; - Dispatch demand-side capabilities to balance supply and demand, e.g., mitigating impact of variable generation (e.g., wind). - In regions with no organized wholesale energy market, economically dispatch available generation and demand resources including demand response to optimize supply economics.



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Stakeholder	Sample Key Roles
Distribution Grid Operator – Utility Distribution Company	- Monitor and maintain the distribution grid reliability and the quality of power supply (e.g., voltage levels). Call upon DR to mitigate the distribution contingencies and reliability concerns. - Review and approve the integration of distributed energy resources with the distribution grid. - Assess the operational impact of distributed resources and demand response (DR/DER) on power quality and reliability of the distribution grid, approve high-penetration DR schedules (especially cold-load pickup operation). - Coordinate with the respective Load Serving Entity and Energy Service Providers for the assessment of distribution service and loss compensation charges to retail customers.
Load Serving Entity	- Forecast load and economically schedule supply to meet demand at all times. Incorporate demand response capabilities to improve load factor, reducing/shifting peak load. - Establish and obtain regulatory approval for a retail tariff for various customer classes. For real-time dynamic pricing (RTP) tariff, apply distribution service, loss compensation and other uplifts to the wholesale locational prices. - Establish and administer demand response and distributed resource management programs including DR tariff. - Meet regional requirements for Renewable Portfolio Standards compliance for power delivery. - Aggregate and schedule DR capabilities in wholesale markets, manage DR programs. - Manage customer metering and billing process.



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Stakeholder	Sample Key Roles
Power Marketer	- Forecast load and economically schedule supply to meet demand. Incorporate demand response capabilities to improve load factor, reducing/shifting peak load. - Establish and obtain regulatory approval for a retail tariff for various customer classes. For real-time dynamic pricing (RTP) tariff, apply distribution service, loss compensation and other uplifts to the wholesale locational prices. - Operate a wholesale and/or retail demand response programs with wholesale and/or retail customers.
Energy Service Provider	- Operate only in regions with competitive retail market - Be an alternative supplier of electric power to end-use customers by offering competitive products, services and prices. - Forecast aggregated load of the enrolled customers by location as required. - Coordinate the power supply with the respective LSE and UDO. - Support demand response programs (DR/DER) for enrolled customers. - Aggregate demand and demand-side capabilities; schedule the aggregated load and DR capabilities in wholesale markets. - Provide for DR telemetry and other monitoring requirements, on a resource or aggregated basis. - Apply the necessary uplifts (e.g., distribution service and loss compensation charges) to the wholesale locational prices. - Help meet regional requirements for Renewable Portfolio Standards compliance for power delivery. - Bill and settle with customers for energy supply and DR operation.



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Stakeholder	Sample Key Roles
Demand Response Provider	• Offer demand response services to the end-use customers. • Design and manage DR programs, establish pricing structure and signals for DR operation • Aggregate demand and demand-side capabilities; and offer/schedule these capabilities with the respective LSE or the wholesale market. • Provide for DR telemetry and other monitoring requirements, on a resource or aggregated basis. • Bill and settle with customers for energy supply and DR operation.
Electricity Customer	• Subscribe to a DR program, and update DR availability and capability information as appropriate • Maintain DR resources, data communications, telemetry, metering and control devices as may be required. • Respond to pricing signals, DR notifications, or control signals as appropriate.

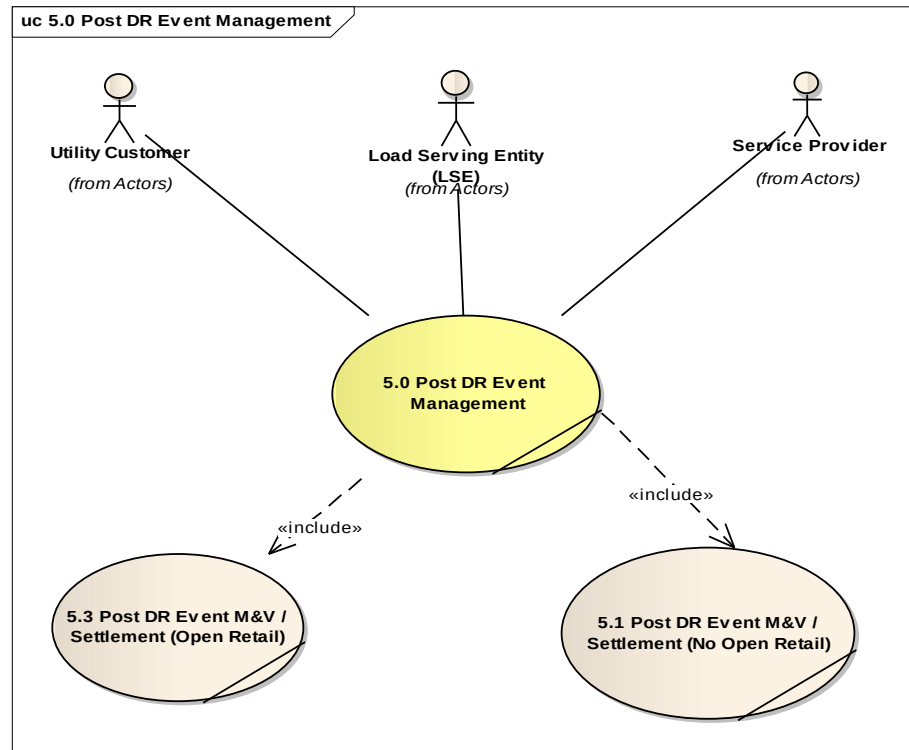


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REQ.17.3.2.15 Post DR Event Management

Post DR event management mainly concerns with the reconciliation of the actual consumption of energy within the duration of a DR event with the expected behavior so that proper financial reward or penalties could be carried out. The following use cases describe post DR event management for three different market types.





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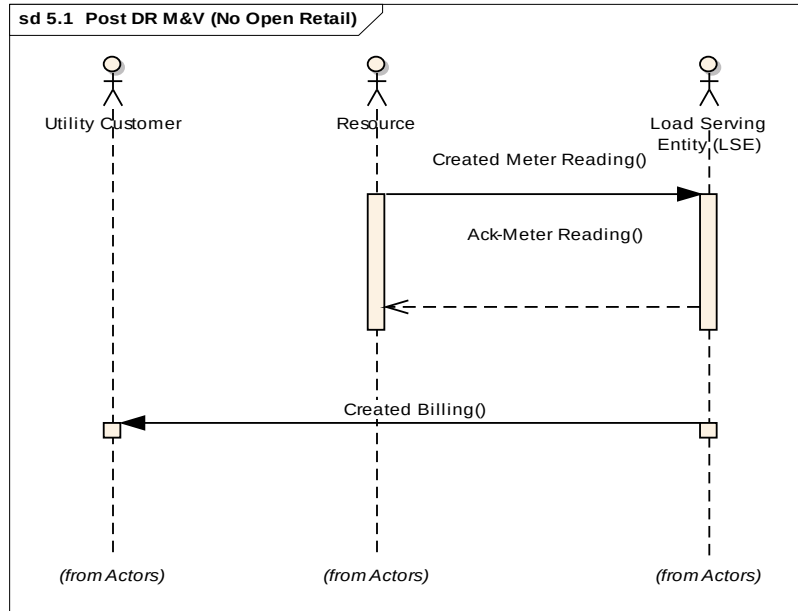
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REQ.17.3.2.15.1 Post DR Event M&V / Settlement (No Open Retail)

REQ.17.3.2.15.1.1 Description

After DR Event has been completed, then Measurement and Verification (M&V) can confirm whether action has been taken or to measure the impact of the response. After the M&V, then the Financial Settlement may be calculated and sent to the Electricity Customer⁵. This Use Case covers the scenarios with no Open Retail Markets.

REQ.17.3.2.15.1.2 Sequence Diagram



⁵ In wholesale markets, the settlement for a DR Event is between the System Operator and Market Participant and possibly between the Market Participant and the Electricity Customer.



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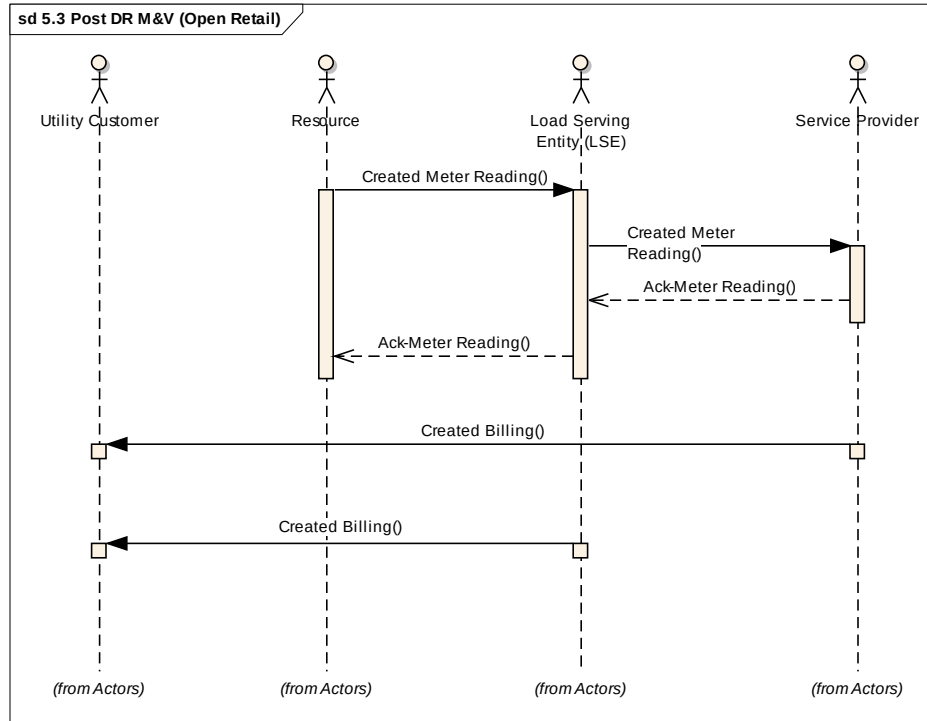
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REQ.17.3.2.15.2 Post DR Event M&V / Settlement (Open Retail)

REQ.17.3.2.15.2.1 Description

After DR Event has been completed, Measurement and Verification (M&V) can confirm action has been taken or to measure the impact of the response. After the M&V, the Financial Settlement can be calculated and sent to the Electricity Customer. This Use Case covers the scenarios with Open Retail Markets.

REQ.17.3.2.15.2.2 Sequence Diagram





RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for
 Retail Standard DR Signals – for NIST PAP09

REQ.17-A Appendix A – Entity-Relationship Model

The following terms and definitions correspond to a set of actor and objects within the overall information model for demand response. Figure 1A contains a data model used to illustrate the entity-relationships within the model. Abbreviations/Acronyms correspond to the IDs shown in the figure.

Proper (and Improper) Usage of the Entity-Relationship Model. The entity-relationship model is used to show cardinality among objects in the model, for example every Resource belongs to one and only one Service Provider and a Service Location contains one or more Service Delivery Points. The entity-relationship model does not provide use case information; actors are objects in the model and do not “act” in the model. The entity-relationship model does not imply process. For example, a Service Provider is associated with many Resources; however the enrollment of those Resources may be managed by a System Operators or a Utility Distribution Operator. Both use cases and process maps are separate components of the Model Business Practices.

Reading Crow’s Foot Notation. Objects in the model which share a relationship are connected with a cardinality line. Each end of the cardinality line contains a Crow’s Foot notation, as documents in the legend of the figure. The four notations utilized are “exactly-one”, “one-or-more”, “zero-or-one”, and “zero-or-more”. The cardinality line is bi-directional; meaning it can be read in two directions. For example: a Service Location is related to one-or-more Service Delivery Points (reading top to bottom) and every Service Delivery Point is related to exactly-one Service Location (reading bottom to top).

Optional Entities, Roles and Objects. The entity-relationship model is designed to support multiple business models and not every business model will require all entities, roles and/or objects to function. Therefore, entities, roles and objects in the model are considered optional. For example, a Utility Distribution Operator may design a Demand Response program which requires the definition of Resources and Service Locations, but does not require Asset Groups and Assets.

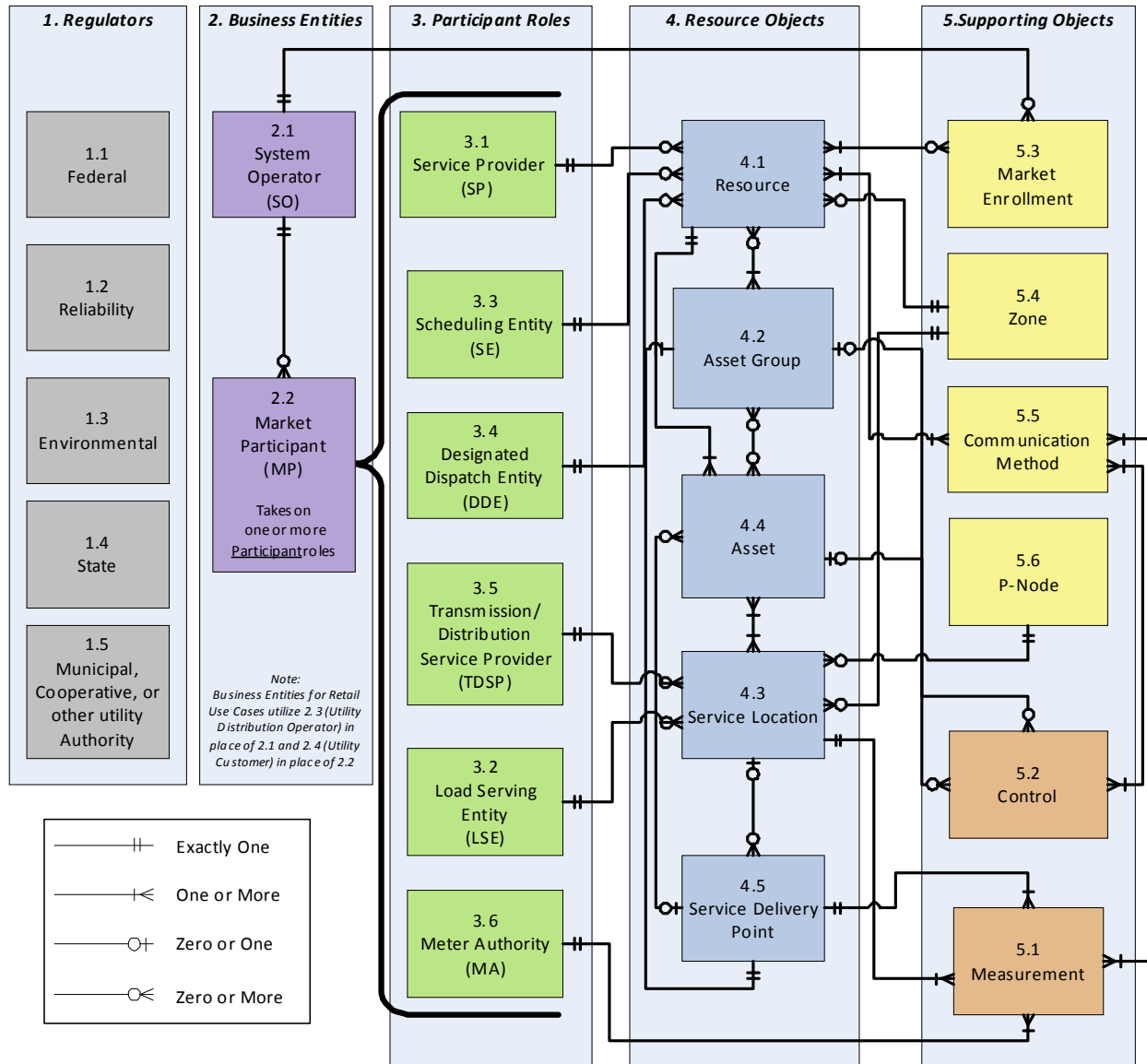
Applicability to Retail and Wholesale. The entity-relationship model is applicable to both wholesale and retail. When using the model for wholesale, the [typical](#) applicable business entities are 2.1 (System Operator) and 2.3 (Market Participant), while in retail markets, the parallel business entities are 2.3 (Utility Distribution Operator) and 2.4 (Utility Customers). Other than the swapping of the two pairs of terms, the models are identical, including the names of and relationships among objects.



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Figure 1A. Sample Entity-Relationship Model for Smart Grid Use Cases





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Retail Standard DR Signals – for NIST PAP09

4. Supporting Documentation

a. Description of Request:

REQ Annual Plan Item 9(c) – “Develop Requirements and Use Cases for PAP 09 – Demand Response/Distributed Energy Resources”

b. Description of Recommendation:

This recommendation provides the data elements related to the use cases developed as part of the phase one effort

c. Business Purpose:

This recommendation has been developed in response to a request from NIST to provide use cases and requirements germane to the development of standard DR and DER signals.

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):

NAESB Smart Grid Standards Subcommittee Meeting Notes/Documents:

- March 11, 2010 Meeting Notes – To be posted
- March 18, 2010 Meeting Notes – To be posted
- March 25, 2010 Meeting Notes – To be posted
- April 1, 2010 Meeting Notes – To be posted
- April 8, 2010 Meeting Notes – To be posted
- April 29, 2010 Meeting Notes – To be posted
- May 13, 2010 Meeting Notes – To be posted
- May 20, 2010 Meeting Notes – To be posted
- June 10, 2010 Meeting Notes – To be posted
- June 17, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd061710notes.doc
- July 1, 2010 Meeting Notes – To be posted
- July 13-14, 2010 Meeting Notes – To be posted
- July 22, 2010 Meeting Notes – To be posted
- August 5, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd080510notes.doc
- August 12, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd081210notes.doc
- August 26, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd082610notes.doc

**RECOMMENDATION TO NAESB EXECUTIVE COMMITTEE**

For Quadrant: Retail Electric Quadrant
Requesters: Smart Grid Interoperability Panel
Request No.: 2010 Retail Annual Plan Item 9(c)
Request Title: Phase Two Requirements Specification for
Retail Standard DR Signals – for NIST PAP09

- September 9, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd090910notes.doc
- September 16, 2010 Meeting Notes –
http://www.naesb.org/pdf4/smart_grid_ssd091610notes.doc
- September 23, 2010 Meeting Notes – To be posted



**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

Requesters: DSM-EE Subcommittee
Request No.: 2010 Retail Annual Plan Item No. 3.c
Request Title: Phase 2: M&V for Demand Response Programs

1. RECOMMENDED ACTION:

☒ Accept as requested
☐ Accept as modified below
☐ Decline

**EFFECT OF EC VOTE TO ACCEPT
RECOMMENDED ACTION:**

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☐ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☐ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The DSM-EE Subcommittee submits this Recommendation for 2010 Retail Annual Plan Item No. 3.c to support phase 2, retail development of Model Business Practices for Measurement & Verification (M&V) for Demand Response programs.



**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

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Request No.: 2010 Retail Annual Plan Item No. 3.c
Request Title: Phase 2: M&V for Demand Response Programs

RECOMMENDED STANDARDS:

MEASUREMENT & VERIFICATION (M&V) OF DEMAND RESPONSE PROGRAMS

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**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

Requesters: DSM-EE Subcommittee
Request No.: 2010 Retail Annual Plan Item No. 3.c
Request Title: Phase 2: M&V for Demand Response Programs

Executive Summary

This section provides a common framework of the Model Business Practices for Measurement and Verification (M&V) of Demand Response programs in retail ~~energy~~-electric markets. The purpose of these Model Business Practices is to provide:

- Transparency: accessible and understandable M&V ~~requirements~~-protocols for Demand Response programs
- Accountability: criteria that will enable the Program Administrator to accurately ~~estimate load impacts~~ ~~measure performance~~ of Demand Response Resources; and
- Consistency: a process or protocol that will allow Program Administrators, Applicable Regulatory Authorities, or program participants to agree on the required steps to take to verify demand reductions resulting from Demand Response programs in retail energy markets.
- Comprehensive: strives to cover all forms of Demand Response

The purpose of this Standard is to ensure that regulatory commissions and participants in retail electric markets in which dispatchable Demand Response products are administered have access to uniform ~~Measurement and Verification protocols~~information that will enable them to ~~develop report~~ consistent values for ~~Measurement and Verification~~the load impact estimates of the programs.

These Model Business Practices were designed in concert with Wholesale Electric Quadrant Standards covering Demand Response programs operating in wholesale electric markets. In the event of a conflict between these business practices and business practices developed by the Wholesale Electric Quadrant for products that are bid into wholesale markets, the Wholesale Electric Quadrant Standard should have precedence. Additionally, all Entities supplying Demand Response Services should comply with applicable North American Electric Reliability Corporation(NERC) reliability standards.



**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

Requesters: DSM-EE Subcommittee
Request No.: 2010 Retail Annual Plan Item No. 3.c
Request Title: Phase 2: M&V for Demand Response Programs

Introduction

The North American Energy Standards Board (NAESB) is a voluntary non-profit organization comprised of members from all aspects of the natural gas and electric industries. Within NAESB, the Retail Electric Quadrant (REQ) and the Retail Gas Quadrant (RGQ) focus on issues impacting the retail sale of energy to end-use customers. REQ / RGQ Model Business Practices are intended to provide guidance to Distribution Companies, Suppliers, and other Market Participants involved in providing energy service to end-use Customers. The focus of these Model Business Practices is performing M&V for Demand Response programs and is not intended to address Demand Response program design. These Model Business Practices are intended to be consistent with the Wholesale Electric Standards, but also acknowledge differences in product and program types between the two markets.

These Model Business Practices are voluntary and do not address policy issues that are the subject of state legislation or regulatory decisions. These Model Business Practices have been adopted with the realization that as the industry evolves, additional and amended Model Business Practices may be necessary. Any industry participant seeking additional or amended Model Business Practices (including principles, definitions, data elements, process descriptions, and technical implementation instructions) should submit a request to the NAESB office, detailing the change, so that the appropriate process may take place to amend the Model Business Practice.



**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

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Request Title: Phase 2: M&V for Demand Response Programs

Business Processes and Practices

MEASUREMENT & VERIFICATION (M&V) OF DEMAND RESPONSE PROGRAMS

REQ.13 Overview

These M&V Model Business Practices establish criteria for the use of equipment, technology, and procedures to quantify the Demand Reduction Value delivered [from retail demand response programs \(product types\)](#). Model Business Practices developed may include commonalities among product types. The following outline of Model Business Practices is applicable to the Demand Response products.

General	Advance Notification
	Deployment Time
	Reduction Deadline
	Release/Recall
	Normal Operations
	Demand Resource Availability Measurement
	Aggregation
	Transparency of Requirements
Telemetry	Telemetry Requirement
	Telemetry Accuracy
	Telemetry Interval
	Other Telemetry Measurements
	Communication Protocol
	Governor Control Equivalent
	On-Site Generation Telemetry Requirement
After-The-Fact Metering	After-the-Fact Metering Requirement
	Meter Accuracy
	Details of Meter/Equipment Standards
	Meter Data Reporting Deadline
	Meter Data Reporting Interval
	Clock / Time Accuracy
	Validating, Editing & Estimating (VEE) Method
	On-Site Generation Meter Requirement
Performance Evaluation	Rules for Performance Evaluation



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For ~~each~~ Demand Response ~~service~~products, a performance evaluation methodology is used to determine the Demand Reduction Value provided by a Demand Resource. The Model Business Practices include descriptions of acceptable Baselines and alternative performance measurements that are appropriate for each type of Demand Response ~~service~~products. The table below provides an outline of the applicable criteria for performance evaluation methodologies.

Baseline Information	Baseline Window
	Calculation Type
	Sampling Precision and Accuracy
	Exclusion Rules
	Baseline Adjustments
	Adjustment Window
Event Information	Use of Real-Time Telemetry
	Use of After-The-Fact Metering
	Performance Window
	Measurement Type
Special Processing	Highly-Variable Load Logic
	On-Site Generation Requirements

These Model Business Practices do not specify detailed characteristics of performance evaluation methodologies, but rather provide a framework that may be used to develop performance evaluation methodologies for specific Demand Response services. This approach is believed to be most appropriate at this time as development of performance evaluation methodologies and baseline calculations continues to mature. The following methodology types are applicable to retail Demand Response products:

- Maximum Base Load
- Meter Before / Meter After
- Baseline
- Metering Generator Output



**NAESB REQ Recommendation
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Request Title: Phase 2: M&V for Demand Response Programs

REQ.13.1 Principles

- REQ.13.1.1** The processes for M&V of Demand Response programs should be efficient to minimize the time and effort needed to accomplish these operational details.
- REQ.13.1.2** The processes for M&V of Demand Response programs should be consistent with the requirements set forth by the Applicable Regulatory Authority.
- REQ.13.1.3** The processes for M&V of Demand Response programs should minimize the occurrence of unauthorized activity in the marketplace.
- REQ.13.1.4** A contract or agreement between participants may establish different processes, timeframes, or operational requirements. Any conflict between these recommended processes and an applicable contract is resolved according to the provisions of the contract.
- REQ.13.1.5** These processes do not address contractual obligations between participants and their Customers, but because they are intended to be business practices, entities may incorporate them into contractual arrangements.
- REQ.13.1.6** All Customer specific data must remain confidential unless the parties otherwise agree.



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REQ.13.2 Definitions

REQ.13.2.A Business Definitions

REQ.0.2.145 Adjustment Window: The period of time prior to a Demand Response Event used for calculating a Baseline Adjustment.

REQ.0.2.146 Advance Notification(s): One or more communications to Demand Resources of an impending Demand Response Event in advance of the actual event.

REQ.0.2.147 After-the-Fact Metering: Interval meter data separate from Telemetry that is used to measure Demand Response. May not apply to Demand Resources under Baseline using statistical sampling.

RXQ.0.2.1 Applicable Regulatory Authority: The state regulatory agency or other local governing body that provides oversight, policy guidance, and direction to any parties involved in the process of providing energy to ~~retail access~~ Retail Customers through regulation and orders.



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REQ.0.2.148 Baseline: A method of estimating the electricity that would have been consumed by a Customer or Demand Resource in the absence of a Demand Response Event. It may be calculated using interval metering and/or statistical sampling techniques. The figure below illustrates the concept of Baseline relative to a Demand Response Event.

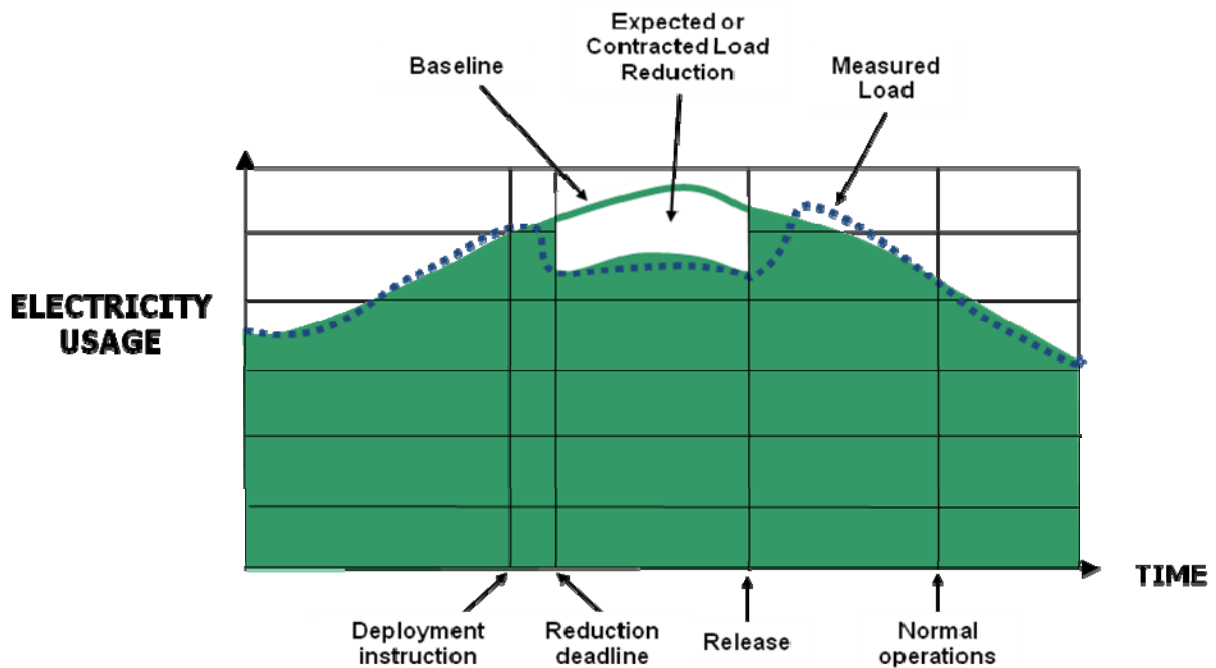


Figure 1. Illustration of Baseline Concept.

REQ.0.2.149 Baseline Adjustment: ~~An adjustment that modifies~~ A modification to the Baseline to ~~reflect actual account for~~ conditions immediately prior to or during a Demand Response Event to provide a better estimate of the energy the Demand Resource would have ~~consumed~~ used but for the Demand Response Event. The adjustments may include but are not limited to weather conditions, near real time event facility Load, current Demand Resource operational information, or other parameters based on the Program Administrator's requirements.

REQ.0.2.150 Baseline Window: ~~The window~~ A period of time preceding and optionally following a Demand Response Event over which the electricity ~~consumption~~ usage data is collected for the purpose of establishing a Baseline.



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- REQ.0.2.151 Capacity Service:** A type of Demand Response service in which Demand Resources are obligated to control demand over a defined period of time measured in MW.~~over a defined period of time to be available to provide Demand Response upon deployment by the Program Administrator.~~
- REQ.0.2.152 Critical Peak Pricing:** A pricing structure in which the Customer receives notification identifying a time interval, ("critical hours") during which special higher prices apply over and above whatever other rate they may be charged. Critical hours generally represent a small percentage of the hours in the year.~~Rates which typically charge a much higher price during a few hours per day on critical peak days. The number of critical peak days is usually capped for a calendar year and is linked to conditions such as system reliability concerns or very high supply prices.~~
- RXQ.0.2.16 Customer:** Any Entity that takes gas and/or electric service for its own consumption~~usage~~.
- REQ.0.2.153 Demand:** The rate at which electric energy is delivered to or by a system or part of a system, generally expressed in kilowatts or megawatts, at a given instant or averaged over any designated interval of time; and the rate at which energy is being used by the Retail customer.
- REQ.0.2.154 Demand Reduction Value:** Quantity~~Measurement~~ of reduced electrical Demand consumption electricity usage by a Demand Resource during a Demand Response Event,~~expressed in MW or MWh, respectively.~~
- REQ.0.2.155 Demand Resource:** A Load or aggregation of Loads capable of ~~measurably and verifiably~~ providing measurable and verifiable Demand Response.
- REQ.0.2.156 Demand Resource Availability Measurement:** The potential Demand Reduction Value~~The amount of Load~~ available to be dispatched for a given Demand Response Event.
- REQ.0.2.157 Demand Response:** A temporary change in electricity usage by a Demand Resource in response to market or reliability conditions. For purposes of these Model Business Practices, Demand Response does not include energy efficiency or permanent Load reduction.~~Changes in electric use by demand-side resources from their normal consumption patterns in response to changes in the price of electricity, or to incentives designed to induce lower electricity use at times of potential peak load, high cost periods, or when system reliability is jeopardized.~~

For purposes of these Model Business Practices, this definition does not include energy efficiency or permanent Load reduction.



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REQ.0.2.158 Demand Response Event: A period of time defined by the Program Administrator, including notifications, deadlines, and transitions, during which Demand Resources provide Demand Response. All notifications, deadlines, and transitions may not be applicable to all Demand Response products or services. The time periods, deadlines and transitions during which Demand Resources perform. The Program Administrator should specify the duration and applicability of a Demand Response Event. All deadlines, time periods and transitions may not be applicable to all Demand Response products or services.

The figure below represents the terms for timing events and time durations applicable to the characteristics of a dispatchable Demand Response Event. The definitions of the ten elements in the figure are the basis for describing the Timing of a Demand Response Event.

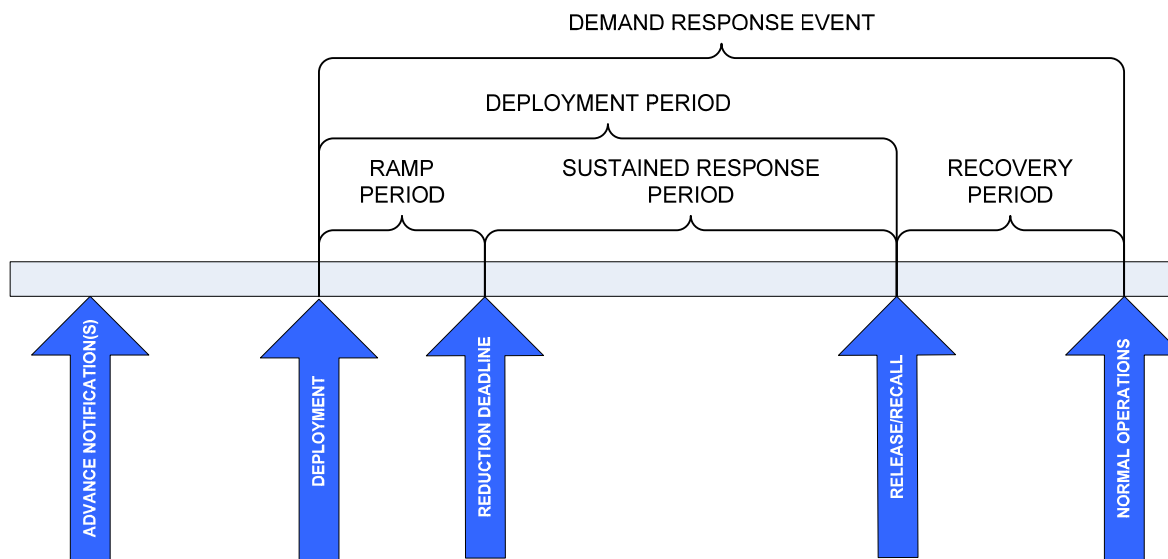


Figure 2. Timing of a Demand Response Event

REQ.0.2.159 Demand Response Provider: The Entity that is responsible for delivering Demand reductions from Demand Resources.

REQ.0.2.160 Deployment: The time at which a Demand Resource begins reducing Demand on the system in response to an instruction.

REQ.0.2.161 Deployment Period: The time in a Demand Response Event beginning with the Deployment and ending with the Release/Recall.

REQ.0.2.162 Direct Load Control: A Demand Response activity by which the program sponsor remotely shuts down or cycles a Customer's electrical equipment (e.g. air conditioner, water heater). Direct Load Control



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programs are primarily offered to residential or small commercial Customers.

REQ.0.2.163 Dispatchable Programs: Programs that allow a Program Administrator to declare a Demand Response Event that has a specific start time and end time.

RXQ.0.2.17 Distribution Company: A regulated Entity which provides distribution services and may provide energy and/or transmission / transportation services in a given area.

REQ.0.2.164 Energy Service: A type of Demand Response service in which a Demand Resource provides a quantity of electricity measured in MWhs. are compensated solely based on their performance during a Demand Response Event.

RXQ.0.2.47 Entity: A person or organization with sufficient legal standing to enter into a contract or arrangement with another such person or organization (as such legal standing may be determined by those parties) for the purpose of conducting and/or coordinating energy transactions.

REQ.0.2.165 Firm Service Level: Demand level that a Customer must not exceed during a Demand Response Event.

RXQ.0.2.22 Governing Documents: Documents that determine the interactions among parties, including but not limited to: applicable law, regulatory documents (e.g., tariffs, rules, regulations), contractual agreements, ~~and~~ Distribution Company Operational Manuals, and other relevant models and operational procedures.

REQ.0.2.166 Guaranteed Load Drop: Reduction of a specified amount of Load.

REQ.0.2.167 Highly-Variable Load: A Load with a fluctuating or unpredictable electricity consumption usage pattern.

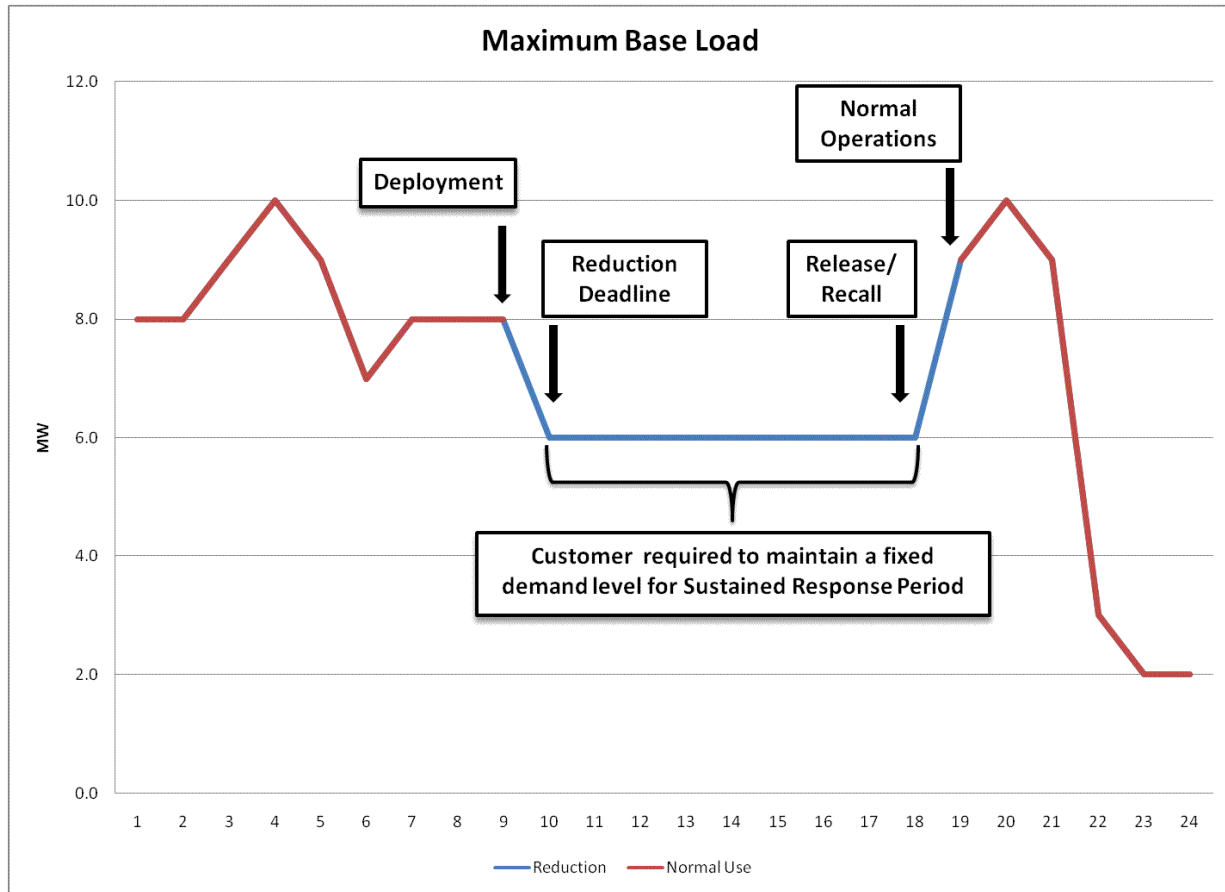
REQ.0.2.168 Load: An end-use device or customer that receives power from the electric system.



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REQ.0.2.169 Maximum Base Load: A performance evaluation methodology based solely on a Demand Resource's ability to maintain its electricity usage at or below a specified level during a Demand Response Event, reduce to a Firm Service Level, regardless of its electricity consumption or Demand at Deployment.





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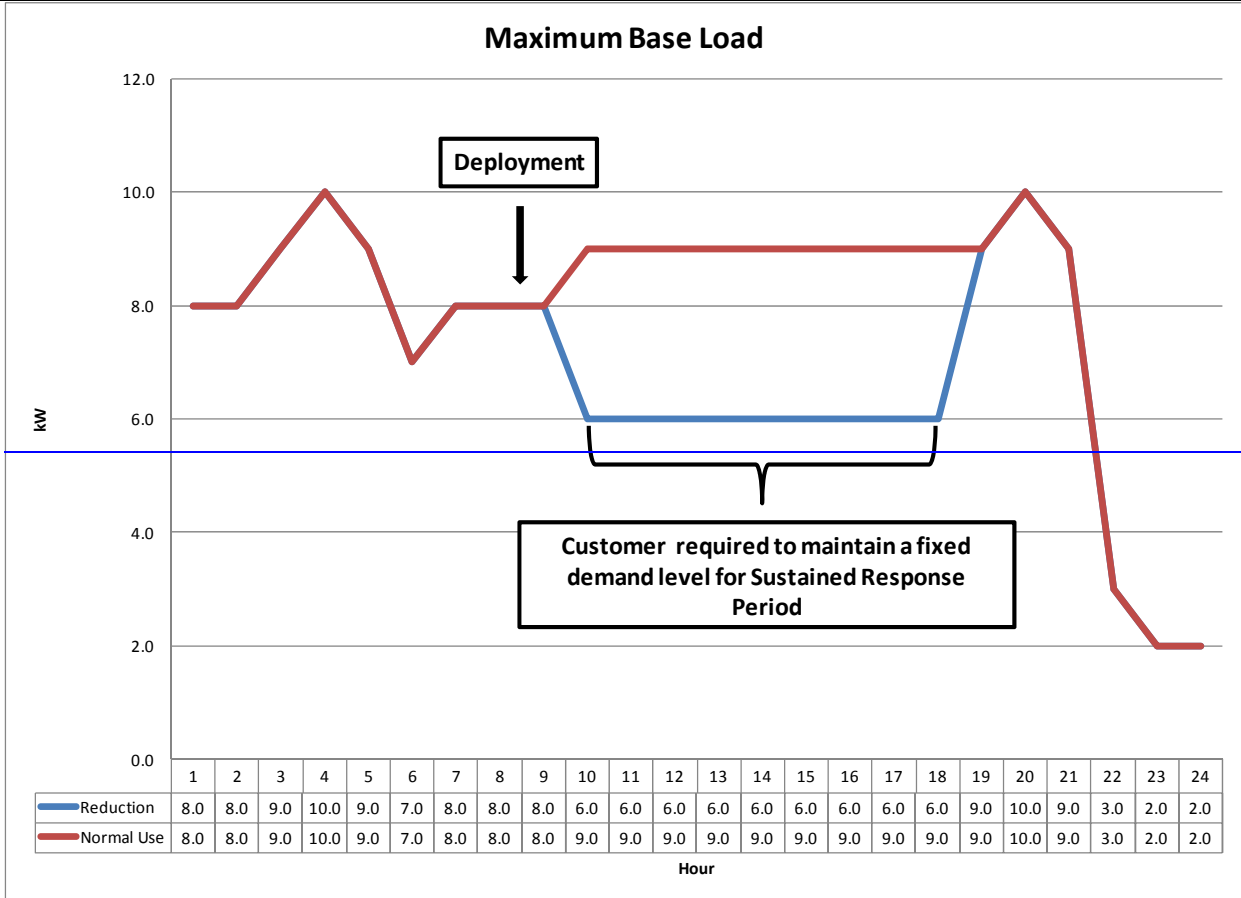


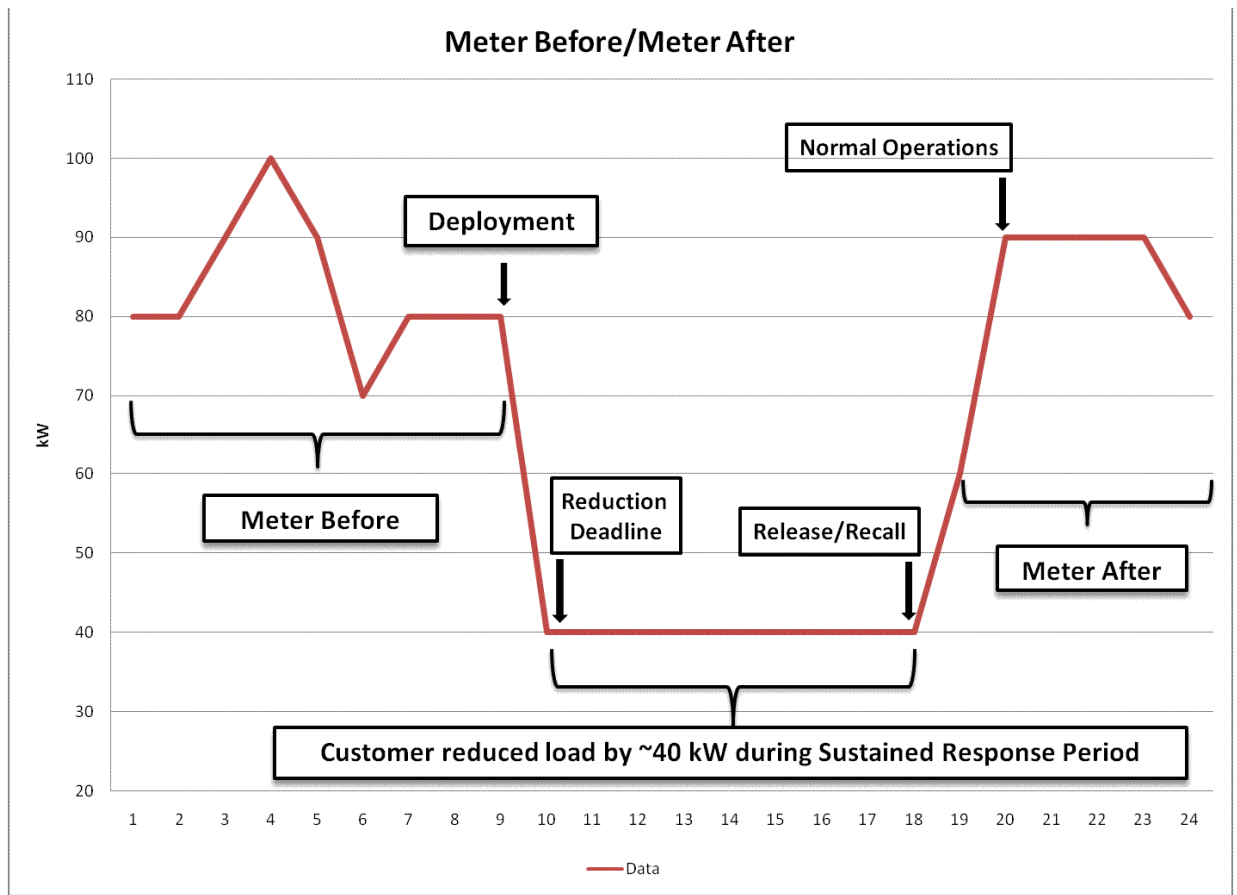
Figure 3. Maximum Base Load Illustration



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REQ.0.2.170 Meter Before / Meter After: A performance evaluation methodology where electricity Demand over a prescribed period of time prior to Deployment is compared to similar readings during the Sustained Response Period.





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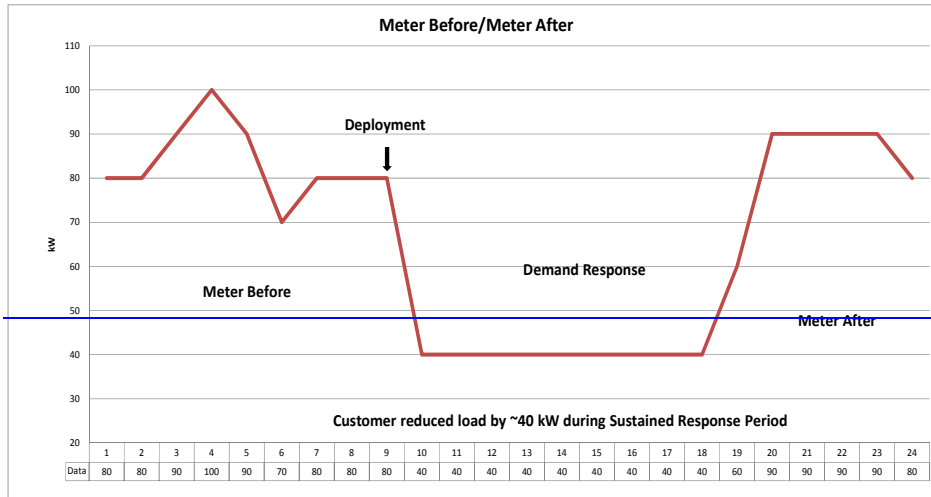


Figure 4. Meter Before/Meter After Illustration

REQ.0.2.171 Meter Data Recording Interval: The time between electricity meter ~~consumption~~ usage recordings.

REQ.0.2.172 Meter Data Reporting Deadline: The maximum allowed time from the end of a Demand Response Event (Normal Operations) to the time when meter data is required to be submitted for performance evaluation and settlement. The Meter Data Reporting Deadline may be either relative (a number of hours/days after Normal Operations) or fixed (a fixed calendar time, such as end-of-month).

REQ.0.2.173 Metering Generator Output: A performance evaluation methodology in which the Demand Reduction Value is based on the output of ~~the a generator generation asset, used when a generation asset is~~ located behind the Demand Resource's revenue meter.

REQ.0.2.174 Non-Dispatchable Programs: Programs in which Demand Resources curtail according to tariff structure, not in response to instructions from a Program Administrator.

REQ.0.2.175 Non-Spinning Reserve: Operating reserves that can be started, synchronized and loaded within a specified time period.

REQ.0.2.176 Normal Operations: The time following Release/Recall at which a Program Administrator may require a Demand Resource to have returned its Load ~~consumption~~ usage to normal levels, and to be available again for Deployment.



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- REQ.0.2.177 Operability Factor:** A net-to-gross percentage applied to the Demand Resource Availability Measurement, developed using a defined and documented testing protocol to verify both signal reception and device operation of the units in a retail Demand Response program, specific to a time period.
- REQ.0.2.178 Performance Window:** The period of time in a Demand Response Event analyzed by the Program Administrator to measure and verify the Demand Reduction Value for a Demand Resource.
- REQ.0.2.179 Program Administrator:** An investor-owned, governmental or cooperative utility with the responsibility for developing and operating Demand Response programs.
- REQ.0.2.180 Ramp Period:** The time between Deployment and Reduction Deadline, representing the period of time over which a Demand Resource is expected to achieve its change in Demand.
- REQ.0.2.181 Ramp Rate:** The rate, expressed in megawatts per minute, that a generator changes its output or a Demand Resource changes its Load.
- REQ.0.2.182 Real Time Pricing:** A retail rate in which the price for electricity fluctuates reflecting changes in the wholesale price of electricity.
- REQ.0.2.183 Recovery Period:** The time between Release/Recall and Normal Operations, representing the window over which Demand Resources are required to return to their normal Load.
- REQ.0.2.184 Reduction Deadline:** The time at the end of the Ramp Period when a Demand Resource is required to have met its Demand Reduction Value obligation.
- REQ.0.2.185 Regulation Service:** A type of Demand Response service in which a Demand Resource increases and decreases Load in response to real-time signals from the Program Administrator. Demand Resources providing Regulation Service are subject to dispatch continuously during a commitment period. Provision of Regulation Service does not correlate to [time periods, deadlines and transitions in the Demand Response Event timelines definition](#).
- REQ.0.2.186 Release/Recall:** The time when ~~athe~~ Program Administrator ~~notifies a Demand Resource that the~~[specifies a](#) Deployment Period has ended or will end.
- REQ.0.2.187 Spinning Reserve:** Operating reserves from resources that are synchronized to the grid and can respond to instructions from the Program Administrator.



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- REQ.0.2.188 Sustained Response Period:** The period of time between Reduction Deadline and Release/Recall over which a Demand Resource is required to deliver its obligated Demand Reduction Value, ~~representing the window over which a Demand Resource is required to maintain its reduced net consumption of electricity.~~
- REQ.0.2.189 Telemetry:** Equipment for measuring a quantity and transmitting the result to a remote location for measurement, monitoring, display or recording. ~~Real-time continuous communication between a Demand Resource or Demand Response Provider and the Program Administrator.~~
- REQ.0.2.190 Telemetry Interval:** The unit of time ~~unit~~ between communications of telemetered data, ~~between a Demand Resource or Demand Response Provider and a Program Administrator.~~
- REQ.0.2.191 Time-of-Use Rates:** Rates where usage unit prices vary by more than one time period within a 24-hour day to reflect the average cost of generating and delivering power during those time periods. Daily pricing blocks may include, but are not limited to, an on-peak, partial-peak, and an off-peak price for non-holiday weekdays, with the on-peak price as the highest price, and the off-peak price as the lowest price.
- REQ.0.2.192 Validation, Editing and Estimation:** The process of confirming the accuracy of raw meter data and, if necessary, replacing corrupt or missing data. VEE guidelines are published in the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering.



**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

Requesters:	DSM-EE Subcommittee
Request No.:	2010 Retail Annual Plan Item No. 3.c
Request Title:	Phase 2: M&V for Demand Response Programs



**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

Requesters: DSM-EE Subcommittee
Request No.: 2010 Retail Annual Plan Item No. 3.c
Request Title: Phase 2: M&V for Demand Response Programs

REQ.13.3 Model Business Practices

REQ.13.3.1 General Characteristics of a Demand Response Event

- REQ.13.3.1.1** All actions taken in a Demand Response Event should be in accordance with the Governing Documents.
- REQ.13.3.1.2** Advance Notification: The Program Administrator should specify any requirements for the Advance Notification.
- REQ.13.3.1.3** The Program Administrator should initiate Deployment of the Demand Resource(s) depending on the specific circumstance(s) of the Demand Response Event.
- REQ.13.3.1.4** The Reduction Deadline will depend on the specific circumstance(s) of the Demand Response Event and should be specified by the Program Administrator.
- REQ.13.3.1.5** Any requirement(s) for a Ramp Period or a specified Ramp Rate will depend on the specific circumstance(s) of the Demand Response Event and should be specified by the Program Administrator.
- REQ.13.3.1.6** The Release / Recall will depend on the specific circumstance(s) of the Demand Response Event and should be specified by the Program Administrator.
- REQ.13.3.1.7** Any requirement for a return to Normal Operations will depend on the specific circumstance(s) of the Demand Response Event and the Recovery Period should be specified by the Program Administrator.

REQ.13.3.2 Measurement of Load

- REQ.13.3.2.1** Demand Response resource value may be estimated via Telemetry or After-the-Fact Metering or both.
- REQ.13.3.2.2** After-the-fact measurement is required ~~and may be measured~~ either by metering each individual site or by statistical sampling.
- REQ.13.3.2.3** Meter accuracy should meet or exceed industry standards or as specified by the Applicable Regulatory Authority.
- REQ.13.3.2.4** Meters and other equipment should meet or exceed industry standards equivalent to ANSI C12 or as specified by the Applicable Regulatory Authority.
- REQ.13.3.2.5** The Meter Data Reporting Deadline should be specified in the Governing Documents.



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REQ.13.3.2.6 The Meter Data Recording Interval should be specified in the Governing Documents.

REQ.13.3.2.7 The meter clock / time accuracy should meet or exceed industry standards equivalent to ANSI C12 or as specified by the Applicable Regulatory Authority.

REQ.13.3.2.8 The method of Validating, Editing and Estimation should conform to an accepted methodology (such as the guidelines published in the current edition of the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering), and should be specified in the Governing Documents.

REQ.13.3.3 Statistical Sampling

REQ.13.3.3.1 The method of statistical sampling used should conform to an accepted methodology and should be specified in the Governing Documents. The following list provides examples of currently accepted methodologies:

- The Association of Edison Illuminating Companies (AEIC) Load Research Manual
 - Chapter 4 – Sample Design and Selection
 - Chapter 5 – Sample Implementation¹
- The Federal Energy Management Program M&V Guidelines: Measurement and Verification for Federal Energy Projects – Appendix B²;
- The California Energy Efficiency Evaluation Protocols³;
- The California Evaluation Framework – Chapter 13⁴; or
- The Independent System Operator (ISO)-New England Manual for Measurement and Verification of Demand Reduction Value from Demand Resources, Section 7⁵.

REQ.13.3.3.2 The general steps to be taken in statistical sampling are, but are not limited to:

- [Define the population](#)
- Design the sample to meet program objectives.

¹ Association of Edison Illuminating Companies (AEIC), *Load Research Manual*, 2nd ed., Birmingham, AL, 2001, www.aeic.org

² US Department of Energy. M&V Guidelines: Measurement and Verification for Federal Energy Management Projects Version 3.0. 2008. (http://www1.eere.energy.gov/femp/financing/superespces_measguide.html or [current version](#)).

³ California Public Utilities Commission, California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals, 2006. (<http://www.cpuc.ca.gov/PUC/>)

⁴ California Public Utilities Commission, The California Evaluation Framework, [2006 current version](#). (<http://www.cpuc.ca.gov/PUC/>).

⁵ ISO-New England, Manual for Measurement and Verification of Demand Resources, (M-MVDR), [2007 current version](#). (http://www.iso-ne.com/rules_proceeds/isone_mnls/index.html).



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- [Define the population](#)

- Specify the listing of units available to be sampled which is sometimes called the sampling frame
- Identify design (auxiliary) variables
- Choose the sampling technique
 - o Choose stratification variable(s)
 - o Select allocation procedure
 - o Estimate means and variances of loads
 - o Examine sample size requirements
 - o Select sampling techniques and design
- Determine the sample size
- Identify those units to be in the sample
 - o Identify the criteria for selecting those units to be substituted for sample units who decline
 - o Select sample and alternates
 - o Validate sample
- Contacting and enroll the Customers to be in the sample, and install the metering devices, [if needed](#)

- [Collect interval meter data.](#)

REQ.13.3.3.3 The sample drawn should comport to a level of statistical significance that supports the goals of the program

REQ.13.3.4 Performance Evaluation Methods

Performance is evaluated through the use of one of the following methods unless otherwise specified by the Program Administrator:

- Maximum Base Load
- Meter Before / Meter After
- Baseline
- Metering Generator Output

REQ.13.3.4.1 Maximum Base Load Evaluation

REQ.13.3.4.1.1 Any requirement for real-time Telemetry data to be used to measure performance should be specified by the Program Administrator.

REQ.13.3.4.1.2 Any requirement for After-The-Fact Metering should be specified by the Program Administrator.



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REQ.13.3.4.1.3 The Performance Window is the Sustained Response Period (Reduction Deadline through Release/Recall) unless otherwise specified by the Program Administrator.

REQ.13.3.4.1.4 During the Performance Window, the Demand Resource must maintain its electricity consumption at or below the Maximum Base Load. The criteria used to evaluate performance is one of the following unless otherwise specified by the Program Administrator:

- [Peak-Average](#) Demand
- [Average-Peak](#) Demand

REQ.13.3.4.2 Meter Before / Meter After Evaluation

REQ.13.3.4.2.1 The Program Administrator should specify the Baseline Window.

REQ.13.3.4.2.2 During the Baseline Window, the Demand [Reduction Value](#) of the Demand Resource is evaluated using one of the following measurements as specified by the Program Administrator:

- [Average Demand](#)
- Instantaneous Demand
- Maximum Demand

• ~~Average Demand~~

REQ.13.3.4.2.3 Statistical sampling is not used for this performance evaluation ~~type~~[method](#), unless otherwise specified by the Program Administrator.

REQ.13.3.4.2.4 The Program Administrator should specify any time periods to be excluded from Baseline Window.

REQ.13.3.4.2.5 The Program Administrator should specify any Baseline Adjustments.

REQ.13.3.4.2.6 No Adjustment Window is used for this model unless otherwise specified by the Program Administrator.

REQ.13.3.4.2.7 The Program Administrator should specify if real-time Telemetry data is to be used to measure performance.

REQ.13.3.4.2.8 After-The-Fact Metering should be used to measure performance, unless otherwise specified by the Program Administrator.



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REQ.13.3.4.2.9 The Performance Window is the Sustained Response Period (Reduction Deadline through Release/Recall) unless otherwise specified by the Program Administrator.

REQ.13.3.4.2.10 During the Performance Window, the Demand Resource is evaluated using the same method of development of the Demand Reduction Value as identified in REQ.13.3.4.2.2, one of the following measurements unless otherwise specified by the Program Administrator:

- Instantaneous Demand
- Maximum Demand
- Average Demand

REQ.13.3.4.2.11 The Program Administrator should specify any performance evaluation requirements for Highly-Variable Loads.

REQ.13.3.4.2.12 The Program Administrator should specify any performance evaluation requirements for on-site generation.

REQ.13.3.4.3 Baseline Evaluation

REQ.13.3.4.3.1 The Program Administrator should specify the Baseline Window.

REQ.13.3.4.3.2 The Program Administrator should specify the method of developing the Baseline value using, but not limited to, the following calculation types:

- Average kW over a specified interval
- Maximum kW over a specified interval
- Average
- Regression

REQ.13.3.4.3.3 Statistical sampling is generally permitted for this performance evaluation type/method, unless otherwise specified by the Program Administrator.



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- REQ.13.3.4.3.4** The Program Administrator should specify any rules for excluding data from the Baseline Window. Exclusion rules may be based on, but are not limited to the following:
- Historical Demand Response Events
 - Testing/Audit Periods
 - Calendar data
 - Outages
 - Weather emergencies or force majeure events
 - Usage threshold
 - Known, discrete load additions or reductions that have occurred during the Baseline Window
- REQ.13.3.4.3.5** The Program Administrator should specify any rules for Baseline Adjustments. Adjustment rules may be based on, but are not limited to the following:
- Temperature
 - Humidity
 - Calendar data
 - Sunrise/Sunset time
 - Event day operating conditions
- REQ.13.3.4.3.6** The Program Administrator should specify the Adjustment Window.
- REQ.13.3.4.3.7** The Program Administrator should specify if real-time Telemetry data is to be used to measure performance.
- REQ.13.3.4.3.8** After-The-Fact Metering is used to measure performance, unless otherwise specified by the Program Administrator.
- REQ.13.3.4.3.9** The Program Administrator should specify the Performance Window.
- REQ.13.3.4.3.10** During the Performance Window, the Demand Resource is evaluated using the same method of development of the Baseline value as identified in REQ.13.3.4.3.2-one of the following measurements unless otherwise specified by the Program Administrator:
- Maximum
 - Average
 - Regression



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REQ.13.3.4.3.11 The Program Administrator may specify performance evaluation requirements for Highly-Variable Loads.

REQ.13.3.4.3.12 The Program Administrator may specify performance evaluation requirements for on-site generation.

REQ.13.3.4.3.13 The Program Administrator should specify the testing protocol if an Operability Factor will be applied to the Demand Resource Availability Measurement.

REQ.13.3.4.4 Metering Generator Output Evaluation

REQ.13.3.4.4.1 The Program Administrator should specify Baseline calculations for Metering Generator Output.

REQ.13.3.4.4.2 The Program Administrator should specify if real-time Telemetry data is to be used to measure performance.

REQ.13.3.4.4.3 After-The-Fact Metering on the generator and optionally on the associated Load is used to measure performance unless otherwise specified by the Program Administrator.

REQ.13.3.4.4.4 The Program Administrator should specify the Performance Window.

REQ.13.3.4.4.5 During the Performance Window, the Demand Resource is evaluated using the total measured generation output unless otherwise specified by the Program Administrator.

REQ.13.3.4.4.6 The Program Administrator should specify any special processing rules.

4. SUPPORTING DOCUMENTATION

a. Description of Request:



**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

Requesters: DSM-EE Subcommittee
Request No.: 2010 Retail Annual Plan Item No. 3.c
Request Title: Phase 2: M&V for Demand Response Programs

b. Description of Recommendation:

The DSM-EE Subcommittee submits this Recommendation for 2010 Retail Annual Plan Item No. 3.c to support phase 2, retail development of Model Business Practices for Measurement & Verification (M&V) for Demand Response programs.

c. Business Purpose:

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):



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For Quadrant: Retail Electric Quadrant (REQ)**

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Request No.: 2010 Retail Annual Plan Item No. 3.c
Request Title: Phase 2: M&V for Demand Response Programs

1. RECOMMENDED ACTION:

☒ Accept as requested
☐ Accept as modified below
☐ Decline

**EFFECT OF EC VOTE TO ACCEPT
RECOMMENDED ACTION:**

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE

Per Request:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☐ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☐ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION

SUMMARY:

The DSM-EE Subcommittee submits this Recommendation for 2010 Retail Annual Plan Item No. 3.c to support phase 2, retail development of Model Business Practices for Measurement & Verification (M&V) for Demand Response programs.



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For Quadrant: Retail Electric Quadrant (REQ)**

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RECOMMENDED STANDARDS:

MEASUREMENT & VERIFICATION (M&V) OF DEMAND RESPONSE PROGRAMS

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Executive Summary

This section provides a common framework of the Model Business Practices for Measurement and Verification (M&V) of Demand Response programs in retail electric markets. The purpose of these Model Business Practices is to provide:

- **Transparency:** accessible and understandable M&V protocols for Demand Response programs
- **Accountability:** criteria that will enable the Program Administrator to accurately estimate load impacts of Demand Response Resources; and
- **Consistency:** a process or protocol that will allow Program Administrators, Applicable Regulatory Authorities, or program participants to agree on the required steps to take to verify demand reductions resulting from Demand Response programs in retail energy markets.
- **Comprehensive:** strives to cover all forms of Demand Response

The purpose of this Standard is to ensure that regulatory commissions and participants in retail electric markets in which dispatchable Demand Response products are administered have access to uniform Measurement and Verification protocols that will enable them to develop consistent values for the load impact estimates of the programs.

These Model Business Practices were designed in concert with Wholesale Electric Quadrant Standards covering Demand Response programs operating in wholesale electric markets. In the event of a conflict between these business practices and business practices developed by the Wholesale Electric Quadrant for products that are bid into wholesale markets, the Wholesale Electric Quadrant Standard should have precedence. Additionally, all Entities supplying Demand Response Services should comply with applicable North American Electric Reliability Corporation(NERC) reliability standards.



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Request Title:	Phase 2: M&V for Demand Response Programs

Introduction

The North American Energy Standards Board (NAESB) is a voluntary non-profit organization comprised of members from all aspects of the natural gas and electric industries. Within NAESB, the Retail Electric Quadrant (REQ) and the Retail Gas Quadrant (RGQ) focus on issues impacting the retail sale of energy to end-use customers. REQ / RGQ Model Business Practices are intended to provide guidance to Distribution Companies, Suppliers, and other Market Participants involved in providing energy service to end-use Customers. The focus of these Model Business Practices is performing M&V for Demand Response programs and is not intended to address Demand Response program design. These Model Business Practices are intended to be consistent with the Wholesale Electric Standards, but also acknowledge differences in product and program types between the two markets.

These Model Business Practices are voluntary and do not address policy issues that are the subject of state legislation or regulatory decisions. These Model Business Practices have been adopted with the realization that as the industry evolves, additional and amended Model Business Practices may be necessary. Any industry participant seeking additional or amended Model Business Practices (including principles, definitions, data elements, process descriptions, and technical implementation instructions) should submit a request to the NAESB office, detailing the change, so that the appropriate process may take place to amend the Model Business Practice.



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Business Processes and Practices

MEASUREMENT & VERIFICATION (M&V) OF DEMAND RESPONSE PROGRAMS

REQ.13 Overview

These M&V Model Business Practices establish criteria for the use of equipment, technology, and procedures to quantify the Demand Reduction Value delivered from retail demand response programs (product types). Model Business Practices developed may include commonalities among product types. The following outline of Model Business Practices is applicable to the Demand Response products.

General	Advance Notification
	Deployment Time
	Reduction Deadline
	Release/Recall
	Normal Operations
	Demand Resource Availability Measurement
	Aggregation
	Transparency of Requirements
Telemetry	Telemetry Requirement
	Telemetry Accuracy
	Telemetry Interval
	Other Telemetry Measurements
	Communication Protocol
	Governor Control Equivalent
	On-Site Generation Telemetry Requirement
After-The-Fact Metering	After-the-Fact Metering Requirement
	Meter Accuracy
	Details of Meter/Equipment Standards
	Meter Data Reporting Deadline
	Meter Data Reporting Interval
	Clock / Time Accuracy
	Validating, Editing & Estimating (VEE) Method
	On-Site Generation Meter Requirement
Performance Evaluation	Rules for Performance Evaluation



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For Demand Response products, a performance evaluation methodology is used to determine the Demand Reduction Value provided by a Demand Resource. The Model Business Practices include descriptions of acceptable Baselines and alternative performance measurements that are appropriate for each type of Demand Response products. The table below provides an outline of the applicable criteria for performance evaluation methodologies.

Baseline Information	Baseline Window
	Calculation Type
	Sampling Precision and Accuracy
	Exclusion Rules
	Baseline Adjustments
	Adjustment Window
Event Information	Use of Real-Time Telemetry
	Use of After-The-Fact Metering
	Performance Window
	Measurement Type
Special Processing	Highly-Variable Load Logic
	On-Site Generation Requirements

These Model Business Practices do not specify detailed characteristics of performance evaluation methodologies, but rather provide a framework that may be used to develop performance evaluation methodologies for specific Demand Response services. This approach is believed to be most appropriate at this time as development of performance evaluation methodologies and baseline calculations continues to mature. The following methodology types are applicable to retail Demand Response products:

- Maximum Base Load
- Meter Before / Meter After
- Baseline
- Metering Generator Output



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REQ.13.1 Principles

- REQ.13.1.1** The processes for M&V of Demand Response programs should be efficient to minimize the time and effort needed to accomplish these operational details.
- REQ.13.1.2** The processes for M&V of Demand Response programs should be consistent with the requirements set forth by the Applicable Regulatory Authority.
- REQ.13.1.3** The processes for M&V of Demand Response programs should minimize the occurrence of unauthorized activity in the marketplace.
- REQ.13.1.4** A contract or agreement between participants may establish different processes, timeframes, or operational requirements. Any conflict between these recommended processes and an applicable contract is resolved according to the provisions of the contract.
- REQ.13.1.5** These processes do not address contractual obligations between participants and their Customers, but because they are intended to be business practices, entities may incorporate them into contractual arrangements.
- REQ.13.1.6** All Customer specific data must remain confidential unless the parties otherwise agree.



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REQ.13.2 Definitions

REQ.13.2.A Business Definitions

REQ.0.2.145 Adjustment Window: The period of time prior to a Demand Response Event used for calculating a Baseline Adjustment.

REQ.0.2.146 Advance Notification(s): One or more communications to Demand Resources of an impending Demand Response Event in advance of the actual event.

REQ.0.2.147 After-the-Fact Metering: Interval meter data separate from Telemetry that is used to measure Demand Response. May not apply to Demand Resources under Baseline using statistical sampling.

RXQ.0.2.1 Applicable Regulatory Authority: The state regulatory agency or other local governing body that provides oversight, policy guidance, and direction to any parties involved in the process of providing energy to Retail Customers through regulation and orders.



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REQ.0.2.148 Baseline: A method of estimating the electricity that would have been consumed by a Customer or Demand Resource in the absence of a Demand Response Event. It may be calculated using interval metering and/or statistical sampling techniques. The figure below illustrates the concept of Baseline relative to a Demand Response Event.

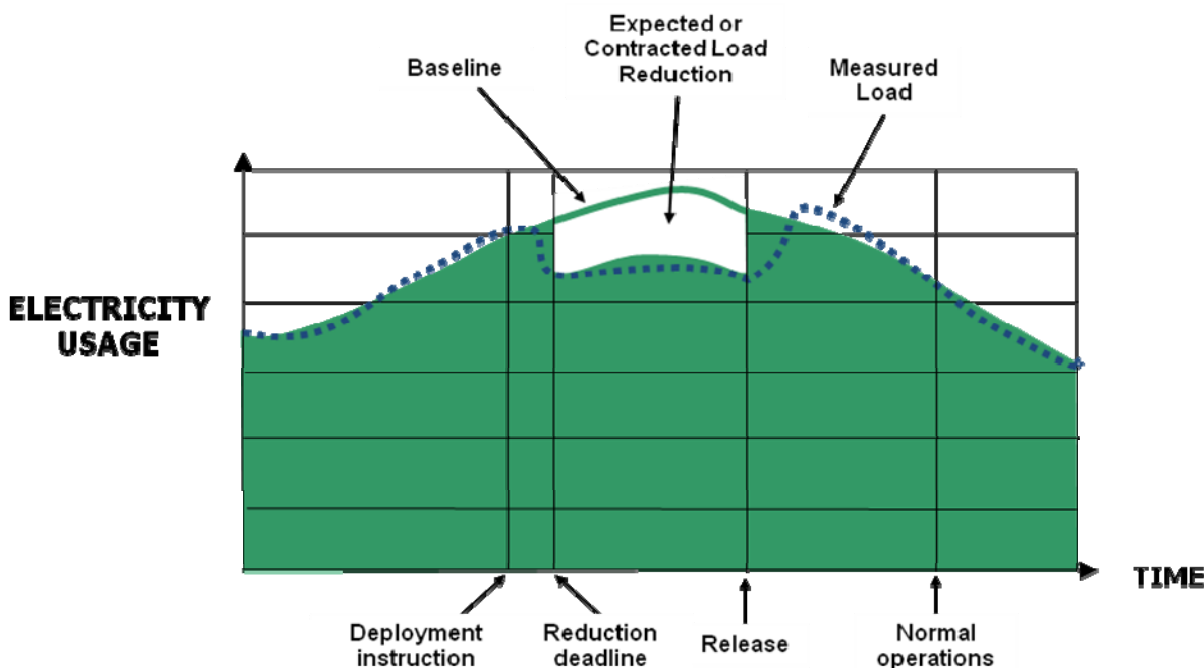


Figure 1. Illustration of Baseline Concept.

REQ.0.2.149 Baseline Adjustment: A modification to the Baseline to account for conditions immediately prior to or during a Demand Response Event to provide a better estimate of the energy the Demand Resource would have used but for the Demand Response Event. The adjustments may include but are not limited to weather conditions, near real time event facility Load, current Demand Resource operational information, or other parameters based on the Program Administrator's requirements.

REQ.0.2.150 Baseline Window: A period of time preceding and optionally following a Demand Response Event over which the electricity usage data is collected for the purpose of establishing a Baseline.

REQ.0.2.151 Capacity Service: A type of Demand Response service in which Demand Resources are obligated to control demand over a defined period of time measured in MW.

REQ.0.2.152 Critical Peak Pricing: A pricing structure in which the Customer receives notification identifying a time interval, ("critical hours") during which special higher prices apply over and above whatever other rate they may



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be charged. Critical hours generally represent a small percentage of the hours in the year.

RXQ.0.2.16 Customer: Any Entity that takes gas and/or electric service for its own usage.

REQ.0.2.153 Demand: The rate at which electric energy is delivered to or by a system or part of a system, generally expressed in kilowatts or megawatts, at a given instant or averaged over any designated interval of time; and the rate at which energy is being used by the Retail customer.

REQ.0.2.154 Demand Reduction Value: Measurement of reduced electricity usage by a Demand Resource during a Demand Response Event.

REQ.0.2.155 Demand Resource: A Load or aggregation of Loads capable of providing measurable and verifiable Demand Response.

REQ.0.2.156 Demand Resource Availability Measurement: The potential Demand Reduction Value available to be dispatched for a Demand Response Event.

REQ.0.2.157 Demand Response: A temporary change in electricity usage by a Demand Resource in response to market or reliability conditions. For purposes of these Model Business Practices, Demand Response does not include energy efficiency or permanent Load reduction.

For purposes of these Model Business Practices, this definition does not include energy efficiency or permanent Load reduction.



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REQ.0.2.158 Demand Response Event: A period of time defined by the Program Administrator, including notifications, deadlines, and transitions, during which Demand Resources provide Demand Response. All notifications, deadlines, and transitions may not be applicable to all Demand Response products or services.

The figure below represents the terms for timing events and time durations applicable to the characteristics of a dispatchable Demand Response Event. The definitions of the ten elements in the figure are the basis for describing the Timing of a Demand Response Event.

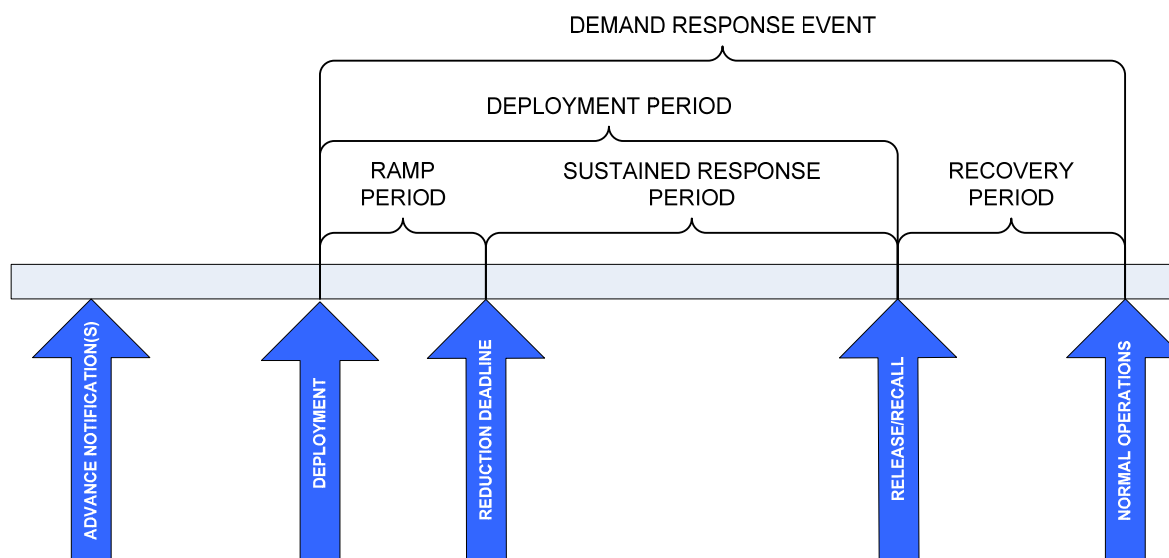


Figure 2. Timing of a Demand Response Event

REQ.0.2.159 Demand Response Provider: The Entity that is responsible for delivering Demand reductions from Demand Resources.

REQ.0.2.160 Deployment: The time at which a Demand Resource begins reducing Demand on the system in response to an instruction.

REQ.0.2.161 Deployment Period: The time in a Demand Response Event beginning with the Deployment and ending with the Release/Recall.

REQ.0.2.162 Direct Load Control: A Demand Response activity by which the program sponsor remotely shuts down or cycles a Customer's electrical equipment (e.g. air conditioner, water heater). Direct Load Control programs are primarily offered to residential or small commercial Customers.



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- REQ.0.2.163 Dispatchable Programs:** Programs that allow a Program Administrator to declare a Demand Response Event that has a specific start time and end time.
- RXQ.0.2.17 Distribution Company:** A regulated Entity which provides distribution services and may provide energy and/or transmission / transportation services in a given area.
- REQ.0.2.164 Energy Service:** A type of Demand Response service in which a Demand Resource provides a quantity of electricity measured in MWhs. .
- RXQ.0.2.47 Entity:** A person or organization with sufficient legal standing to enter into a contract or arrangement with another such person or organization (as such legal standing may be determined by those parties) for the purpose of conducting and/or coordinating energy transactions.
- REQ.0.2.165 Firm Service Level:** Demand level that a Customer must not exceed during a Demand Response Event.
- RXQ.0.2.22 Governing Documents:** Documents that determine the interactions among parties, including but not limited to: applicable law, regulatory documents (e.g., tariffs, rules, regulations), contractual agreements, Distribution Company Operational Manuals, and other relevant models and operational procedures.
- REQ.0.2.166 Guaranteed Load Drop:** Reduction of a specified amount of Load.
- REQ.0.2.167 Highly-Variable Load:** A Load with a fluctuating or unpredictable electricity usage pattern.
- REQ.0.2.168 Load:** An end-use device or customer that receives power from the electric system.



NAESB REQ Recommendation For Quadrant: Retail Electric Quadrant (REQ)

Requesters: DSM-EE Subcommittee
Request No.: 2010 Retail Annual Plan Item No. 3.c
Request Title: Phase 2: M&V for Demand Response Programs

REQ.0.2.169 Maximum Base Load: A performance evaluation methodology based solely on a Demand Resource's ability to maintain its electricity usage at or below a specified level during a Demand Response Event.

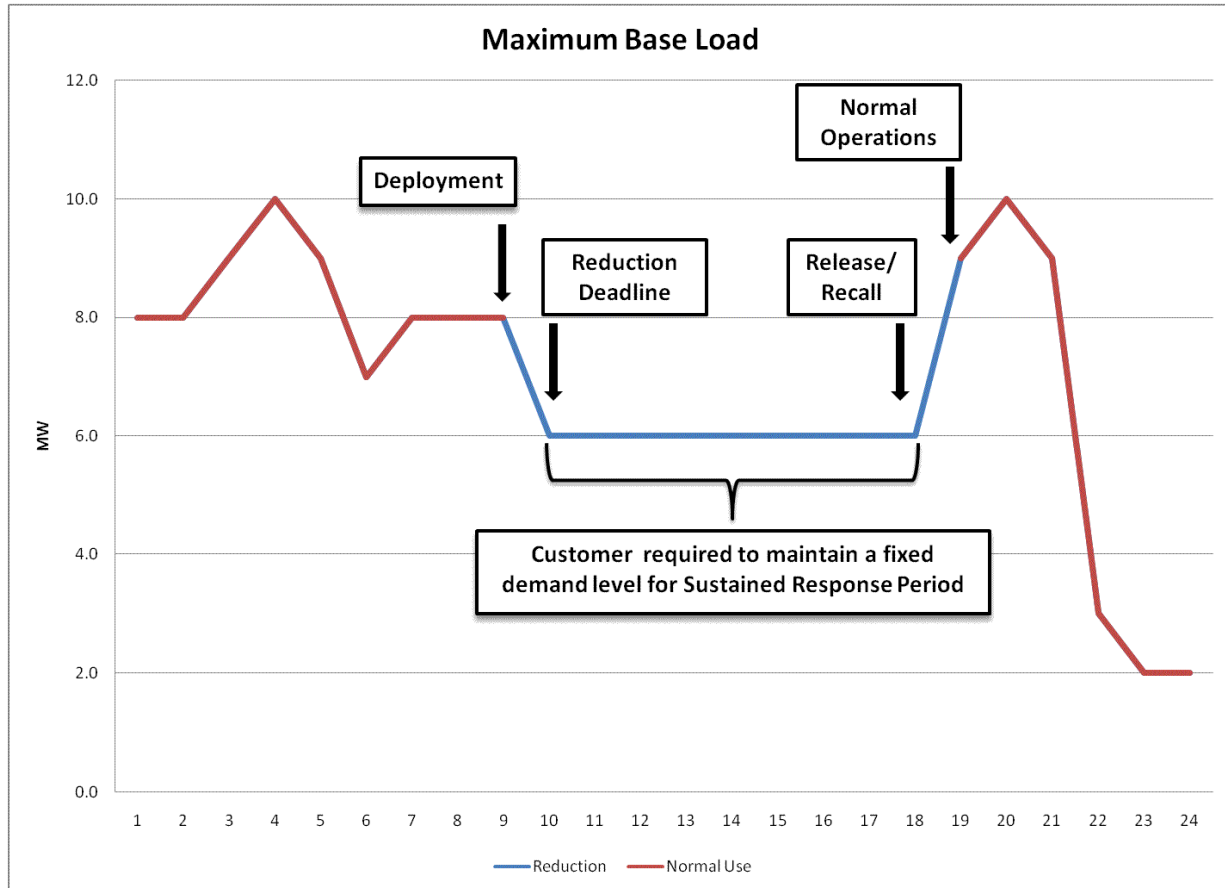


Figure 3. Maximum Base Load Illustration



NAESB REQ Recommendation For Quadrant: Retail Electric Quadrant (REQ)

Requesters: DSM-EE Subcommittee
Request No.: 2010 Retail Annual Plan Item No. 3.c
Request Title: Phase 2: M&V for Demand Response Programs

REQ.0.2.170 Meter Before / Meter After: A performance evaluation methodology where electricity Demand over a prescribed period of time prior to Deployment is compared to similar readings during the Sustained Response Period.

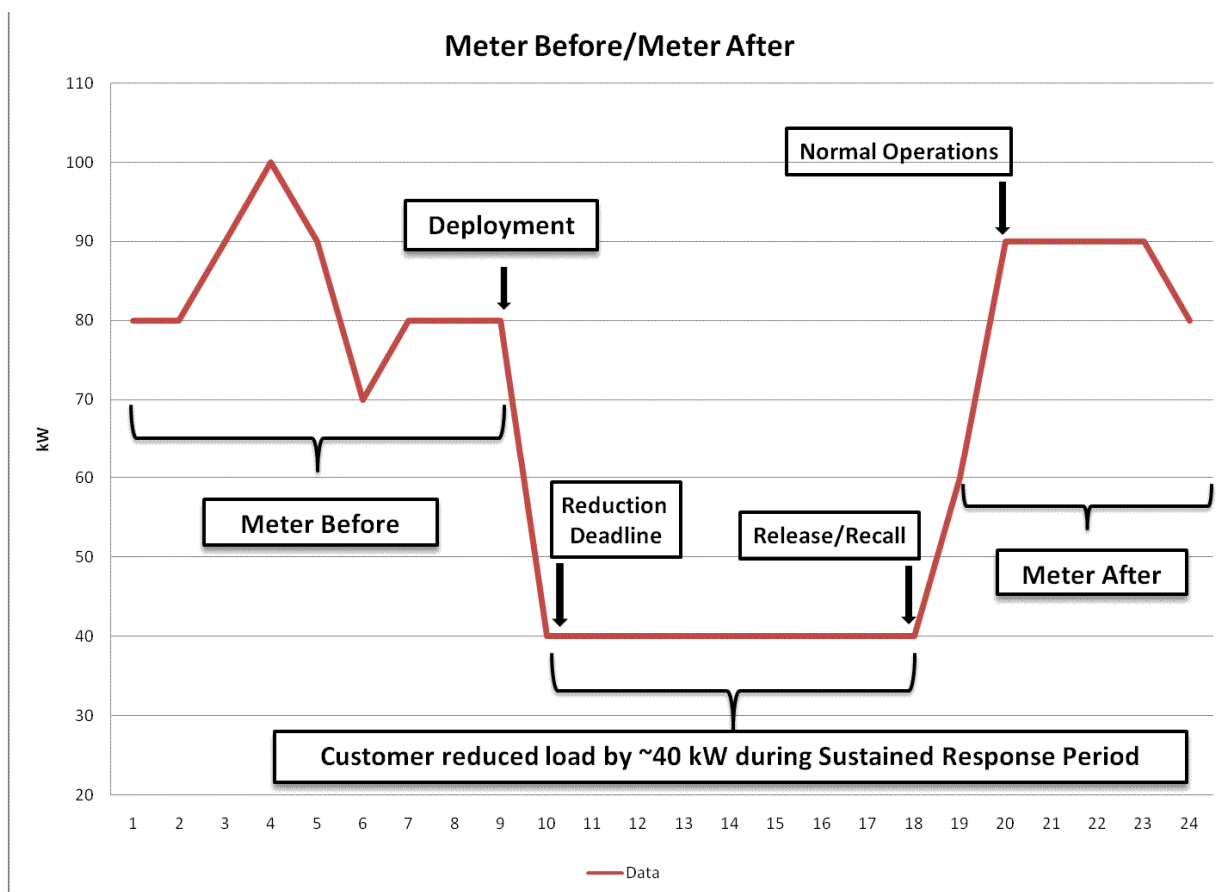


Figure 4. Meter Before/Meter After Illustration

REQ.0.2.171 Meter Data Recording Interval: The time between electricity meter usage recordings.

REQ.0.2.172 Meter Data Reporting Deadline: The maximum allowed time from the end of a Demand Response Event (Normal Operations) to the time when meter data is required to be submitted for performance evaluation and settlement. The Meter Data Reporting Deadline may be either relative (a number of hours/days after Normal Operations) or fixed (a fixed calendar time, such as end-of-month).

REQ.0.2.173 Metering Generator Output: A performance evaluation methodology in which the Demand Reduction Value is based on the output of a generator located behind the Demand Resource's revenue meter.



**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

Requesters: DSM-EE Subcommittee
Request No.: 2010 Retail Annual Plan Item No. 3.c
Request Title: Phase 2: M&V for Demand Response Programs

- REQ.0.2.174 Non-Dispatchable Programs:** Programs in which Demand Resources curtail according to tariff structure, not in response to instructions from a Program Administrator.
- REQ.0.2.175 Non-Spinning Reserve:** Operating reserves that can be started, synchronized and loaded within a specified time period.
- REQ.0.2.176 Normal Operations:** The time following Release/Recall at which a Program Administrator may require a Demand Resource to have returned its Load usage to normal levels, and to be available again for Deployment.
- REQ.0.2.177 Operability Factor:** A net-to-gross percentage applied to the Demand Resource Availability Measurement, developed using a defined and documented testing protocol to verify both signal reception and device operation of the units in a retail Demand Response program, specific to a time period.
- REQ.0.2.178 Performance Window:** The period of time in a Demand Response Event analyzed by the Program Administrator to measure and verify the Demand Reduction Value for a Demand Resource.
- REQ.0.2.179 Program Administrator:** An investor-owned, governmental or cooperative utility with the responsibility for developing and operating Demand Response programs.
- REQ.0.2.180 Ramp Period:** The time between Deployment and Reduction Deadline, representing the period of time over which a Demand Resource is expected to achieve its change in Demand.
- REQ.0.2.181 Ramp Rate:** The rate, expressed in megawatts per minute, that a generator changes its output or a Demand Resource changes its Load.
- REQ.0.2.182 Real Time Pricing:** A retail rate in which the price for electricity fluctuates reflecting changes in the wholesale price of electricity.
- REQ.0.2.183 Recovery Period:** The time between Release/Recall and Normal Operations, representing the window over which Demand Resources are required to return to their normal Load.
- REQ.0.2.184 Reduction Deadline:** The time at the end of the Ramp Period when a Demand Resource is required to have met its Demand Reduction Value obligation.
- REQ.0.2.185 Regulation Service:** A type of Demand Response service in which a Demand Resource increases and decreases Load in response to real-time signals from the Program Administrator. Demand Resources providing Regulation Service are subject to dispatch continuously during a commitment period. Provision of Regulation Service does not correlate to time periods, deadlines and transitions in the Demand Response Event definition.



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- REQ.0.2.186 Release/Recall:** The time when the Program Administrator specifies a Deployment Period has ended or will end.
- REQ.0.2.187 Spinning Reserve:** Operating reserves from resources that are synchronized to the grid and can respond to instructions from the Program Administrator.
- REQ.0.2.188 Sustained Response Period:** The period of time between Reduction Deadline and Release/Recall over which a Demand Resource is required to deliver its obligated Demand Reduction Value.
- REQ.0.2.189 Telemetry:** Equipment for measuring a quantity and transmitting the result to a remote location for measurement, monitoring, display or recording.
- REQ.0.2.190 Telemetry Interval:** The unit of time between communications of telemetered data.
- REQ.0.2.191 Time-of-Use Rates:** Rates where usage unit prices vary by more than one time period within a 24-hour day to reflect the average cost of generating and delivering power during those time periods. Daily pricing blocks may include, but are not limited to, an on-peak, partial-peak, and an off-peak price for non-holiday weekdays, with the on-peak price as the highest price, and the off-peak price as the lowest price.
- REQ.0.2.192 Validation, Editing and Estimation:** The process of confirming the accuracy of raw meter data and, if necessary, replacing corrupt or missing data. VEE guidelines are published in the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering.



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For Quadrant: Retail Electric Quadrant (REQ)**

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REQ.13.3 Model Business Practices

REQ.13.3.1 General Characteristics of a Demand Response Event

- REQ.13.3.1.1** All actions taken in a Demand Response Event should be in accordance with the Governing Documents.
- REQ.13.3.1.2** Advance Notification: The Program Administrator should specify any requirements for the Advance Notification.
- REQ.13.3.1.3** The Program Administrator should initiate Deployment of the Demand Resource(s) depending on the specific circumstance(s) of the Demand Response Event.
- REQ.13.3.1.4** The Reduction Deadline will depend on the specific circumstance(s) of the Demand Response Event and should be specified by the Program Administrator.
- REQ.13.3.1.5** Any requirement(s) for a Ramp Period or a specified Ramp Rate will depend on the specific circumstance(s) of the Demand Response Event and should be specified by the Program Administrator.
- REQ.13.3.1.6** The Release / Recall will depend on the specific circumstance(s) of the Demand Response Event and should be specified by the Program Administrator.
- REQ.13.3.1.7** Any requirement for a return to Normal Operations will depend on the specific circumstance(s) of the Demand Response Event and the Recovery Period should be specified by the Program Administrator.

REQ.13.3.2 Measurement of Load

- REQ.13.3.2.1** Demand Response resource value may be estimated via Telemetry or After-the-Fact Metering or both.
- REQ.13.3.2.2** After-the-fact measurement is required either by metering each individual site or by statistical sampling.
- REQ.13.3.2.3** Meter accuracy should meet or exceed industry standards or as specified by the Applicable Regulatory Authority.
- REQ.13.3.2.4** Meters and other equipment should meet or exceed industry standards equivalent to ANSI C12 or as specified by the Applicable Regulatory Authority.
- REQ.13.3.2.5** The Meter Data Reporting Deadline should be specified in the Governing Documents.



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REQ.13.3.2.6 The Meter Data Recording Interval should be specified in the Governing Documents.

REQ.13.3.2.7 The meter clock / time accuracy should meet or exceed industry standards equivalent to ANSI C12 or as specified by the Applicable Regulatory Authority.

REQ.13.3.2.8 The method of Validating, Editing and Estimation should conform to an accepted methodology (such as the guidelines published in the current edition of the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering), and should be specified in the Governing Documents.

REQ.13.3.3 Statistical Sampling

REQ.13.3.3.1 The method of statistical sampling used should conform to an accepted methodology and should be specified in the Governing Documents. The following list provides examples of currently accepted methodologies:

- The Association of Edison Illuminating Companies (AEIC) Load Research Manual
 - Chapter 4 – Sample Design and Selection
 - Chapter 5 – Sample Implementation¹
- The Federal Energy Management Program M&V Guidelines: Measurement and Verification for Federal Energy Projects – Appendix B²;
- The California Energy Efficiency Evaluation Protocols³;
- The California Evaluation Framework – Chapter 13⁴; or
- The Independent System Operator (ISO)-New England Manual for Measurement and Verification of Demand Reduction Value from Demand Resources, Section 7⁵.

REQ.13.3.3.2 The general steps to be taken in statistical sampling are, but are not limited to:

- Define the population
- Design the sample to meet program objectives.

¹ Association of Edison Illuminating Companies (AEIC), *Load Research Manual*, 2nd ed., Birmingham, AL, 2001, www.aeic.org

² US Department of Energy. M&V Guidelines: Measurement and Verification for Federal Energy Management Projects Version 3.0. 2008. (or current version).

³ California Public Utilities Commission, *California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals*, 2006. (<http://www.cpuc.ca.gov/PUC/>)

⁴ California Public Utilities Commission, *The California Evaluation Framework*, current version. (<http://www.cpuc.ca.gov/PUC/>).

⁵ ISO-New England, *Manual for Measurement and Verification of Demand Resources*, (M-MVDR), current version. (http://www.iso-ne.com/rules_proceeds/isone_mnls/index.html).



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- Specify the listing of units available to be sampled which is sometimes called the sampling frame
- Identify design (auxiliary) variables
- Choose the sampling technique
 - o Choose stratification variable(s)
 - o Select allocation procedure
 - o Estimate means and variances of loads
 - o Examine sample size requirements
 - o Select sampling techniques and design
- Determine the sample size
- Identify those units to be in the sample
 - o Identify the criteria for selecting those units to be substituted for sample units who decline
 - o Select sample and alternates
 - o Validate sample
- Contacting and enroll the Customers to be in the sample, and install the metering devices, if needed
- Collect interval meter data.

REQ.13.3.3.3 The sample drawn should comport to a level of statistical significance that supports the goals of the program

REQ.13.3.4 Performance Evaluation Methods

Performance is evaluated through the use of one of the following methods unless otherwise specified by the Program Administrator:

- Maximum Base Load
- Meter Before / Meter After
- Baseline
- Metering Generator Output

REQ.13.3.4.1 Maximum Base Load Evaluation

REQ.13.3.4.1.1 Any requirement for real-time Telemetry data to be used to measure performance should be specified by the Program Administrator.

REQ.13.3.4.1.2 Any requirement for After-The-Fact Metering should be specified by the Program Administrator.



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REQ.13.3.4.1.3 The Performance Window is the Sustained Response Period (Reduction Deadline through Release/Recall) unless otherwise specified by the Program Administrator.

REQ.13.3.4.1.4 During the Performance Window, the Demand Resource must maintain its electricity consumption at or below the Maximum Base Load. The criteria used to evaluate performance is one of the following unless otherwise specified by the Program Administrator:

- Average Demand
- Peak Demand

REQ.13.3.4.2 Meter Before / Meter After Evaluation

REQ.13.3.4.2.1 The Program Administrator should specify the Baseline Window.

REQ.13.3.4.2.2 During the Baseline Window, the Demand Reduction Value of the Demand Resource is evaluated using one of the following measurements as specified by the Program Administrator:

- Average Demand
- Instantaneous Demand
- Maximum Demand

REQ.13.3.4.2.3 Statistical sampling is not used for this performance evaluation method, unless otherwise specified by the Program Administrator.

REQ.13.3.4.2.4 The Program Administrator should specify any time periods to be excluded from Baseline Window.

REQ.13.3.4.2.5 The Program Administrator should specify any Baseline Adjustments.

REQ.13.3.4.2.6 No Adjustment Window is used for this model unless otherwise specified by the Program Administrator.

REQ.13.3.4.2.7 The Program Administrator should specify if real-time Telemetry data is to be used to measure performance.

REQ.13.3.4.2.8 After-The-Fact Metering should be used to measure performance, unless otherwise specified by the Program Administrator.

REQ.13.3.4.2.9 The Performance Window is the Sustained Response Period (Reduction Deadline through Release/Recall) unless otherwise specified by the Program Administrator.



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- **REQ.13.3.4.2.10** During the Performance Window, the Demand Resource is evaluated using the same method of development of the Demand Reduction Value as identified in REQ.13.3.4.2.2.

REQ.13.3.4.2.11 The Program Administrator should specify any performance evaluation requirements for Highly-Variable Loads.

REQ.13.3.4.2.12 The Program Administrator should specify any performance evaluation requirements for on-site generation.

REQ.13.3.4.3 Baseline Evaluation

REQ.13.3.4.3.1 The Program Administrator should specify the Baseline Window.

REQ.13.3.4.3.2 The Program Administrator should specify the method of developing the Baseline value using, but not limited to, the following calculation types:

- Average kW over a specified interval
- Maximum kW over a specified interval
- Regression

REQ.13.3.4.3.3 Statistical sampling is generally permitted for this performance evaluation method, unless otherwise specified by the Program Administrator.

REQ.13.3.4.3.4 The Program Administrator should specify any rules for excluding data from the Baseline Window. Exclusion rules may be based on, but are not limited to the following:

- Historical Demand Response Events
- Testing/Audit Periods
- Calendar data
- Outages
- Weather emergencies or force majeure events
- Usage threshold
- Known, discrete load additions or reductions that have occurred during the Baseline Window

REQ.13.3.4.3.5 The Program Administrator should specify any rules for Baseline Adjustments. Adjustment rules may be based on, but are not limited to the following:

- Temperature



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- Humidity
- Calendar data
- Sunrise/Sunset time
- Event day operating conditions

REQ.13.3.4.3.6 The Program Administrator should specify the Adjustment Window.

REQ.13.3.4.3.7 The Program Administrator should specify if real-time Telemetry data is to be used to measure performance.

REQ.13.3.4.3.8 After-The-Fact Metering is used to measure performance, unless otherwise specified by the Program Administrator.

REQ.13.3.4.3.9 The Program Administrator should specify the Performance Window.

- **REQ.13.3.4.3.10** During the Performance Window, the Demand Resource is evaluated using the same method of development of the Baseline value as identified in REQ.13.3.4.3.2

REQ.13.3.4.3.11 The Program Administrator may specify performance evaluation requirements for Highly-Variable Loads.

REQ.13.3.4.3.12 The Program Administrator may specify performance evaluation requirements for on-site generation.

REQ.13.3.4.3.13 The Program Administrator should specify the testing protocol if an Operability Factor will be applied to the Demand Resource Availability Measurement.

REQ.13.3.4.4 Metering Generator Output Evaluation

REQ.13.3.4.4.1 The Program Administrator should specify Baseline calculations for Metering Generator Output.

REQ.13.3.4.4.2 The Program Administrator should specify if real-time Telemetry data is to be used to measure performance.

REQ.13.3.4.4.3 After-The-Fact Metering on the generator and optionally on the associated Load is used to measure performance unless otherwise specified by the Program Administrator.

REQ.13.3.4.4.4 The Program Administrator should specify the Performance Window.



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REQ.13.3.4.4.5 During the Performance Window, the Demand Resource is evaluated using the total measured generation output unless otherwise specified by the Program Administrator.

REQ.13.3.4.4.6 The Program Administrator should specify any special processing rules.



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For Quadrant: Retail Electric Quadrant (REQ)**

Requesters:	DSM-EE Subcommittee
Request No.:	2010 Retail Annual Plan Item No. 3.c
Request Title:	Phase 2: M&V for Demand Response Programs

4. SUPPORTING DOCUMENTATION

a. Description of Request:

b. Description of Recommendation:

The DSM-EE Subcommittee submits this Recommendation for 2010 Retail Annual Plan Item No. 3.c to support phase 2, retail development of Model Business Practices for Measurement & Verification (M&V) for Demand Response programs.

c. Business Purpose:

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):



**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

Requesters: DSM-EE Subcommittee
Request No.: 2010 Retail Annual Plan Item No. 3.c
Request Title: Phase 2: M&V for Demand Response Programs

1. RECOMMENDED ACTION:

☒ Accept as requested
☐ Accept as modified below
☐ Decline

**EFFECT OF EC VOTE TO ACCEPT
RECOMMENDED ACTION:**

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE**Per Request:**

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☐ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☐ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION**SUMMARY:**

The DSM-EE Subcommittee submits this Recommendation for 2010 Retail Annual Plan Item No. 3.c to support phase 2, retail development of Model Business Practices for Measurement & Verification (M&V) for Demand Response programs.



**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

Requesters: DSM-EE Subcommittee
Request No.: 2010 Retail Annual Plan Item No. 3.c
Request Title: Phase 2: M&V for Demand Response Programs

RECOMMENDED STANDARDS:

MEASUREMENT & VERIFICATION (M&V) OF DEMAND RESPONSE PROGRAMS

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**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

Requesters: DSM-EE Subcommittee
Request No.: 2010 Retail Annual Plan Item No. 3.c
Request Title: Phase 2: M&V for Demand Response Programs

Executive Summary

This section provides a common framework of the Model Business Practices for Measurement and Verification (M&V) of Demand Response programs in retail electric markets. The purpose of these Model Business Practices is to provide:

- **Transparency:** accessible and understandable M&V protocols for Demand Response programs
- **Accountability:** criteria that will enable the Program Administrator to accurately estimate load impacts of Demand Response Resources; and
- **Consistency:** a process or protocol that will allow Program Administrators, Applicable Regulatory Authorities, or program participants to agree on the required steps to take to verify demand reductions resulting from Demand Response programs in retail energy markets.
- **Comprehensive:** strives to cover all forms of Demand Response

The purpose of this Standard is to ensure that regulatory commissions and participants in retail electric markets in which dispatchable Demand Response products are administered have access to uniform Measurement and Verification protocols that will enable them to develop consistent values for the load impact estimates of the programs.

These Model Business Practices were designed in concert with Wholesale Electric Quadrant Standards covering Demand Response programs operating in wholesale electric markets. In the event of a conflict between these business practices and business practices developed by the Wholesale Electric Quadrant for products that are bid into wholesale markets, the Wholesale Electric Quadrant Standard should have precedence. Additionally, all Entities supplying Demand Response Services should comply with applicable North American Electric Reliability Corporation(NERC) reliability standards.

**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

Requesters:	DSM-EE Subcommittee
Request No.:	2010 Retail Annual Plan Item No. 3.c
Request Title:	Phase 2: M&V for Demand Response Programs

Introduction

The North American Energy Standards Board (NAESB) is a voluntary non-profit organization comprised of members from all aspects of the natural gas and electric industries. Within NAESB, the Retail Electric Quadrant (REQ) and the Retail Gas Quadrant (RGQ) focus on issues impacting the retail sale of energy to end-use customers. REQ / RGQ Model Business Practices are intended to provide guidance to Distribution Companies, Suppliers, and other Market Participants involved in providing energy service to end-use Customers. The focus of these Model Business Practices is performing M&V for Demand Response programs and is not intended to address Demand Response program design. These Model Business Practices are intended to be consistent with the Wholesale Electric Standards, but also acknowledge differences in product and program types between the two markets.

These Model Business Practices are voluntary and do not address policy issues that are the subject of state legislation or regulatory decisions. These Model Business Practices have been adopted with the realization that as the industry evolves, additional and amended Model Business Practices may be necessary. Any industry participant seeking additional or amended Model Business Practices (including principles, definitions, data elements, process descriptions, and technical implementation instructions) should submit a request to the NAESB office, detailing the change, so that the appropriate process may take place to amend the Model Business Practice.



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Business Processes and Practices

MEASUREMENT & VERIFICATION (M&V) OF DEMAND RESPONSE PROGRAMS

REQ.13 Overview

These M&V Model Business Practices establish criteria for the use of equipment, technology, and procedures to quantify the Demand Reduction Value delivered from retail demand response programs (product types). Model Business Practices developed may include commonalities among product types. The following outline of Model Business Practices is applicable to the Demand Response products.

General	Advance Notification
	Deployment Time
	Reduction Deadline
	Release/Recall
	Normal Operations
	Demand Resource Availability Measurement
	Aggregation
	Transparency of Requirements
Telemetry	Telemetry Requirement
	Telemetry Accuracy
	Telemetry Interval
	Other Telemetry Measurements
	Communication Protocol
	Governor Control Equivalent
	On-Site Generation Telemetry Requirement
After-The-Fact Metering	After-the-Fact Metering Requirement
	Meter Accuracy
	Details of Meter/Equipment Standards
	Meter Data Reporting Deadline
	Meter Data Reporting Interval
	Clock / Time Accuracy
	Validating, Editing & Estimating (VEE) Method
	On-Site Generation Meter Requirement
Performance Evaluation	Rules for Performance Evaluation



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Request Title: Phase 2: M&V for Demand Response Programs

For Demand Response products, a performance evaluation methodology is used to determine the Demand Reduction Value provided by a Demand Resource. The Model Business Practices include descriptions of acceptable Baselines and alternative performance measurements that are appropriate for each type of Demand Response products. The table below provides an outline of the applicable criteria for performance evaluation methodologies.

Baseline Information	Baseline Window
	Calculation Type
	Sampling Precision and Accuracy
	Exclusion Rules
	Baseline Adjustments
	Adjustment Window
Event Information	Use of Real-Time Telemetry
	Use of After-The-Fact Metering
	Performance Window
	Measurement Type
Special Processing	Highly-Variable Load Logic
	On-Site Generation Requirements

These Model Business Practices do not specify detailed characteristics of performance evaluation methodologies, but rather provide a framework that may be used to develop performance evaluation methodologies for specific Demand Response services. This approach is believed to be most appropriate at this time as development of performance evaluation methodologies and baseline calculations continues to mature. The following methodology types are applicable to retail Demand Response products:

- Maximum Base Load
- Meter Before / Meter After
- Baseline
- Metering Generator Output



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Request No.: 2010 Retail Annual Plan Item No. 3.c
Request Title: Phase 2: M&V for Demand Response Programs

REQ.13.1 Principles

- REQ.13.1.1** The processes for M&V of Demand Response programs should be efficient to minimize the time and effort needed to accomplish these operational details.
- REQ.13.1.2** The processes for M&V of Demand Response programs should be consistent with the requirements set forth by the Applicable Regulatory Authority.
- REQ.13.1.3** The processes for M&V of Demand Response programs should minimize^[T1] the occurrence of unauthorized activity in the marketplace.
- REQ.13.1.4** A contract or agreement between participants may establish different processes, timeframes, or operational requirements. Any conflict between these recommended processes and an applicable contract is resolved according to the provisions of the contract.
- REQ.13.1.5** These processes do not address contractual obligations between participants and their Customers, but because they are intended to be business practices, entities may incorporate them into contractual arrangements.
- REQ.13.1.6** All Customer specific data must remain confidential unless the parties otherwise agree.



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REQ.13.2 Definitions

REQ.13.2.A Business Definitions

REQ.0.2.145 Adjustment Window: The period of time prior to a Demand Response Event used for calculating a Baseline Adjustment.

REQ.0.2.146 Advance Notification(s): One or more communications to Demand Resources of an impending Demand Response Event in advance of the actual event.

REQ.0.2.147 After-the-Fact Metering: Interval meter data separate from Telemetry that is used to measure Demand Response. May not apply to Demand Resources under Baseline using statistical sampling.

RXQ.0.2.1 Applicable Regulatory Authority: The state regulatory agency or other local governing body that provides oversight, policy guidance, and direction to any parties involved in the process of providing energy to Retail Customers through regulation and orders.



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REQ.0.2.148 Baseline: A method of estimating the electricity that would have been consumed by a Customer or Demand Resource in the absence of a Demand Response Event. It may be calculated using interval metering and/or statistical sampling techniques. The figure below illustrates the concept of Baseline relative to a Demand Response Event.

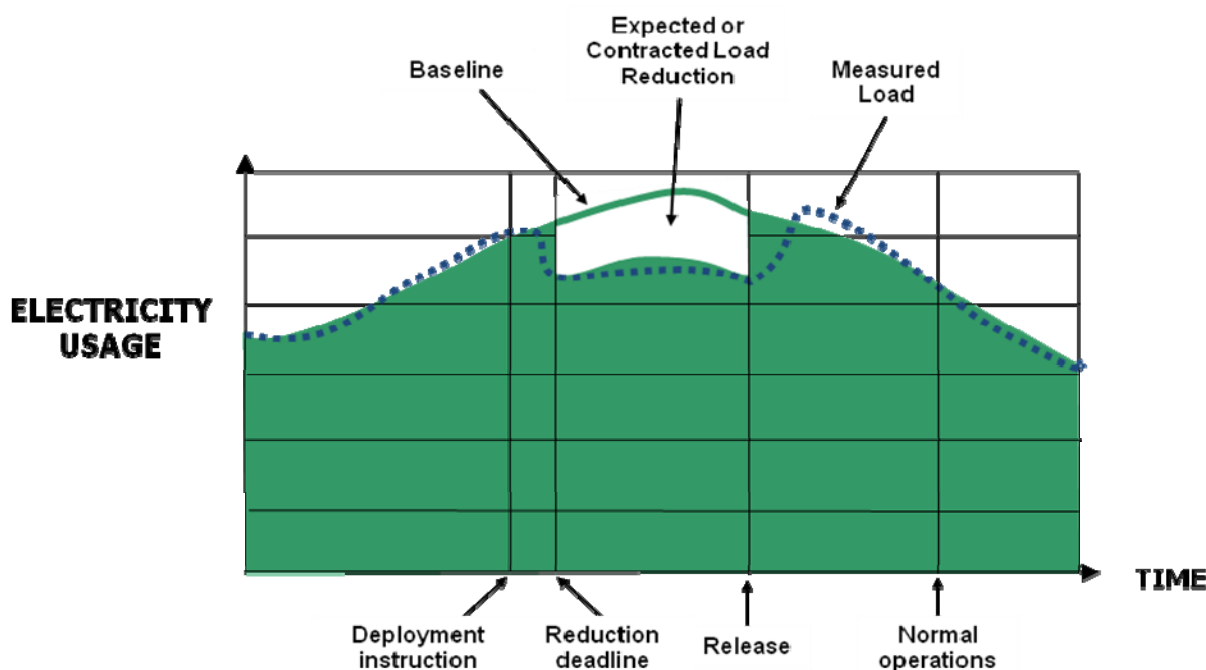


Figure 1. Illustration of Baseline Concept.

REQ.0.2.149 Baseline Adjustment: A modification to the Baseline to account for conditions immediately prior to or during a Demand Response Event to provide a better estimate of the energy the Demand Resource would have used but for the Demand Response Event. The adjustments may include but are not limited to weather conditions, near real time event facility Load, current Demand Resource operational information, or other parameters based on the Program Administrator's requirements.

REQ.0.2.150 Baseline Window: A period of time preceding and optionally following a Demand Response Event over which the electricity usage data is collected for the purpose of establishing a Baseline.

REQ.0.2.151 Capacity Service: A type of Demand Response service in which Demand Resources are obligated to control demand over a defined period of time measured in MW.

REQ.0.2.152 Critical Peak Pricing: A pricing structure in which the Customer receives notification identifying a time interval, ("critical hours") during which special higher prices apply over and above whatever other rate they may



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be charged. Critical hours generally represent a small percentage of the hours in the year.

RXQ.0.2.16 Customer: Any Entity that takes gas and/or electric service for its own usage.

REQ.0.2.153 Demand: The rate at which electric energy is delivered to or by a system or part of a system, generally expressed in kilowatts or megawatts, at a given instant or averaged over any designated interval of time; and the rate at which energy is being used by the Retail customer.

REQ.0.2.154 Demand Reduction Value: Measurement of reduced electricity usage by a Demand Resource during a Demand Response Event.

REQ.0.2.155 Demand Resource: A Load or aggregation of Loads capable of providing measurable and verifiable Demand Response.

REQ.0.2.156 Demand Resource Availability Measurement^{T2}: The potential Demand Reduction Value available to be dispatched for a Demand Response Event.

REQ.0.2.157 Demand Response: A temporary change in electricity usage by a Demand Resource in response to market or reliability conditions. For purposes of these Model Business Practices, Demand Response does not include energy efficiency or permanent Load reduction.

For purposes of these Model Business Practices, this definition does not include energy efficiency or permanent Load reduction.



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REQ.0.2.158 Demand Response Event: A period of time defined by the Program Administrator, including notifications, deadlines, and transitions, during which Demand Resources provide Demand Response. All notifications, deadlines, and transitions may not be applicable to all Demand Response products or services.

The figure below represents the terms for timing events and time durations applicable to the characteristics of a dispatchable Demand Response Event. The definitions of the ten elements in the figure are the basis for describing the Timing of a Demand Response Event.

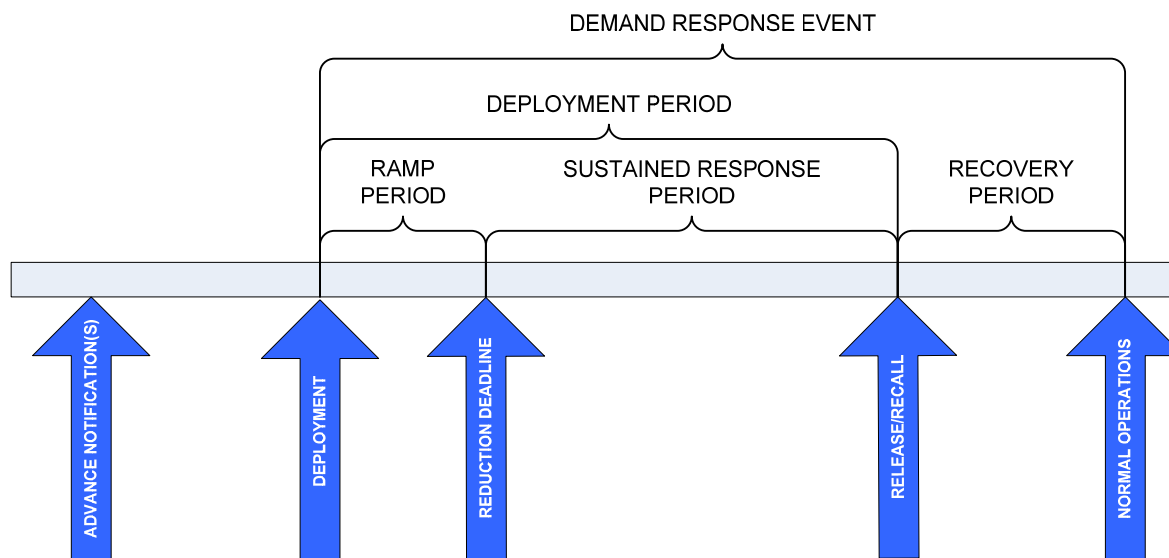


Figure 2. Timing of a Demand Response Event

REQ.0.2.159 Demand Response Provider: The Entity that is responsible for delivering Demand reductions from Demand Resources.

REQ.0.2.160 Deployment: The time at which a Demand Resource begins reducing Demand on the system in response to an instruction.

REQ.0.2.161 Deployment Period: The time in a Demand Response Event beginning with the Deployment and ending with the Release/Recall.

REQ.0.2.162 Direct Load Control: A Demand Response activity by which the program sponsor remotely shuts down or cycles a Customer's electrical equipment (e.g. air conditioner, water heater). Direct Load Control programs are primarily offered to residential or small commercial Customers.



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- REQ.0.2.163 Dispatchable Programs:** Programs that allow a Program Administrator to declare a Demand Response Event that has a specific start time and end time.
- RXQ.0.2.17 Distribution Company:** A regulated Entity which provides distribution services and may provide energy and/or transmission / transportation services in a given area.
- REQ.0.2.164 Energy Service:** A type of Demand Response service in which a Demand Resource provides a quantity of electricity measured in MWhs. .
- RXQ.0.2.47 Entity:** A person or organization with sufficient legal standing to enter into a contract or arrangement with another such person or organization (as such legal standing may be determined by those parties) for the purpose of conducting and/or coordinating energy transactions.
- REQ.0.2.165 Firm Service Level:** Demand level that a Customer must not exceed during a Demand Response Event.
- RXQ.0.2.22 Governing Documents:** Documents that determine the interactions among parties, including but not limited to: applicable law, regulatory documents (e.g., tariffs, rules, regulations), contractual agreements, Distribution Company Operational Manuals, and other relevant models and operational procedures.
- REQ.0.2.166 Guaranteed Load Drop:** Reduction of a specified amount of Load.
- REQ.0.2.167 Highly-Variable Load:** A Load with a fluctuating or unpredictable electricity usage pattern.
- REQ.0.2.168 Load:** An end-use device or customer that receives power from the electric system.



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REQ.0.2.169 Maximum Base Load: A performance evaluation methodology based solely on a Demand Resource's ability to maintain its electricity usage at or below a specified level during a Demand Response Event.

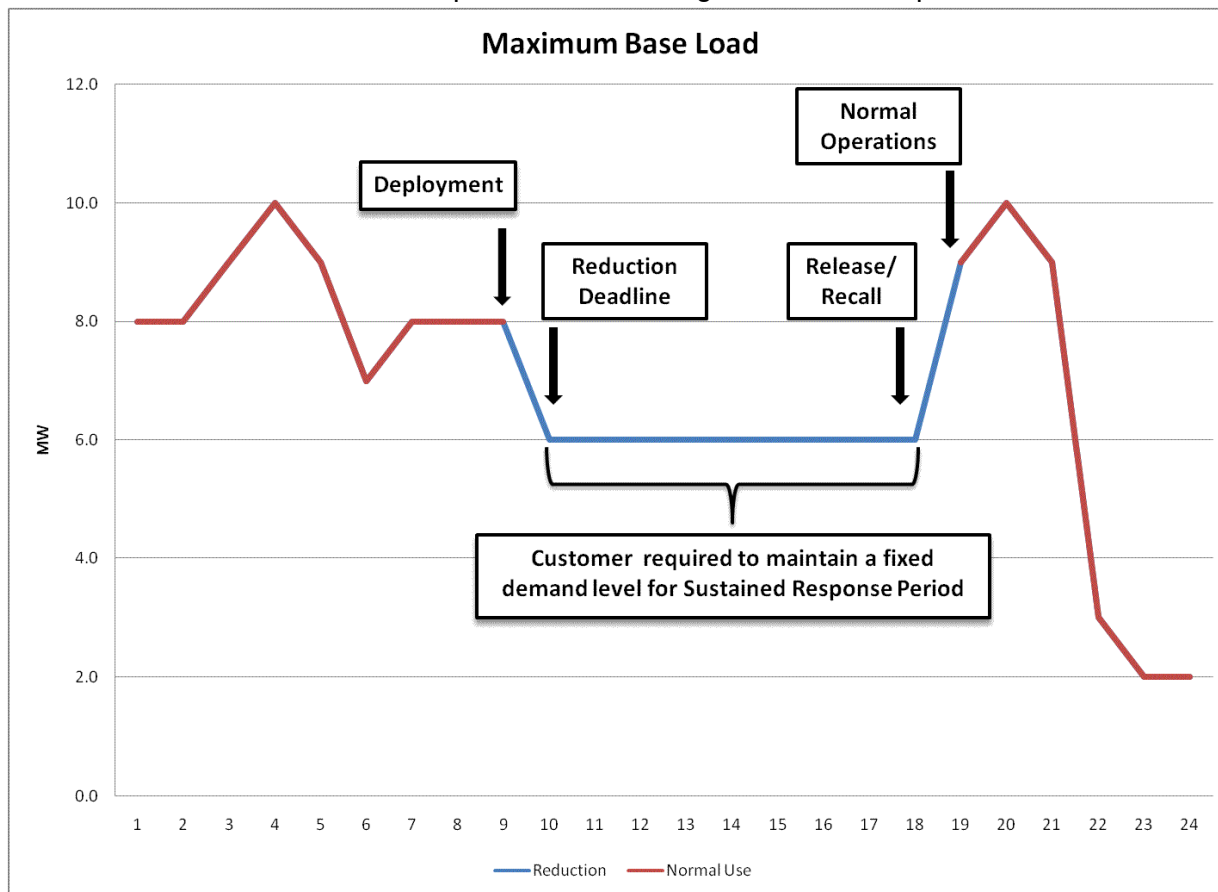


Figure 3. Maximum Base Load Illustration



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REQ.0.2.170 Meter Before / Meter After: A performance evaluation methodology where electricity Demand over a prescribed period of time prior to Deployment is compared to similar readings during the Sustained Response Period.

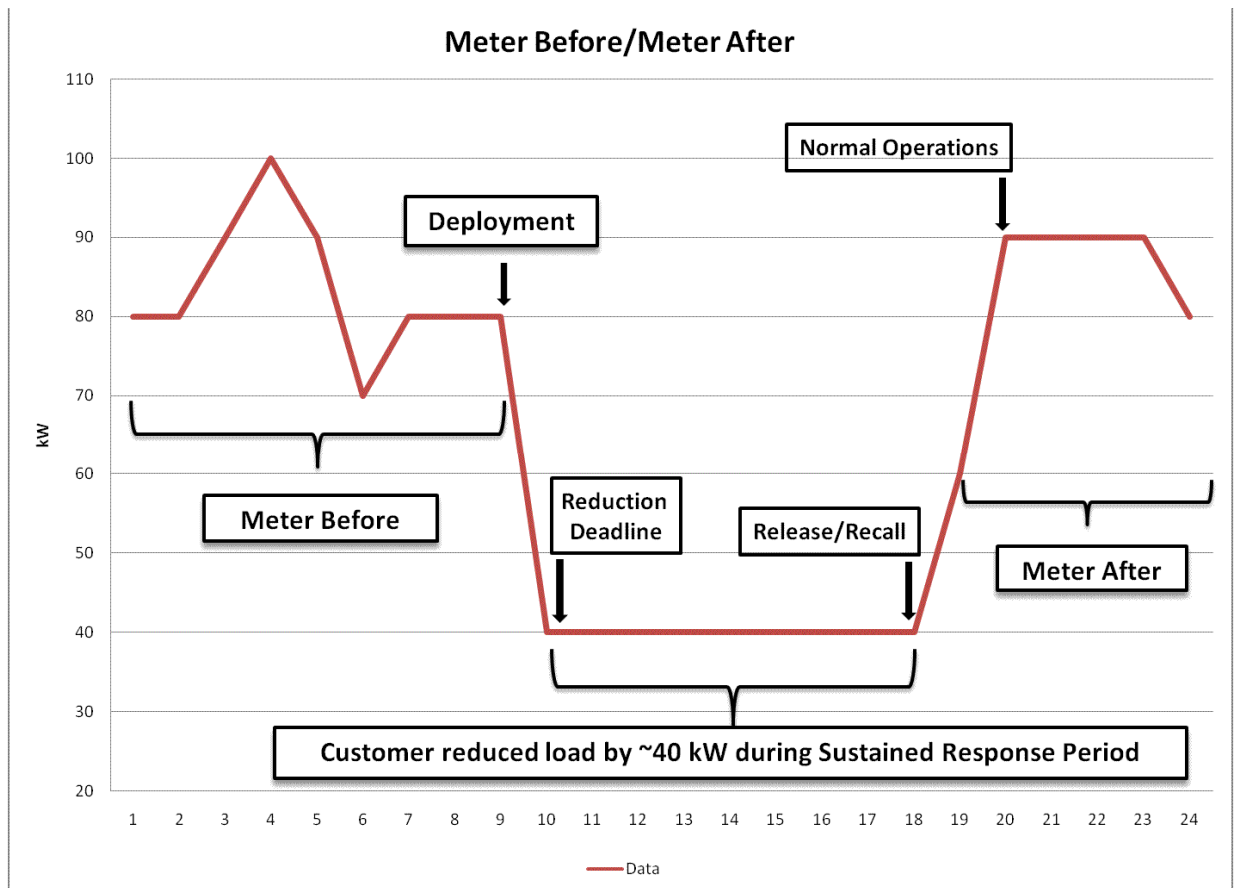


Figure 4. Meter Before/Meter After Illustration

REQ.0.2.171 Meter Data Recording Interval: The time between electricity meter usage recordings.

REQ.0.2.172 Meter Data Reporting Deadline: The maximum allowed time from the end of a Demand Response Event (Normal Operations) to the time when meter data is required to be submitted for performance evaluation and settlement. The Meter Data Reporting Deadline may be either relative (a number of hours/days after Normal Operations) or fixed (a fixed calendar time, such as end-of-month).

REQ.0.2.173 Metering Generator Output: A performance evaluation methodology in which the Demand Reduction Value is based on the output of a generator located behind the Demand Resource's revenue meter.



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- REQ.0.2.174 Non-Dispatchable Programs:** Programs in which Demand Resources curtail according to tariff structure, not in response to instructions from a Program Administrator.
- REQ.0.2.175 Non-Spinning Reserve:** Operating reserves that can be started, synchronized and loaded within a specified time period.
- REQ.0.2.176 Normal Operations:** The time following Release/Recall at which a Program Administrator may require a Demand Resource to have returned its Load usage to normal levels, and to be available again for Deployment.
- REQ.0.2.177 Operability Factor:** A net-to-gross percentage applied to the Demand Resource Availability Measurement, developed using a defined and documented testing protocol to verify both signal reception and device operation of the units in a retail Demand Response program, specific to a time period.
- REQ.0.2.178 Performance Window:** The period of time in a Demand Response Event analyzed by the Program Administrator to measure and verify the Demand Reduction Value for a Demand Resource.
- REQ.0.2.179 Program Administrator:** An investor-owned, governmental or cooperative utility with the responsibility for developing and operating Demand Response programs.
- REQ.0.2.180 Ramp Period:** The time between Deployment and Reduction Deadline, representing the period of time over which a Demand Resource is expected to achieve its change in Demand.
- REQ.0.2.181 Ramp Rate:** The rate, expressed in megawatts per minute, that a generator changes its output or a Demand Resource changes its Load.
- REQ.0.2.182 Real Time Pricing:** A retail rate in which the price for electricity fluctuates reflecting changes in the [wholesale\[T3\]](#) price of electricity.
- REQ.0.2.183 Recovery Period:** The time between Release/Recall and Normal Operations, representing the window over which Demand Resources are required to return to their normal Load.
- REQ.0.2.184 Reduction Deadline:** The time at the end of the Ramp Period when a Demand Resource is required to have met its Demand Reduction Value obligation.
- REQ.0.2.185 Regulation Service:** A type of Demand Response service in which a Demand Resource increases and decreases Load in response to real-time signals from the Program Administrator. Demand Resources providing Regulation Service are subject to dispatch continuously during a commitment period. Provision of Regulation Service does not correlate to time periods, deadlines and transitions in the Demand Response Event definition.



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- REQ.0.2.186 Release/Recall:** The time when the Program Administrator specifies a Deployment Period has ended or will end.
- REQ.0.2.187 Spinning Reserve:** Operating reserves from resources that are synchronized to the grid and can respond to instructions from the Program Administrator.
- REQ.0.2.188 Sustained Response Period:** The period of time between Reduction Deadline and Release/Recall over which a Demand Resource is required to deliver its obligated Demand Reduction Value.
- REQ.0.2.189 Telemetry:** Equipment for measuring a quantity and transmitting the result to a remote location for measurement, monitoring, display or recording.
- REQ.0.2.190 Telemetry Interval:** The unit of time between communications of telemetered data.
- REQ.0.2.191 Time-of-Use Rates:** Rates where usage unit prices vary by more than one time period within a 24-hour day to reflect the average cost of generating and delivering power during those time periods. Daily pricing blocks may include, but are not limited to, an on-peak, partial-peak, and an off-peak price for non-holiday weekdays, with the on-peak price as the highest price, and the off-peak price as the lowest price.
- REQ.0.2.192 Validation, Editing and Estimation:** The process of confirming the accuracy of raw meter data and, if necessary, replacing corrupt or missing data. VEE guidelines are published in the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering.



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REQ.13.3 Model Business Practices

REQ.13.3.1 General Characteristics of a Demand Response Event

- REQ.13.3.1.1** All actions taken in a Demand Response Event should be in accordance with the Governing Documents.
- REQ.13.3.1.2** Advance Notification: The Program Administrator should specify any requirements for the Advance Notification.
- REQ.13.3.1.3** The Program Administrator should initiate Deployment of the Demand Resource(s) depending on the specific circumstance(s) of the Demand Response Event.
- REQ.13.3.1.4** The Reduction Deadline will depend on the specific circumstance(s) of the Demand Response Event and should be specified by the Program Administrator.
- REQ.13.3.1.5** Any requirement(s) for a Ramp Period or a specified Ramp Rate will depend on the specific circumstance(s) of the Demand Response Event and should be specified by the Program Administrator.
- REQ.13.3.1.6** The Release / Recall will depend on the specific circumstance(s) of the Demand Response Event and should be specified by the Program Administrator.
- REQ.13.3.1.7** Any requirement for a return to Normal Operations will depend on the specific circumstance(s) of the Demand Response Event and the Recovery Period should be specified by the Program Administrator.

REQ.13.3.2 Measurement of Load

- REQ.13.3.2.1** Demand Response resource value may be estimated via Telemetry or After-the-Fact Metering or both.
- REQ.13.3.2.2** After-the-fact measurement is required either by metering each individual site or by statistical sampling.
- REQ.13.3.2.3** Meter accuracy should meet or exceed industry standards or as specified by the Applicable Regulatory Authority.
- REQ.13.3.2.4** Meters and other equipment should meet or exceed industry standards equivalent to ANSI C12 or as specified by the Applicable Regulatory Authority.
- REQ.13.3.2.5** The Meter Data Reporting Deadline should be specified in the Governing Documents.



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REQ.13.3.2.6 The Meter Data Recording Interval should be specified in the Governing Documents.

REQ.13.3.2.7 The meter clock / time accuracy should meet or exceed industry standards equivalent to ANSI C12 or as specified by the Applicable Regulatory Authority.

REQ.13.3.2.8 The method of Validating, Editing and Estimation should conform to an accepted methodology (such as the guidelines published in the current edition of the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering), and should be specified in the Governing Documents.

REQ.13.3.3 Statistical Sampling

REQ.13.3.3.1 The method of statistical sampling used should conform to an accepted methodology and should be specified in the Governing Documents. The following list provides examples of currently accepted methodologies:

- The Association of Edison Illuminating Companies (AEIC) Load Research Manual
 - Chapter 4 – Sample Design and Selection
 - Chapter 5 – Sample Implementation¹
- The Federal Energy Management Program M&V Guidelines: Measurement and Verification for Federal Energy Projects – Appendix B²;
- The California Energy Efficiency Evaluation Protocols³;
- The California Evaluation Framework – Chapter 13⁴; or
- The Independent System Operator (ISO)-New England Manual for Measurement and Verification of Demand Reduction Value from Demand Resources, Section 7⁵.

REQ.13.3.3.2 The general steps to be taken in statistical sampling are, but are not limited to:

- Define the population
- Design the sample to meet program objectives.

¹ Association of Edison Illuminating Companies (AEIC), *Load Research Manual*, 2nd ed., Birmingham, AL, 2001, www.aeic.org

² US Department of Energy. M&V Guidelines: Measurement and Verification for Federal Energy Management Projects Version 3.0. 2008. (or current version).

³ California Public Utilities Commission, *California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals*, 2006. (<http://www.cpuc.ca.gov/PUC/>)

⁴ California Public Utilities Commission, *The California Evaluation Framework*, current version. (<http://www.cpuc.ca.gov/PUC/>).

⁵ ISO-New England, *Manual for Measurement and Verification of Demand Resources*, (M-MVDR), current version. (http://www.iso-ne.com/rules_proceeds/isone_mnls/index.html).



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- Specify the listing of units available to be sampled which is sometimes called the sampling frame
- Identify design (auxiliary) variables
- Choose the sampling technique
 - o Choose stratification variable(s)
 - o Select allocation procedure
 - o Estimate means and variances of loads
 - o Examine sample size requirements
 - o Select sampling techniques and design
- Determine the sample size
- Identify those units to be in the sample
 - o Identify the criteria for selecting those units to be substituted for sample units who decline
 - o Select sample and alternates
 - o Validate sample
- Contacting and enroll the Customers to be in the sample, and install the metering devices, if needed
- Collect interval meter data.

REQ.13.3.3.3 The sample drawn should comport to a level of statistical significance that supports the goals of the program

REQ.13.3.4 Performance Evaluation Methods

Performance is evaluated through the use of one of the following methods unless otherwise specified by the Program Administrator:

- Maximum Base Load
- Meter Before / Meter After
- Baseline
- Metering Generator Output

REQ.13.3.4.1 Maximum Base Load Evaluation

REQ.13.3.4.1.1 Any requirement for real-time Telemetry data to be used to measure performance should be specified by the Program Administrator.

REQ.13.3.4.1.2 Any requirement for After-The-Fact Metering should be specified by the Program Administrator.



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- REQ.13.3.4.1.3** The Performance Window is the Sustained Response Period (Reduction Deadline through Release/Recall) unless otherwise specified by the Program Administrator.
- REQ.13.3.4.1.4** During the Performance Window, the Demand Resource must maintain its electricity consumption at or below the Maximum Base Load. The criteria used to evaluate performance is one of the following unless otherwise specified by the Program Administrator:
- Average Demand
 - Peak Demand
- REQ.13.3.4.2 Meter Before / Meter After Evaluation**
- REQ.13.3.4.2.1** The Program Administrator should specify the Baseline Window.
- REQ.13.3.4.2.2** During the Baseline Window, the Demand Reduction Value of the Demand Resource is evaluated using one of the following measurements as specified by the Program Administrator:
- Average Demand
 - Instantaneous Demand
 - Maximum Demand
- REQ.13.3.4.2.3** Statistical sampling is not used for this performance evaluation method, unless otherwise specified by the Program Administrator.
- REQ.13.3.4.2.4** The Program Administrator should specify any time periods to be excluded from Baseline Window.
- REQ.13.3.4.2.5** The Program Administrator should specify any Baseline Adjustments.
- REQ.13.3.4.2.6** No Adjustment Window is used for this model unless otherwise specified by the Program Administrator.
- REQ.13.3.4.2.7** The Program Administrator should specify if real-time Telemetry data is to be used to measure performance.
- REQ.13.3.4.2.8** After-The-Fact Metering should be used to measure performance, unless otherwise specified by the Program Administrator.
- REQ.13.3.4.2.9** The Performance Window is the Sustained Response Period (Reduction Deadline through Release/Recall) unless otherwise specified by the Program Administrator.



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- **REQ.13.3.4.2.10** During the Performance Window, the Demand Resource is evaluated using the same method of development of the Demand Reduction Value as identified in REQ.13.3.4.2.2.

REQ.13.3.4.2.11 The Program Administrator should specify any performance evaluation requirements for Highly-Variable Loads.

REQ.13.3.4.2.12 The Program Administrator should specify any performance evaluation requirements for on-site generation.

REQ.13.3.4.3 Baseline Evaluation

REQ.13.3.4.3.1 The Program Administrator should specify the Baseline Window.

REQ.13.3.4.3.2 The Program Administrator should specify the method of developing the Baseline value using, but not limited to, the following calculation types:

- Average kW over a specified interval
- Maximum kW over a specified interval
- Regression

REQ.13.3.4.3.3 Statistical sampling is generally permitted for this performance evaluation method, unless otherwise specified by the Program Administrator.

REQ.13.3.4.3.4 The Program Administrator should specify any rules for excluding data from the Baseline Window. Exclusion rules may be based on, but are not limited to the following:

- Historical Demand Response Events
- Testing/Audit Periods
- Calendar data
- Outages
- Weather emergencies or force majeure events
- Usage threshold
- Known, discrete load additions or reductions that have occurred during the Baseline Window

REQ.13.3.4.3.5 The Program Administrator should specify any rules for Baseline Adjustments. Adjustment rules may be based on, but are not limited to the following:

- Temperature



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- Humidity
- Calendar data
- Sunrise/Sunset time
- Event day operating conditions

REQ.13.3.4.3.6 The Program Administrator should specify the Adjustment Window.

REQ.13.3.4.3.7 The Program Administrator should specify if real-time Telemetry data is to be used to measure performance.

REQ.13.3.4.3.8 After-The-Fact Metering is used to measure performance, unless otherwise specified by the Program Administrator.

REQ.13.3.4.3.9 The Program Administrator should specify the Performance Window.

- **REQ.13.3.4.3.10** During the Performance Window, the Demand Resource is evaluated using the same method of development of the Baseline value as identified in REQ.13.3.4.3.2

REQ.13.3.4.3.11 The Program Administrator may specify performance evaluation requirements for Highly-Variable Loads.

REQ.13.3.4.3.12 The Program Administrator may specify performance evaluation requirements for on-site generation.

REQ.13.3.4.3.13 The Program Administrator should specify the testing protocol if an Operability Factor will be applied to the Demand Resource Availability Measurement.

REQ.13.3.4.4 Metering Generator Output Evaluation

REQ.13.3.4.4.1 The Program Administrator should specify Baseline calculations for Metering Generator Output.

REQ.13.3.4.4.2 The Program Administrator should specify if real-time Telemetry data is to be used to measure performance.

REQ.13.3.4.4.3 After-The-Fact Metering on the generator and optionally on the associated Load is used to measure performance unless otherwise specified by the Program Administrator.

REQ.13.3.4.4.4 The Program Administrator should specify the Performance Window.



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REQ.13.3.4.4.5 During the Performance Window, the Demand Resource is evaluated using the total measured generation output unless otherwise specified by the Program Administrator.

REQ.13.3.4.4.6 The Program Administrator should specify any special processing rules.



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4. SUPPORTING DOCUMENTATION

a. Description of Request:

b. Description of Recommendation:

The DSM-EE Subcommittee submits this Recommendation for 2010 Retail Annual Plan Item No. 3.c to support phase 2, retail development of Model Business Practices for Measurement & Verification (M&V) for Demand Response programs.

c. Business Purpose:

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):



**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

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1. RECOMMENDED ACTION:

☒ Accept as requested
☐ Accept as modified below
☐ Decline

**EFFECT OF EC VOTE TO ACCEPT
RECOMMENDED ACTION:**

☒ Change to Existing Practice
☐ Status Quo

2. TYPE OF DEVELOPMENT/MAINTENANCE**Per Request:**

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☐ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

Per Recommendation:

☐ Initiation
☒ Modification
☐ Interpretation
☐ Withdrawal

☒ Principle
☐ Definition
☒ Business Practice Standard
☐ Document
☐ Data Element
☐ Code Value
☐ X12 Implementation Guide
☐ Business Process Documentation

3. RECOMMENDATION**SUMMARY:**

The DSM-EE Subcommittee submits this Recommendation for 2010 Retail Annual Plan Item No. 3.c to support phase 2, retail development of Model Business Practices for Measurement & Verification (M&V) for Demand Response programs.

**NAESB REQ Recommendation
For Quadrant: Retail Electric Quadrant (REQ)**

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RECOMMENDED STANDARDS:**MEASUREMENT & VERIFICATION (M&V) OF DEMAND RESPONSE PROGRAMS****Table of Contents**

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Requesters: DSM-EE Subcommittee
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Request Title: Phase 2: M&V for Demand Response Programs

Executive Summary

This section provides a common framework of the Model Business Practices for Measurement and Verification (M&V) of Demand Response programs in retail electric markets. The purpose of these Model Business Practices is to provide:

- **Transparency:** accessible and understandable M&V protocols for Demand Response programs
- **Accountability:** criteria that will enable the Program Administrator to accurately estimate load impacts of Demand Response Resources; and
- **Consistency:** a process or protocol that will allow Program Administrators, Applicable Regulatory Authorities, or program participants to agree on the required steps to take to verify demand reductions resulting from Demand Response programs in retail energy markets.
- **Comprehensive:** strives to cover all forms of Demand Response

The purpose of this Standard is to ensure that regulatory commissions and participants in retail electric markets in which dispatchable Demand Response products are administered have access to uniform Measurement and Verification protocols that will enable them to develop consistent values for the load impact estimates of the programs.

These Model Business Practices were designed in concert with Wholesale Electric Quadrant Standards covering Demand Response programs operating in wholesale electric markets. ~~In the event of a conflict between these business practices and business practices developed by the Wholesale Electric Quadrant for products that are bid into wholesale markets, the Wholesale Electric Quadrant Standard should have precedence.~~ —Additionally, all Entities supplying Demand Response Services should comply with applicable North American Electric Reliability Corporation (NERC) reliability standards.

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Request Title:	Phase 2: M&V for Demand Response Programs

Introduction

The North American Energy Standards Board (NAESB) is a voluntary non-profit organization comprised of members from all aspects of the natural gas and electric industries. Within NAESB, the Retail Electric Quadrant (REQ) and the Retail Gas Quadrant (RGQ) focus on issues impacting the retail sale of energy to end-use customers. REQ / RGQ Model Business Practices are intended to provide guidance to Distribution Companies, Suppliers, and other Market Participants involved in providing energy service to end-use Customers. The focus of these Model Business Practices is performing M&V for Demand Response programs and is not intended to address Demand Response program design. These Model Business Practices are intended to be consistent with the Wholesale Electric Standards, but also acknowledge differences in product and program types between the two markets.

These Model Business Practices are voluntary and do not address policy issues that are the subject of state legislation or regulatory decisions. These Model Business Practices have been adopted with the realization that as the industry evolves, additional and amended Model Business Practices may be necessary. Any industry participant seeking additional or amended Model Business Practices (including principles, definitions, data elements, process descriptions, and technical implementation instructions) should submit a request to the NAESB office, detailing the change, so that the appropriate process may take place to amend the Model Business Practice.



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Business Processes and Practices

MEASUREMENT & VERIFICATION (M&V) OF DEMAND RESPONSE PROGRAMS

REQ.13 Overview

These M&V Model Business Practices establish criteria for the use of equipment, technology, and procedures to quantify the Demand Reduction Value delivered from retail demand response programs (product types). Model Business Practices developed may include commonalities among product types. The following outline of Model Business Practices is applicable to the Demand Response products.

General	Advance Notification
	Deployment Time
	Reduction Deadline
	Release/Recall
	Normal Operations
	Demand Resource Availability Measurement
	Aggregation
	Transparency of Requirements
Telemetry	Telemetry Requirement
	Telemetry Accuracy
	Telemetry Interval
	Other Telemetry Measurements
	Communication Protocol
	Governor Control Equivalent
	On-Site Generation Telemetry Requirement
After-The-Fact Metering	After-the-Fact Metering Requirement
	Meter Accuracy
	Details of Meter/Equipment Standards
	Meter Data Reporting Deadline
	Meter Data Reporting Interval
	Clock / Time Accuracy
	Validating, Editing & Estimating (VEE) Method
	On-Site Generation Meter Requirement
Performance Evaluation	Rules for Performance Evaluation



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For Demand Response products, a performance evaluation methodology is used to determine the Demand Reduction Value provided by a Demand Resource. The Model Business Practices include descriptions of acceptable Baselines and alternative performance measurements that are appropriate for each type of Demand Response products. The table below provides an outline of the applicable criteria for performance evaluation methodologies.

Baseline Information	Baseline Window
	Calculation Type
	Sampling Precision and Accuracy
	Exclusion Rules
	Baseline Adjustments
	Adjustment Window
Event Information	Use of Real-Time Telemetry
	Use of After-The-Fact Metering
	Performance Window
	Measurement Type
Special Processing	Highly-Variable Load Logic
	On-Site Generation Requirements

These Model Business Practices do not specify detailed characteristics of performance evaluation methodologies, but rather provide a framework that may be used to develop performance evaluation methodologies for specific Demand Response services. This approach is believed to be most appropriate at this time as development of performance evaluation methodologies and baseline calculations continues to mature. The following methodology types are applicable to retail Demand Response products:

- Maximum Base Load
- Meter Before / Meter After
- Baseline
- Metering Generator Output



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REQ.13.1 Principles

- REQ.13.1.1** The processes for M&V of Demand Response programs should be efficient to minimize the time and effort needed to accomplish these operational details.
- REQ.13.1.2** The processes for M&V of Demand Response programs should be consistent with the requirements set forth by the Applicable Regulatory Authority.
- REQ.13.1.3** The processes for M&V of Demand Response programs should minimize the occurrence of unauthorized activity in the marketplace.
- REQ.13.1.4** A contract or agreement between participants may establish different processes, timeframes, or operational requirements. Any conflict between these recommended processes and an applicable contract is resolved according to the provisions of the contract.
- REQ.13.1.5** These processes do not address contractual obligations between participants and their Customers, but because they are intended to be business practices, entities may incorporate them into contractual arrangements.
- REQ.13.1.6** All Customer specific data must remain confidential unless the parties otherwise agree.



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REQ.13.2 Definitions

REQ.13.2.A Business Definitions

REQ.0.2.145 Adjustment Window: The period of time prior to a Demand Response Event used for calculating a Baseline Adjustment.

REQ.0.2.146 Advance Notification(s): One or more communications to Demand Resources of an impending Demand Response Event in advance of the actual event.

REQ.0.2.147 After-the-Fact Metering: Interval meter data separate from Telemetry that is used to measure Demand Response. May not apply to Demand Resources under Baseline using statistical sampling.

RXQ.0.2.1 Applicable Regulatory Authority: The state regulatory agency or other local governing body that provides oversight, policy guidance, and direction to any parties involved in the process of providing energy to Retail Customers through regulation and orders.



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REQ.0.2.148 Baseline: A method of estimating the electricity that would have been consumed by a Customer or Demand Resource in the absence of a Demand Response Event. It may be calculated using interval metering and/or statistical sampling techniques. The figure below illustrates the concept of Baseline relative to a Demand Response Event.

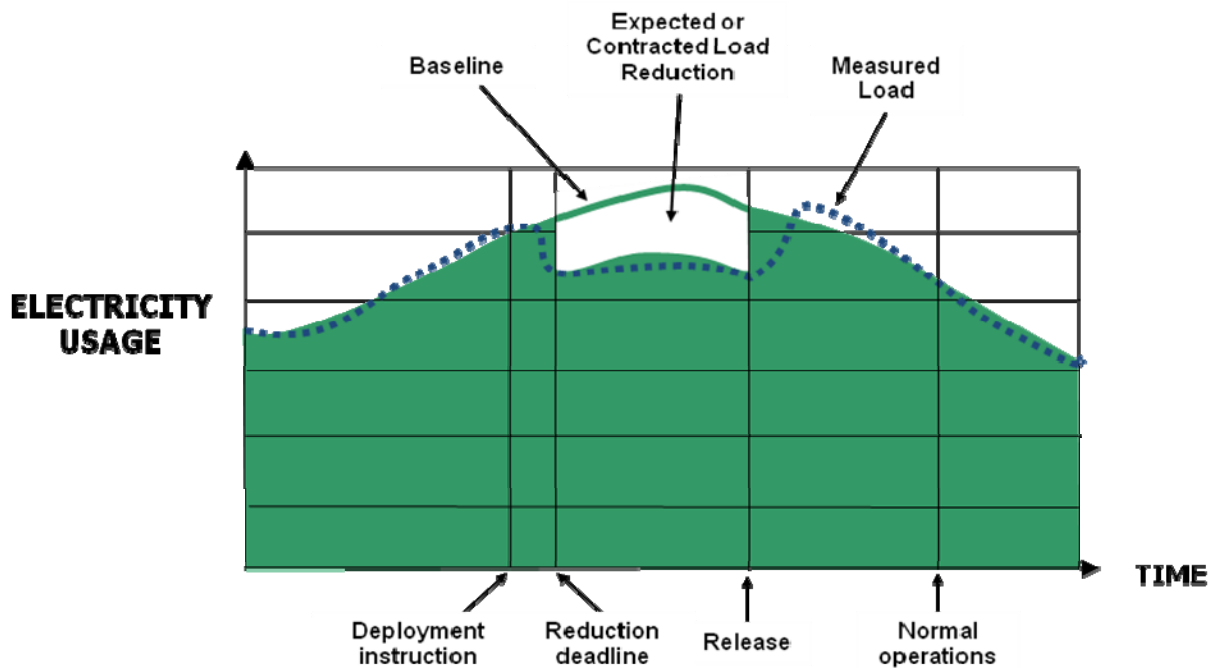


Figure 1. Illustration of Baseline Concept.

REQ.0.2.149 Baseline Adjustment: A modification to the Baseline to account for conditions immediately prior to or during a Demand Response Event to provide a better estimate of the energy the Demand Resource would have used but for the Demand Response Event. The adjustments may include but are not limited to weather conditions, near real time event facility Load, current Demand Resource operational information, or other parameters based on the Program Administrator's requirements.

REQ.0.2.150 Baseline Window: A period of time preceding and optionally following a Demand Response Event over which the electricity usage data is collected for the purpose of establishing a Baseline.

REQ.0.2.151 Capacity Service: A type of Demand Response service in which Demand Resources are obligated to control demand over a defined period of time measured in MW.

REQ.0.2.152 Critical Peak Pricing: A pricing structure in which the Customer receives notification identifying a time interval, ("critical hours") during which special higher prices apply over and above whatever other rate they may



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be charged. Critical hours generally represent a small percentage of the hours in the year.

RXQ.0.2.16 Customer: Any Entity that takes gas and/or electric service for its own usage.

REQ.0.2.153 Demand: The rate at which electric energy is delivered to or by a system or part of a system, generally expressed in kilowatts or megawatts, at a given instant or averaged over any designated interval of time; and the rate at which energy is being used by the Retail customer.

REQ.0.2.154 Demand Reduction Value: Measurement of reduced electricity usage by a Demand Resource during a Demand Response Event.

REQ.0.2.155 Demand Resource: A Load or aggregation of Loads capable of providing measurable and verifiable Demand Response.

REQ.0.2.156 Demand Resource Availability Measurement: The potential Demand Reduction Value available to be dispatched for a Demand Response Event.

REQ.0.2.157 Demand Response: A temporary change in electricity usage by a Demand Resource in response to market or reliability conditions. For purposes of these Model Business Practices, Demand Response does not include energy efficiency or permanent Load reduction.

For purposes of these Model Business Practices, this definition does not include energy efficiency or permanent Load reduction.



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REQ.0.2.158 Demand Response Event: A period of time defined by the Program Administrator, including notifications, deadlines, and transitions, during which Demand Resources provide Demand Response. All notifications, deadlines, and transitions may not be applicable to all Demand Response products or services.

The figure below represents the terms for timing events and time durations applicable to the characteristics of a dispatchable Demand Response Event. The definitions of the ten elements in the figure are the basis for describing the Timing of a Demand Response Event.

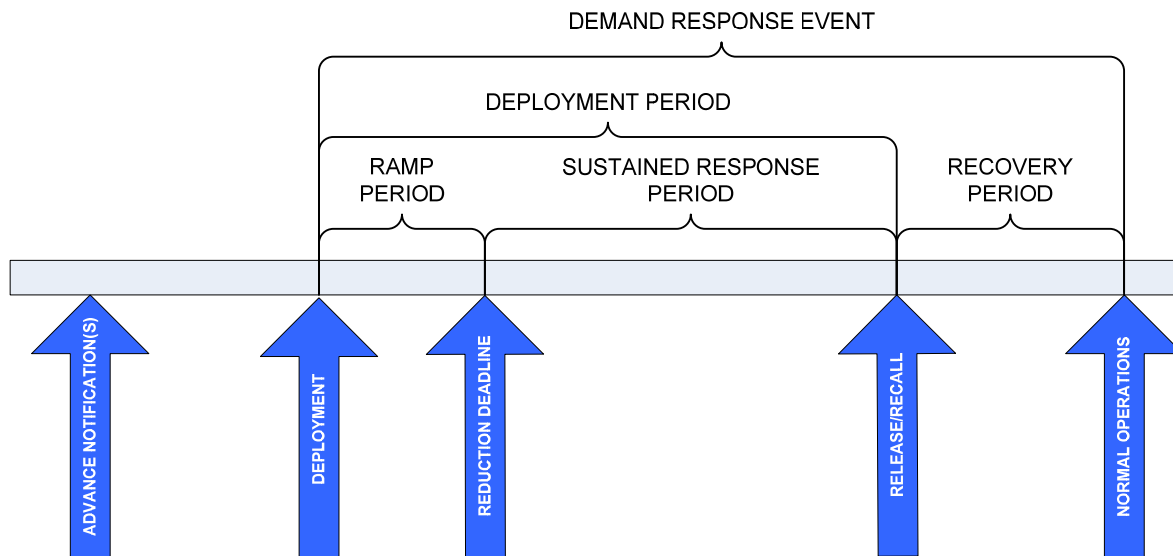


Figure 2. Timing of a Demand Response Event

REQ.0.2.159 Demand Response Provider: The Entity that is responsible for delivering Demand reductions from Demand Resources.

REQ.0.2.160 Deployment: The time at which a Demand Resource begins reducing Demand on the system in response to an instruction.

REQ.0.2.161 Deployment Period: The time in a Demand Response Event beginning with the Deployment and ending with the Release/Recall.

REQ.0.2.162 Direct Load Control: A Demand Response activity by which the program sponsor remotely shuts down or cycles a Customer's electrical equipment (e.g. air conditioner, water heater). Direct Load Control programs are primarily offered to residential or small commercial Customers.



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- REQ.0.2.163 Dispatchable Programs:** Programs that allow a Program Administrator to declare a Demand Response Event that has a specific start time and end time.
- RXQ.0.2.17 Distribution Company:** A regulated Entity which provides distribution services and may provide energy and/or transmission / transportation services in a given area.
- REQ.0.2.164 Energy Service:** A type of Demand Response service in which a Demand Resource provides a quantity of electricity measured in MWhs. .
- RXQ.0.2.47 Entity:** A person or organization with sufficient legal standing to enter into a contract or arrangement with another such person or organization (as such legal standing may be determined by those parties) for the purpose of conducting and/or coordinating energy transactions.
- REQ.0.2.165 Firm Service Level:** Demand level that a Customer must not exceed during a Demand Response Event.
- RXQ.0.2.22 Governing Documents:** Documents that determine the interactions among parties, including but not limited to: applicable law, regulatory documents (e.g., tariffs, rules, regulations), contractual agreements, Distribution Company Operational Manuals, and other relevant models and operational procedures.
- REQ.0.2.166 Guaranteed Load Drop:** Reduction of a specified amount of Load.
- REQ.0.2.167 Highly-Variable Load:** A Load with a fluctuating or unpredictable electricity usage pattern.
- REQ.0.2.168 Load:** An end-use device or customer that receives power from the electric system.



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REQ.0.2.169 Maximum Base Load: A performance evaluation methodology based solely on a Demand Resource's ability to maintain its electricity usage at or below a specified level during a Demand Response Event.

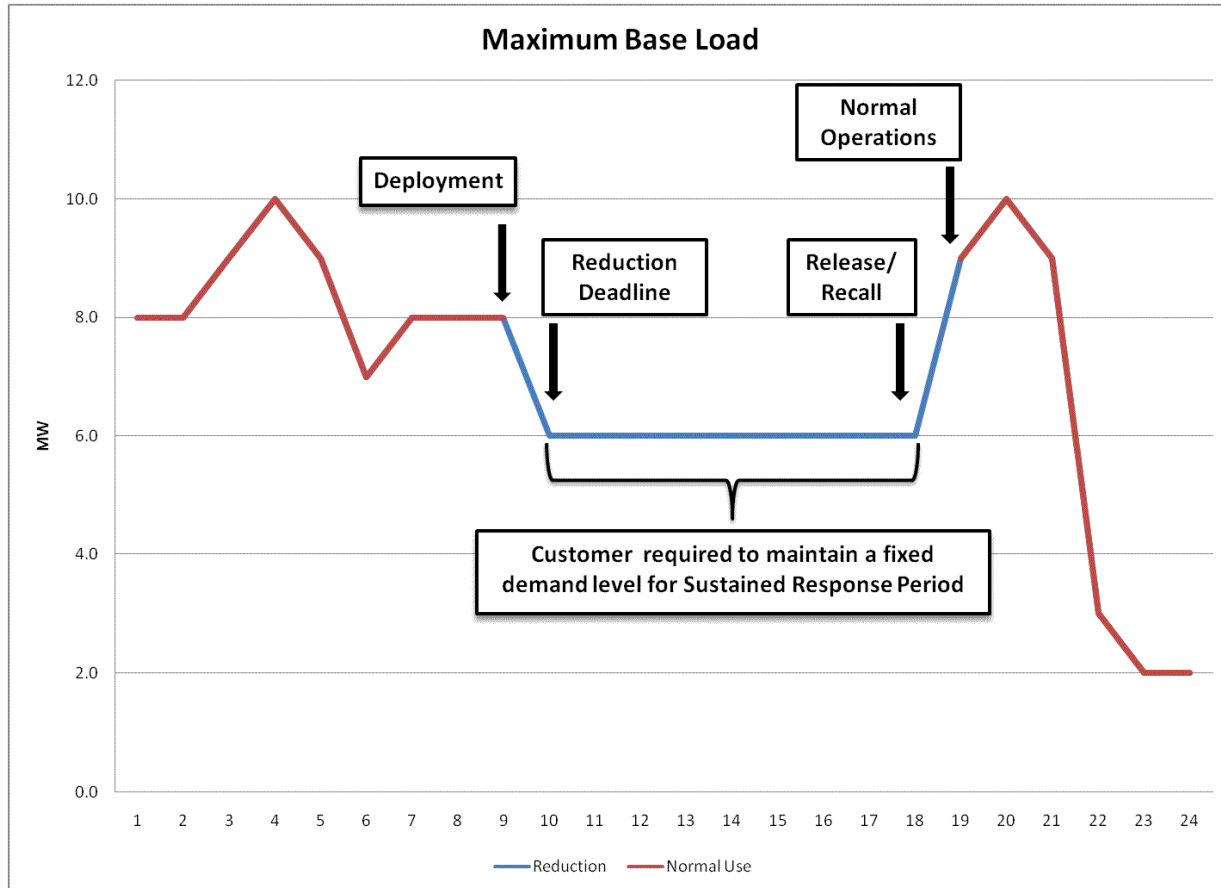


Figure 3. Maximum Base Load Illustration



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REQ.0.2.170 Meter Before / Meter After: A performance evaluation methodology where electricity Demand over a prescribed period of time prior to Deployment is compared to similar readings during the Sustained Response Period.

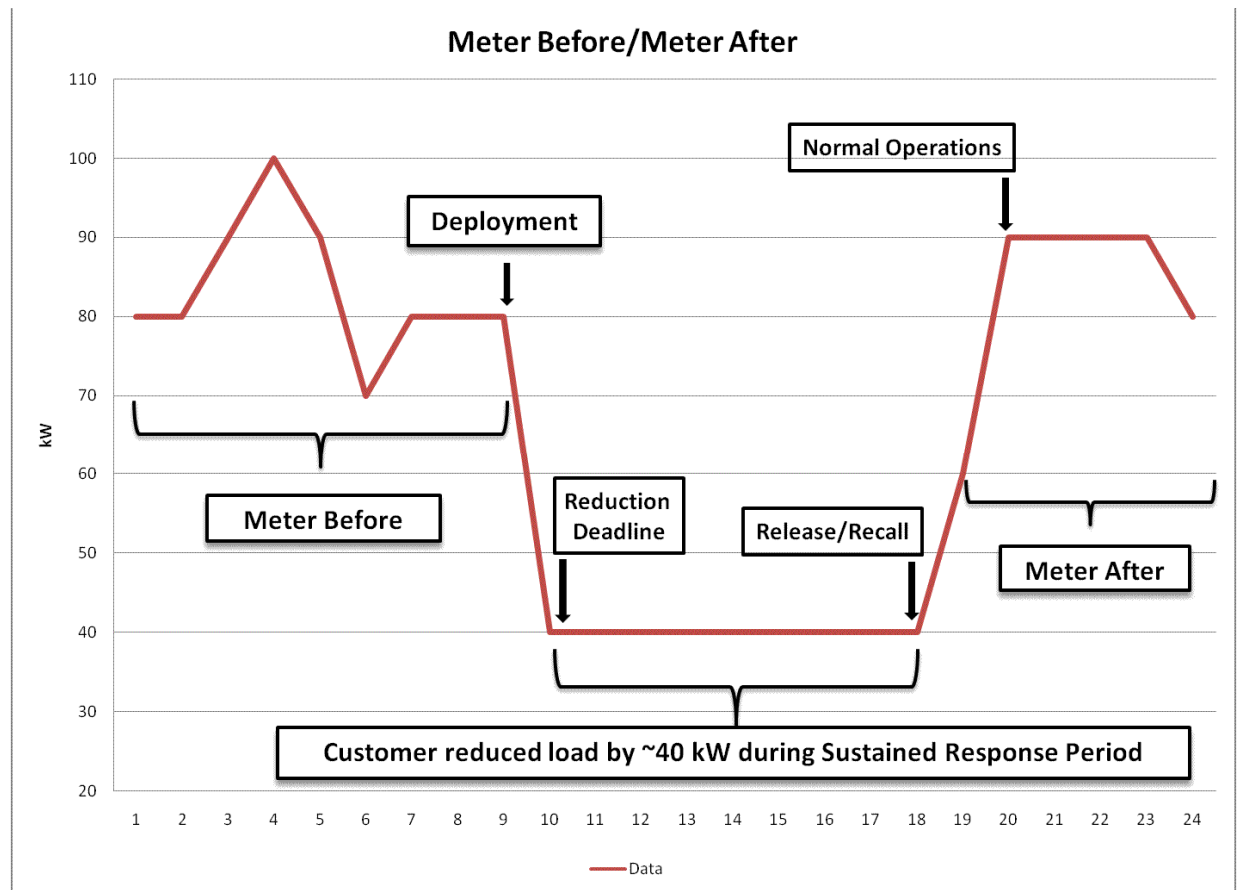


Figure 4. Meter Before/Meter After Illustration

REQ.0.2.171 Meter Data Recording Interval: The time between electricity meter usage recordings.

REQ.0.2.172 Meter Data Reporting Deadline: The maximum allowed time from the end of a Demand Response Event (Normal Operations) to the time when meter data is required to be submitted for performance evaluation and settlement. The Meter Data Reporting Deadline may be either relative (a number of hours/days after Normal Operations) or fixed (a fixed calendar time, such as end-of-month).

REQ.0.2.173 Metering Generator Output: A performance evaluation methodology in which the Demand Reduction Value is based on the output of a generator located behind the Demand Resource's revenue meter.



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- REQ.0.2.174 Non-Dispatchable Programs:** Programs in which Demand Resources curtail according to tariff structure, not in response to instructions from a Program Administrator.
- REQ.0.2.175 Non-Spinning Reserve:** Operating reserves that can be started, synchronized and loaded within a specified time period.
- REQ.0.2.176 Normal Operations:** The time following Release/Recall at which a Program Administrator may require a Demand Resource to have returned its Load usage to normal levels, and to be available again for Deployment.
- REQ.0.2.177 Operability Factor:** A net-to-gross percentage applied to the Demand Resource Availability Measurement, developed using a defined and documented testing protocol to verify both signal reception and device operation of the units in a retail Demand Response program, specific to a time period.
- REQ.0.2.178 Performance Window:** The period of time in a Demand Response Event analyzed by the Program Administrator to measure and verify the Demand Reduction Value for a Demand Resource.
- REQ.0.2.179 Program Administrator:** An investor-owned, governmental or cooperative utility with the responsibility for developing and operating Demand Response programs.
- REQ.0.2.180 Ramp Period:** The time between Deployment and Reduction Deadline, representing the period of time over which a Demand Resource is expected to achieve its change in Demand.
- REQ.0.2.181 Ramp Rate:** The rate, expressed in megawatts per minute, that a generator changes its output or a Demand Resource changes its Load.
- REQ.0.2.182 Real Time Pricing:** A retail rate in which the price for electricity fluctuates reflecting changes in the wholesale price of electricity.
- REQ.0.2.183 Recovery Period:** The time between Release/Recall and Normal Operations, representing the window over which Demand Resources are required to return to their normal Load.
- REQ.0.2.184 Reduction Deadline:** The time at the end of the Ramp Period when a Demand Resource is required to have met its Demand Reduction Value obligation.
- REQ.0.2.185 Regulation Service:** A type of Demand Response service in which a Demand Resource increases and decreases Load in response to real-time signals from the Program Administrator. Demand Resources providing Regulation Service are subject to dispatch continuously during a commitment period. Provision of Regulation Service does not correlate to time periods, deadlines and transitions in the Demand Response Event definition.



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REQ.0.2.186 Release/Recall: The time when the Program Administrator specifies a Deployment Period has ended or will end.

REQ.0.2.187 Spinning Reserve: Operating reserves from resources that are synchronized to the grid and can respond to instructions from the Program Administrator.

REQ.0.2.188 Sustained Response Period: The period of time between Reduction Deadline and Release/Recall over which a Demand Resource is required to deliver its obligated Demand Reduction Value.

REQ.0.2.189 Telemetry: [Telemetry refers to equipment providing communication signals between a Demand Resource or Demand Response Provider and the System Operator Equipment for measuring a quantity and transmitting the result to a remote location for measurement, monitoring, display or recording.](#)^[MSOffice1]

REQ.0.2.190 Telemetry Interval: The unit of time between communications of telemetered data.

REQ.0.2.191 Time-of-Use Rates: Rates where usage unit prices vary by more than one time period within a 24-hour day to reflect the average cost of generating and delivering power during those time periods. Daily pricing blocks may include, but are not limited to, an on-peak, partial-peak, and an off-peak price for non-holiday weekdays, with the on-peak price as the highest price, and the off-peak price as the lowest price.

REQ.0.2.192 Validation, Editing and Estimation: The process of confirming the accuracy of raw meter data and, if necessary, replacing corrupt or missing data. VEE guidelines are published in the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering.



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REQ.13.3 Model Business Practices

REQ.13.3.1 General Characteristics of a Demand Response Event

- REQ.13.3.1.1** All actions taken in a Demand Response Event should be in accordance with the [Governing Documents](#) [Program Administrator](#).
- REQ.13.3.1.2** Advance Notification: The Program Administrator should specify any requirements for the Advance Notification.
- REQ.13.3.1.3** The Program Administrator should initiate Deployment of the Demand Resource(s) depending on the specific circumstance(s) of the Demand Response Event.
- REQ.13.3.1.4** The Reduction Deadline will depend on the specific circumstance(s) of the Demand Response Event and should be specified by the Program Administrator.
- REQ.13.3.1.5** Any requirement(s) for a Ramp Period or a specified Ramp Rate will depend on the specific circumstance(s) of the Demand Response Event and should be specified by the Program Administrator.
- REQ.13.3.1.6** The Release / Recall will depend on the specific circumstance(s) of the Demand Response Event and should be specified by the Program Administrator.
- REQ.13.3.1.7** Any requirement for a return to Normal Operations will depend on the specific circumstance(s) of the Demand Response Event and the Recovery Period should be specified by the Program Administrator.

REQ.13.3.2 Measurement of Load

- REQ.13.3.2.1** Demand Response resource value may be estimated via Telemetry or After-the-Fact Metering or both.
- REQ.13.3.2.2** After-the-fact measurement is required either by metering each individual site or by statistical sampling.
- REQ.13.3.2.3** Meter accuracy should meet or exceed industry standards ~~or as specified by the Applicable Regulatory Authority~~.
- REQ.13.3.2.4** Meters and other equipment should meet or exceed industry standards equivalent to ANSI C12 ~~or as specified by the Applicable Regulatory Authority~~.
- REQ.13.3.2.5** The Meter Data Reporting Deadline should be specified ~~in the Governing Documents~~ [by the Program Administrator](#).



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REQ.13.3.2.6 The Meter Data Recording Interval should be specified ~~in the Governing Documents~~ by the Program Administrator.

REQ.13.3.2.7 The meter clock / time accuracy should meet or exceed industry standards equivalent to ANSI C12 ~~or as specified by the Applicable Regulatory Authority~~.

REQ.13.3.2.8 The method of Validating, Editing and Estimation should conform to an accepted methodology (such as the guidelines published in the current edition of the Edison Electric Institute's Uniform Business Practices for Unbundled Electricity Metering), and should be specified ~~in the Governing Documents~~ by the Program Administrator.

REQ.13.3.3 Statistical Sampling

REQ.13.3.3.1 The method of statistical sampling used should conform to an accepted methodology and should be specified ~~in the Governing Documents~~ by the Program Administrator. The following list provides examples of currently accepted methodologies:

- The Association of Edison Illuminating Companies (AEIC) Load Research Manual
 - Chapter 4 – Sample Design and Selection
 - Chapter 5 – Sample Implementation¹
- The Federal Energy Management Program M&V Guidelines: Measurement and Verification for Federal Energy Projects – Appendix B²;
- The California Energy Efficiency Evaluation Protocols³;
- The California Evaluation Framework – Chapter 13⁴; or
- The Independent System Operator (ISO)-New England Manual for Measurement and Verification of Demand Reduction Value from Demand Resources, Section 7⁵.

REQ.13.3.3.2 The general steps to be taken in statistical sampling are, but are not necessarily limited to:

- Define the population

¹ Association of Edison Illuminating Companies (AEIC), *Load Research Manual*, 2nd ed., Birmingham, AL, 2001, www.aeic.org

² US Department of Energy. M&V Guidelines: Measurement and Verification for Federal Energy Management Projects Version 3.0. 2008. (or current version).

³ California Public Utilities Commission, California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals, 2006. (<http://www.cpuc.ca.gov/PUC/>)

⁴ California Public Utilities Commission, The California Evaluation Framework, current version. (<http://www.cpuc.ca.gov/PUC/>).

⁵ ISO-New England, Manual for Measurement and Verification of Demand Resources, (M-MVDR), current version. (http://www.iso-ne.com/rules_proceeds/isone_mnls/index.html).



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- Design the sample to meet program objectives.
- Specify the listing of units available to be sampled which is sometimes called the sampling frame
- Identify design (auxiliary) variables
- Choose the sampling technique
 - o Choose stratification variable(s)
 - o Select allocation procedure
 - o Estimate means and variances of loads
 - o Examine sample size requirements
 - o Select sampling techniques and design
- Determine the sample size
- Identify those units to be in the sample
 - o Identify the criteria for selecting those units to be substituted for sample units who decline
 - o Select sample and alternates
 - o Validate sample
- Contacting and enroll the Customers to be in the sample, and install the metering devices, if needed
- Collect interval meter data.

REQ.13.3.3.3 The sample drawn should comport to a level of statistical significance that supports the goals of the program

REQ.13.3.4 Performance Evaluation Methods

Performance is evaluated through the use of one of the following methods unless otherwise specified by the Program Administrator:

- Maximum Base Load
- Meter Before / Meter After
- Baseline
- Metering Generator Output

REQ.13.3.4.1 Maximum Base Load Evaluation

REQ.13.3.4.1.1 Any requirement for real-time Telemetry data to be used to measure performance should be specified by the Program Administrator.

REQ.13.3.4.1.2 ~~Any requirement for After-The-Fact Metering should be specified by the Program Administrator.~~ Any requirement for After-The-Fact Metering should be specified by the Program Administrator. shall specify whether there is a need for real-time Telemetry to measure performance.



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REQ.13.3.4.1.3 The Performance Window is the Sustained Response Period (Reduction Deadline through Release/Recall) unless otherwise specified by the Program Administrator.

REQ.13.3.4.1.4 During the Performance Window, the Demand Resource must maintain its electricity consumption at or below the Maximum Base Load. The criteria used to evaluate performance is one of the following unless otherwise specified by the Program Administrator:

- Average Demand
- Peak Demand

REQ.13.3.4.2 Meter Before / Meter After Evaluation

REQ.13.3.4.2.1 The Program Administrator should specify the Baseline Window.

REQ.13.3.4.2.2 During the Baseline Window, the Demand Reduction Value of the Demand Resource is evaluated using one of the following measurements as specified by the Program Administrator:

- Average Demand
- Instantaneous Demand
- Maximum Demand

REQ.13.3.4.2.3 Statistical sampling is not used for this performance evaluation method, unless otherwise specified by the Program Administrator.

REQ.13.3.4.2.4 The Program Administrator should specify any time periods to be excluded from Baseline Window.

REQ.13.3.4.2.5 The Program Administrator should specify any Baseline Adjustments.

REQ.13.3.4.2.6 No Adjustment Window is used for this model unless otherwise specified by the Program Administrator.

REQ.13.3.4.2.7 The Program Administrator should specify if real-time Telemetry data is to be used to measure performance.

REQ.13.3.4.2.8 After-The-Fact Metering should be used to measure performance, unless otherwise specified by the Program Administrator.

REQ.13.3.4.2.9 The Performance Window is the Sustained Response Period (Reduction Deadline through Release/Recall) unless otherwise specified by the Program Administrator.



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- **REQ.13.3.4.2.10** During the Performance Window, the Demand Resource is evaluated using the same method of development of the Demand Reduction Value as identified in REQ.13.3.4.2.2.

REQ.13.3.4.2.11 The Program Administrator should specify any performance evaluation requirements for Highly-Variable Loads.

REQ.13.3.4.2.12 The Program Administrator should specify any performance evaluation requirements for on-site generation.

REQ.13.3.4.3 Baseline Evaluation

REQ.13.3.4.3.1 The Program Administrator should specify the Baseline Window.

REQ.13.3.4.3.2 The Program Administrator should specify the method of developing the Baseline value using, but not limited to, the following calculation types:

- Average kW over a specified interval
- Maximum kW over a specified interval
- Regression

REQ.13.3.4.3.3 Statistical sampling is generally permitted for this performance evaluation method, unless otherwise specified by the Program Administrator.

REQ.13.3.4.3.4 The Program Administrator should specify any rules for excluding data from the Baseline Window. Exclusion rules may be based on, but are not limited to the following:

- Historical Demand Response Events
- Testing/Audit Periods
- Calendar data
- Outages
- Weather emergencies or force majeure events
- Usage threshold
- Known, discrete load additions or reductions that have occurred during the Baseline Window

REQ.13.3.4.3.5 The Program Administrator should specify any rules for Baseline Adjustments. Adjustment rules may be based on, but are not limited to the following:

- Temperature



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- Humidity
- Calendar data
- Sunrise/Sunset time
- Event day operating conditions

REQ.13.3.4.3.6 The Program Administrator should specify the Adjustment Window.

REQ.13.3.4.3.7 The Program Administrator should specify if real-time Telemetry data is to be used to measure performance.

REQ.13.3.4.3.8 After-The-Fact Metering is used to measure performance, unless otherwise specified by the Program Administrator.

REQ.13.3.4.3.9 The Program Administrator should specify the Performance Window.

- **REQ.13.3.4.3.10** During the Performance Window, the Demand Resource is evaluated using the same method of development of the Baseline value as identified in REQ.13.3.4.3.2

REQ.13.3.4.3.11 The Program Administrator may specify performance evaluation requirements for Highly-Variable Loads.

REQ.13.3.4.3.12 The Program Administrator may specify performance evaluation requirements for on-site generation.

REQ.13.3.4.3.13 The Program Administrator should specify the testing protocol if an Operability Factor will be applied to the Demand Resource Availability Measurement.

REQ.13.3.4.4 Metering Generator Output Evaluation

REQ.13.3.4.4.1 The Program Administrator should specify Baseline calculations for Metering Generator Output.

REQ.13.3.4.4.2 The Program Administrator should specify if real-time Telemetry data is to be used to measure performance.

REQ.13.3.4.4.3 After-The-Fact Metering on the generator and optionally on the associated Load is used to measure performance unless otherwise specified by the Program Administrator.

REQ.13.3.4.4.4 The Program Administrator should specify the Performance Window.



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REQ.13.3.4.4.5 During the Performance Window, the Demand Resource is evaluated using the total measured generation output unless otherwise specified by the Program Administrator.

REQ.13.3.4.4.6 The Program Administrator should specify any special processing rules.



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4. SUPPORTING DOCUMENTATION

a. Description of Request:

b. Description of Recommendation:

The DSM-EE Subcommittee submits this Recommendation for 2010 Retail Annual Plan Item No. 3.c to support phase 2, retail development of Model Business Practices for Measurement & Verification (M&V) for Demand Response programs.

c. Business Purpose:

d. Commentary/Rationale of Subcommittee(s)/Task Force(s):



North American Energy Standards Board

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Home Page: www.naesb.org

January 18, 2011
Via email and posting

TO: NAESB Executive Committee (EC) Members, posting for interested parties
FROM: NAESB Office
cc: EC Alternates, Submitters, Subcommittee Chairs of Subcommittees noted in text below
RE: NAESB Triage Disposition for R10010 and R10011

Dear Triage Subcommittee and EC members,

Two requests were triaged on November 23, 2010 – R10010 and R10011 -- provided below as hyperlinks. There were no requests for conference call for discussion. The requests were triaged as follows:

For [R10010](#), submitted by [Mike Schisler](#) on behalf of Kinder Morgan:

This request is (1) found within scope; (2) to be assigned to the Wholesale Gas Quadrant (WGQ); and (3) because it is a request for Add data elements “Nominated Receipt Point Quantity” and “Nominated Delivery Point Quantity” to the (shipper) Scheduled Quantity document, the request should be assigned to the WGQ Business Practices Subcommittee (BPS). While there was nothing in the request indicating that it should be assigned a high priority, therefore, it should be addressed in the normal course of business of the WGQ BPS.

For [R10011](#), submitted by [Mike Schisler](#) on behalf of Kinder Morgan:

This request is (1) found within scope; (2) to be assigned to the Wholesale Gas Quadrant (WGQ); and (3) because it is a request to change the length of the GS02 “Application Sender’s Code” and GS03 “Application Receiver’s Code” from the current 12 characters to the ANSI standard 15 characters, the request should be assigned to the WGQ Information Requirements Subcommittee/Technical Subcommittee (IR/Tech). While there was nothing in the request indicating that it should be assigned a high priority, therefore, it should be addressed in the normal course of business of the WGQ IR/Tech.

If you have any questions on a specific request, please contact the requestor directly -- the email address is provided as a link with the request. The noted disposition for the requests including the requests were forwarded to the Triage Subcommittee and the EC members on November 9, 2010. There were no dissenting comments received. As such, the requests are considered in scope and assigned to the indicated subcommittees for development. Please note that this communication also serves as notice to the subcommittee chairs of the subcommittees to which the requests are assigned.



North American Energy Standards Board

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January 19, 2010
Via email and posting

TO: NAESB Executive Committee (EC) Members, posting for interested parties
FROM: NAESB Office
cc: EC Alternates, Submitters, Subcommittee Chairs of Subcommittees noted in text below
RE: NAESB Triage Actions Pending for Requests No. R10012, R11001 – R11006

Dear Triage Subcommittee and EC members,

We have seven requests to triage – R10012, and R11001 through R11006 -- provided below as hyperlinks. The NAESB office recommends the following actions:

For [R10012](#), submitted by [Mary Zientara](#) on behalf of Reliant Energy:

This request is (1) found within scope; (2) to be assigned to the Retail Electric Quadrant (REQ); and (3) because it is a request to develop retail electric model business practices for third party access to consumer smart grid data with considerations for data privacy practices those third parties should employ, it should be assigned to a REQ task force of the REQ portion of the Smart Grid PAP 10 subcommittee. While there was nothing in the request indicating that it should be assigned a high priority, therefore, it should be addressed in the normal course of business of the task force.

For [R11001](#), submitted by [Brian Troicuk](#) on behalf of Alliance Pipeline L.P.:

This request is (1) found within scope; (2) to be assigned to the Wholesale Gas Quadrant (WGQ); and (3) because it is a request to add a Reservation and AOS Charge code value to the data element "Rate Form/Type Code" under NAESB WGQ Standard Nos. 5.4.24 Offer, 5.4.25 Bids and 5.4.26 Award Download, it will be processed as a minor correction. The office will forward the request as a minor correction to the Information Requirements Subcommittee.

For [R11002](#), submitted by [Brian Troicuk](#) on behalf of Alliance Pipeline L.P.:

This request is (1) found within scope; (2) to be assigned to the Wholesale Gas Quadrant (WGQ); and (3) because it is a request to add several non-indexed based release code values to the data element Bidder Designation of Bidding Basis for NAESB WGQ Standard No. 5.4.25 Bid, it will be processed as a minor correction. The office will forward the request as a minor correction to the Information Requirements Subcommittee.

For [R11003](#), submitted by [Brian Troicuk](#) on behalf of Alliance Pipeline L.P.:

This request is (1) found within scope; (2) to be assigned to the Wholesale Gas Quadrant (WGQ); and (3) because it is a request to add several non-indexed based release code values to the data element "Bidder Designation of Bidding Basis for Standard 5.4.26 Award Download, it will be processed as a minor correction. The office will forward the request as a minor correction to the Information Requirements Subcommittee.

For [R11004](#), submitted by [Brian Troicuk](#) on behalf of Alliance Pipeline L.P.:

This request is (1) found within scope; (2) to be assigned to the Wholesale Gas Quadrant (WGQ); and (3) because it is a request to add Negotiated Non-Renewal Charge and AOS Charge data elements to the transactional reports including Firm Transportation, Capacity Release, and IT, it is assigned to the WGQ Business Practices Subcommittee. While there was nothing in the request indicating that it should be assigned a high priority, therefore, it should be addressed in the normal course of business of the task force.



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For [R11005](#), submitted by [Brian Troicuk](#) on behalf of Alliance Pipeline L.P.:

This request is (1) found within scope; (2) to be assigned to the Wholesale Gas Quadrant (WGQ); and (3) because it is a request to add a code value for the Affiliate Indicator for NAESB WGQ Standard Nos. 5.4.20 Capacity Release, 5.4.24 Offer, 5.4.25 Bid and 5.4.26 Award Download, it will be processed as a minor correction. The office will forward the request as a minor correction to the Information Requirements Subcommittee.

For [R11006](#), submitted by [Brian Troicuk](#) on behalf of Alliance Pipeline L.P.:

This request is (1) found within scope; (2) to be assigned to the Wholesale Gas Quadrant (WGQ); and (3) because it is a request to add non-negotiated based release code values to the data element "Releaser Designation of Acceptable Bidding Basis" for NAESB WGQ Standard No. 5.4.24 - Offer, it will be processed as a minor correction. The office will forward the request as a minor correction to the Information Requirements Subcommittee.

If you have any questions on a specific request, please contact the requestor directly -- the email address is provided as a link with the request. For additional information, the R10012 request was discussed at the December 2010 Board meeting in a presentation given by Ms. Zientara. If you have any concerns on the above actions, please respond via email with your concern stated, and we will convene a conference call for its resolution. Comments may certainly be provided and will be posted on the [Triage Subcommittee](#) page of the NAESB web site. If no concerns are raised, then on February 2, the dispositions as noted above will be considered approved.



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January 19, 2010
Via email and posting

TO: NAESB Executive Committee (EC) Members, posting for interested parties
FROM: NAESB Office
cc: EC Alternates, Submitters, Subcommittee Chairs of Subcommittees noted in text below
RE: NAESB Triage **REVISED** Actions Pending for Requests No. R10012, R11001 – R11006

Dear Triage Subcommittee and EC members,

We have seven requests to triage – R10012, and R11001 through R11006 -- provided below as hyperlinks. There are amendments to the recommended actions for R11001, R11002, R11003 and R11006 based on discussions with WGQ leadership, as the requested code value changes may not be supported by existing business practice standards. The NAESB office recommends the following revised actions highlighted in yellow:

For [R10012](#), submitted by [Mary Zientara](#) on behalf of Reliant Energy:

This request is (1) found within scope; (2) to be assigned to the Retail Electric Quadrant (REQ); and (3) because it is a request to develop retail electric model business practices for third party access to consumer smart grid data with considerations for data privacy practices those third parties should employ, it should be assigned to a REQ task force of the REQ portion of the Smart Grid PAP 10 subcommittee. While there was nothing in the request indicating that it should be assigned a high priority, therefore, it should be addressed in the normal course of business of the task force.

For [R11001](#), submitted by [Brian Troicuk](#) on behalf of Alliance Pipeline L.P.:

This request is (1) found within scope; (2) to be assigned to the Wholesale Gas Quadrant (WGQ); and (3) because it is a request to add a Reservation and AOS Charge code value to the data element "Rate Form/Type Code" under NAESB WGQ Standard Nos. 5.4.24 Offer, 5.4.25 Bids and 5.4.26 Award Download, it will be reviewed by the Business Practices Subcommittee for determination that the standards support the code value changes requested, and if so, it will then processed as a minor correction by the Information Requirements Subcommittee. There is nothing in the request that indicates a high priority, so if business practices changes are needed, the BPS will process in the normal course of business of the subcommittee.

For [R11002](#), submitted by [Brian Troicuk](#) on behalf of Alliance Pipeline L.P.:

This request is (1) found within scope; (2) to be assigned to the Wholesale Gas Quadrant (WGQ); and (3) because it is a request to add several non-indexed based release code values to the data element Bidder Designation of Bidding Basis for NAESB WGQ Standard No. 5.4.25 Bid, it will be reviewed by the Business Practices Subcommittee for determination that the standards support the code value changes requested, and if so, it will then processed as a minor correction by the Information Requirements Subcommittee. There is nothing in the request that indicates a high priority, so if business practices changes are needed, the BPS will process in the normal course of business of the subcommittee.

For [R11003](#), submitted by [Brian Troicuk](#) on behalf of Alliance Pipeline L.P.:

This request is (1) found within scope; (2) to be assigned to the Wholesale Gas Quadrant (WGQ); and (3) because it is a request to add several non-indexed based release code values to the data element "Bidder Designation of Bidding Basis for Standard 5.4.26 Award Download, it will be reviewed by the Business Practices Subcommittee for determination that the standards support the code value changes requested, and if so, it will then processed as a minor correction by the Information Requirements Subcommittee. There is nothing in the request that indicates a high priority, so if business practices changes are needed, the BPS will process in the normal course of business of the subcommittee.



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For [R11004](#), submitted by [Brian Troicuk](#) on behalf of Alliance Pipeline L.P.:

This request is (1) found within scope; (2) to be assigned to the Wholesale Gas Quadrant (WGQ); and (3) because it is a request to add Negotiated Non-Renewal Charge and AOS Charge data elements to the transactional reports including Firm Transportation, Capacity Release, and IT, it is assigned to the WGQ Business Practices Subcommittee. While there was nothing in the request indicating that it should be assigned a high priority, therefore, it should be addressed in the normal course of business of the subcommittee.

For [R11005](#), submitted by [Brian Troicuk](#) on behalf of Alliance Pipeline L.P.:

This request is (1) found within scope; (2) to be assigned to the Wholesale Gas Quadrant (WGQ); and (3) because it is a request to add a code value for the Affiliate Indicator for NAESB WGQ Standard Nos. 5.4.20 Capacity Release, 5.4.24 Offer, 5.4.25 Bid and 5.4.26 Award Download, it will be processed as a minor correction. The office will forward the request as a minor correction to the Information Requirements Subcommittee.

For [R11006](#), submitted by [Brian Troicuk](#) on behalf of Alliance Pipeline L.P.:

This request is (1) found within scope; (2) to be assigned to the Wholesale Gas Quadrant (WGQ); and (3) because it is a request to add non-negotiated based release code values to the data element "Releaser Designation of Acceptable Bidding Basis" for NAESB WGQ Standard No. 5.4.24 - Offer, it will be reviewed by the Business Practices Subcommittee for determination that the standards support the code value changes requested, and if so, it will then processed as a minor correction by the Information Requirements Subcommittee. There is nothing in the request that indicates a high priority, so if business practices changes are needed, the BPS will process in the normal course of business of the subcommittee.

If you have any questions on a specific request, please contact the requestor directly -- the email address is provided as a link with the request. For additional information, the R10012 request was discussed at the December 2010 Board meeting in a presentation given by Ms. Zientara. If you have any concerns on the above actions, please respond via email with your concern stated, and we will convene a conference call for its resolution. Comments may certainly be provided and will be posted on the [Triage Subcommittee](#) page of the NAESB web site. If no concerns are raised, then on February 2, the dispositions as noted above will be considered approved.



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NAESB UPDATE: VERSION 2.0 – WHOLESALE GAS QUADRANT (WGQ)
DECEMBER 17, 2010

ACTIONS TO BE APPLIED TO WGQ VERSION 1.9 TO CREATE WGQ VERSION 2.0:

Version 1.9 was published on September 30, 2009.

2009-10:

Final Actions:

2009 Annual Plan Item 3/2009 Annual Plan Item 2(a)/R07009 – Update Model ISDA North American Gas Annex, November 2004 to correspond to the updated Base Contract for Sale and Purchase of Natural Gas, dated September 5, 2005, in accordance with NAESB WGQ Request No. R07009 as adopted by the WGQ Executive Committee on October 29, 2009 - http://naesb.org/member_login_check.asp?doc=model_isda_addendum102909.pdf *(This is a model and does not require member ratification)*

R08020 – Provide for enhanced granularity for public utilities in identifying critical operational flow orders, - Approved by the WGQ EC on February 4, 2010.

Final Action: http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r08020.doc *(Ratified June 23, 2010)*

R09001 – Add two data elements to the Transactional Reporting – Interruptible Transportation Document (5.4.22) – Approved by the WGQ EC on February 4, 2010.

Final Action: http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r09001.doc *(Ratified June 23, 2010)*

R09011 - Change the term Power Plant Operator to Power Plant Gas Coordinator in WEQ-011 – Revised and approved by the WGQ EC on May 4, 2010.

Final Action: http://naesb.org/pdf4/r09011_rec.doc *(Ratified July 15, 2010)*

R08028/2010 WGQ Annual Plan Item 3/2009 WGQ Annual Plan Item 4/2008 WGQ Annual Plan Item 5 – Eliminate Standards 5.4.4. (Replacement Capacity);

Final Action: http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r08028_wgq_2010_api_3.doc ,

Attachment 1 Offer:

http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r08028_wgq_2010_api_3_attach1.doc ,

Attachment 2 Bid:

http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r08028_wgq_2010_api_3_attach2.doc ,

Attachment 3 Award Download:

http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r08028_wgq_2010_api_3_attach3.doc ,

Attachment 4 Withdrawal Download:

http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r08028_wgq_2010_api_3_attach4.doc ,

Attachment 5 Business Documentation:

http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r08028_wgq_2010_api_3_attach5.doc , and

Attachment 6 Principles/Standards/Interpretations as modified in redline:

http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r08028_wgq_2010_api_3_attach6.doc – revised by the WGQ EC on August 19, 2010 – *(Ratified September 27, 2010)*

R99033/R96018/R04028 – Redesign of Operationally Available and Unsubscribed data set

Final Action: http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r99033_r96018_r04038.doc ,

Attachment 1 Data Dictionary:

http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r99033_r96018_r04038_attach1.doc , and



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NAESB UPDATE: VERSION 2.0 – WHOLESALE GAS QUADRANT (WGQ) DECEMBER 17, 2010

Attachment 2 EDI Technical:

http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r99033_r96018_r04038_attach2.doc

Attachment 3 EDISM G873OACY:

http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r99033_r96018_r04038_attach3.rtf

Attachment 4 EDISM G873UNSC:

http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r99033_r96018_r04038_attach4.rtf - approved by the WGQ EC on August 19, 2010 – *(Ratified September 27, 2010)*

R08008 - Develop customer security administration standards

Final Action: http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r08008.doc - Approved by the WGQ EC on August 19, 2010 – *(Ratified September 27, 2010)*

R09006 - Add a new data element “Contract” in the following Transaction Datasets for the NAESB WGQ Version 1.8 release: NAESB WGQ Standard No. 3.4.2, Payment Remittance and NAESB WGQ Standard No. 3.4.4, Service Requester / Charge Allowance Invoice.

Final Action: http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r09006.doc - Approved by the WGQ EC on August 19, 2010 – *(Ratified September 27, 2010)*

R09021/R09022 – Change Charge Type conditionality in NAESB WGQ Standard No. 3.1.14.1 Transportation/Sales Invoice.

Final Action: http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r09021_r09022.doc - Approved by the WGQ EC on August 19, 2010 – *(Ratified September 27, 2010)*

R09025 – Create a new WGQ EDM standard

Final Action: http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r09025.doc - Approved by the WGQ EC on August 19, 2010 – *(Ratified September 27, 2010)*

2010 WGQ Annual Plan Item 5 – the NAESB WGQ EDM subcommittee reviews and updates to the NAESB WGQ technical standards per NAESB WGQ Standard No. 4.3.59.

Final Action: http://www.naesb.org/member_login_form.asp?doc=fa_wgq_2010_api_5.doc - Approved by the WGQ EC on August 19, 2010 – *(Ratified September 27, 2010)*

R10001 - Update the NAESB Wholesale Gas Quadrant (WGQ) Quadrant Electronic Delivery Mechanism (QEDM) Manual to add the ability to provide Informational Postings reports downloads in a CSV file format

Final Action: http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r10001.doc - Approved by the WGQ EC on August 19, 2010 – *(Ratified September 27, 2010)*

R09014 / 2010 WGQ Annual Plan Item 6 – Create a section/heading under Informational Postings called Regulatory to include all filings made to the FERC –

Final Action: http://www.naesb.org/member_login_form.asp?doc=fa_wgq_r09014_wgq_2010_ap_6.doc – revised/approved by the WGQ Executive Committee on October 5, 2010 *(Ratified November 5, 2010)*

Recommendations:

None



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NAESB UPDATE: VERSION 2.0 – WHOLESALE GAS QUADRANT (WGQ) DECEMBER 17, 2010

Minor Corrections:

MC10036 – Submitted by D. Davis, Williams Gas Pipeline – Minor corrections for the version 2.0 publication resulting from editorial review: http://www.naesb.org/pdf4/wgq_mc10036_rec_100710.doc - approved by the WGQ EC via notational ballot on October 17, 2010 - (*Effective date November 30, 2010*)

MC10030 – Submitted by Williams Gas Pipeline – Correction (Errata) to WGQ Version 1.9 – Standard No. 5.4.7 (Offer Upload) data dictionary for the condition of the data element Special Terms and Miscellaneous Notes – Storage Inventory Conditions: http://www.naesb.org/pdf4/wgq_mc10030_rec_081810.doc - approved by the WGQ EC on August 19, 2010 - (*Effective date October 7, 2010*)

MC10018 – Submitted by D. Davis and C. Burden, Williams Gas Pipeline for NAESB WGQ Version 2.0, NAESB WGQ Standard 2.4.3 – Allocation, NAESB WGQ Standard 2.4.4 – Shipper Imbalance and NAESB WGQ Standard 3.4.1 – Transportation/Sales Invoice: http://www.naesb.org/pdf4/wgq_mc10018_rec_081910.doc - approved by the WGQ EC on August 19, 2010 - (*Effective date October 7, 2010*)

MC10022 – Version 2.0 Add code value description “Deferred Asset Surcharge” with code value “DAS” to the list of standardized code values for the following datasets and data elements: 3.4.1, 5.4.1, 5.4.2, 5.4.3, 5.4.7, 5.4.8, 5.4.18, 5.4.19, 5.4.20, 5.4.21, 5.4.22, Submitted by T. Gwilliam, Iroquois Gas Transmission System, L.P. - http://www.naesb.org/pdf4/wgq_mc10022_rec_081910.doc - approved by the WGQ EC on August 19, 2010 - (*Effective date October 7, 2010*)

MC10024 – Version 2.0 Add additional Reduction Reason code value(s) to NAESB WGQ Standard No. 1.4.6, Submitted by R. Hogge, Dominion Transmission - http://www.naesb.org/pdf4/wgq_mc10024_rec_081910.doc - approved by the WGQ EC on August 19, 2010 - (*Effective date October 7, 2010*)

MC10026 – Version 2.0 Addition of a Code Value for the data element “Transaction Type” to the following data element “Transaction Type” to the following Transaction Data Sets: Nomination (1.4.1), Scheduled Quantity (1.4.5), Per-determined Allocation (2.4.1), Allocation (2.4.3), Shipper Imbalance (2.4.4), and Transportation/Sales Invoice (3.4.1), Submitted by K. Brooks, Williston Basin Interstate Pipeline Company - http://www.naesb.org/pdf4/wgq_mc10026_rec_081910.doc - approved by the WGQ EC on August 19, 2010 - (*Effective date October 7, 2010*)

MC10028 – This request proposes adding back the Code Value for the data element “Surcharge Indicator” to the following Transaction Data Sets: Offer Download (5.4.1), Bid Download (5.4.2) and Award Download (5.4.3), Submitted by M. Mahle, Transcanada - http://www.naesb.org/pdf4/wgq_mc10028_rec_081910.doc - approved by the WGQ EC on August 19, 2010 - (*Effective date October 7, 2010*)

MC10029 – NAESB WGQ Standards 4.3.54, Submitted by K. Brooks, Williston Basin Interstate Pipeline Company - http://www.naesb.org/pdf4/wgq_mc10029_rec_081910.doc - approved by the WGQ EC on August 19, 2010 - (*Effective date October 7, 2010*)

MC09034 Correct references in 3 lines of Section 4.12 of the NAESB WGQ Standard No. 6.3.3 – Electronic Data Trading Partner Agreement (Version 1.8), Submitted by C. Burden, Williams Gas Pipeline - http://www.naesb.org/pdf4/wgq_retail_mc09034_rec_011510.doc – approved by the WGQ EC via notational ballot January 15, 2010. (*Effective date September 27, 2010*)



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NAESB UPDATE: VERSION 2.0 – WHOLESALE GAS QUADRANT (WGQ) DECEMBER 17, 2010

MC09035 Information Requirements/Technical Subcommittee – corrections to Transaction set Tables and ANSI X12 mapping in NAESB WGQ Standard Nos. 5.4.1 – Offer Download and 5.4.3 – Award Download (Version 1.9) http://www.naesb.org/pdf4/wgq_mc09035_rec_011510.doc – approved by the WGQ EC via notational ballot January 15, 2010. *(Effective date September 27, 2010)*

MC10009 – Version 1.9 (Errata) for: NAESB WGQ Standard No.5.4.1 (Offer Download), NAESB WGQ Standard No.5.4.2 (Bid Download) and NAESB WGQ Standard No.5.4.3 (Award Download), Submitted by D. Davis, Williams Gas Pipeline - Recommendation: http://www.naesb.org/pdf4/wgq_mc10009_rec_080610.doc - approved by the WGQ EC on August 6, 2010. *(Effective date September 27, 2010)*

MC10010 – Version 1.9 (Errata) for NAESB WGQ Standard No.5.4.20 (Transactional Reporting – Capacity Release), Submitted by D. Davis, Williams Gas Pipeline - Recommendation: http://www.naesb.org/pdf4/wgq_mc10010_rec_080610.doc - approved by the WGQ EC on August 6, 2010. *(Effective date September 27, 2010)*

MC10011 – Version 1.9 (Errata) for NAESB WGQ Standard Nos.3.4.1 (Transportation/Sales Invoice), Submitted by D. Davis, Williams Gas Pipeline - Recommendation: http://www.naesb.org/pdf4/wgq_mc10011_rec_080610.doc - approved by the WGQ EC on August 6, 2010. *(Effective date September 27, 2010)*

MC10014 – Version 1.9 (Errata) for NAESB WGQ Standard No.5.4.18 (Bid Upload), Submitted by D. Davis/M. Stender, Co-Chairs Information Requirements/Technical Subcommittee – Recommendation: http://www.naesb.org/pdf4/wgq_mc10014_rec_080610.doc - approved by the WGQ EC on August 6, 2010. *(Effective date September 27, 2010)*

MC10015 – Version 1.9 (Errata) to NAESB WGQ Standard No.5.4.15 (Response to Upload of Request for Download of Posted Datasets), Submitted by D. Davis/M. Stender, Co-Chairs Information Requirements/Technical Subcommittee – Recommendation http://www.naesb.org/pdf4/wgq_mc10015_rec_080610.doc - approved by the WGQ EC on August 6, 2010. *(Effective date September 27, 2010)*

MC10016 – Version 1.9 (Errata) for NAESB WGQ Version 1.9 Standard No.3.4.1 (Transportation/Sales Invoice), Submitted by D. Davis/M. Stender, Co-Chairs Information Requirements/Technical Subcommittee – Recommendation http://www.naesb.org/pdf4/wgq_mc10016_rec_080610.doc - approved by the WGQ EC on August 6, 2010. *(Effective date September 27, 2010)*

MC10017 - Version 1.9 (Errata) to NAESB WGQ Standard No. 2.4.6 – Measurement Volume Audit Statement, Submitted by D. Davis/M. Stender, Co-Chairs Information Requirements/Technical Subcommittee – Recommendation http://www.naesb.org/pdf4/wgq_mc10017_rec_080610.doc - approved by the WGQ EC on August 6, 2010. *(Effective date September 27, 2010)*

MC10019 - Minor Correction Submitted by D. Davis, Williams Gas Pipeline for NAESB WGQ Version 1.9: Joint NAESB WEQ Version 002.1 Standard WEQ-014-A and WGQ Version 1.0 Standard No. 11.4.1 (Implementation Guide for Electronic Tariff Filing): http://www.naesb.org/pdf4/wgq_weq_mc10019_revised.doc - revised/approved by the WEQ EC on August 17, 2010 and the WGQ EC on August 19, 2010. *(Effective date October 7, 2010)*



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MC10020 – Version 1.9 (Errata) for NAESB WGQ Capacity Release, Submitted by D. Davis/M. Stender, Co-Chairs Information Requirements/Technical Subcommittee – Recommendation: http://www.naesb.org/pdf4/wgq_mc10020_rec_080610.doc - approved by the WGQ EC on August 6, 2010. (Effective date September 27, 2010)

MC10021 – Version 1.9 (Errata) to NAESB WGQ Standard 5.4.22, Submitted by K. Brooks, Williston Basin Interstate Pipeline, Company – Recommendation: http://www.naesb.org/pdf4/wgq_mc10021_rec_080610.doc - approved by the WGQ EC on August 6, 2010. (Effective date September 27, 2010)

MC10023 – Version 1.9 (Errata) to the offer Download – NAESB WGQ Standard No. 5.4.1 – PID Segment and Correct the Technical Implementation of Business Process for Confirmation Response – NAESB WGQ Standard No. 1.4.4, Submitted by D. Davis/M. Stender, Co-Chairs Information Requirements/Technical Subcommittee - http://www.naesb.org/pdf4/wgq_mc10023_rec_080610.doc - approved by the WGQ EC on August 6, 2010. (Effective date September 27, 2010)

MC10025 – Version 1.9 (Errata) for NAESB WGQ Internet Electronic Transport (Internet ET) Manual and NAESB RXQ Internet ET Manual, Version 1.2, Submitted by C. Burden, Joint WGQ Information Requirements/Technical Subcommittee - http://www.naesb.org/pdf4/wgq_req_rgq_mc10025_rec_080610.doc - approved by the WGQ EC on August 6, 2010. (Effective date September 27, 2010)

MC10027 - Errata to NAESB WGQ Version 1.9: Correct the condition for the data element Amendment Reporting in the following data sets: Transactional Reporting - Capacity Release (NAESB WGQ Standard No. 5.4.20), Transactional Reporting – Firm Transportation (NAESB WGQ Standard No. 5.4.21) and Transactional Reporting – Interruptible Transportation (NAESB WGQ Standard No. 5.4.22), Submitted by D. Davis/M. Stender, Co-Chairs Information Requirements/Technical Subcommittee - http://www.naesb.org/pdf4/wgq_mc10027_rec_080610.doc - approved by the WGQ EC on August 6, 2010. (Effective date September 27, 2010)

MC10012 –Errata for NAESB WGQ Internet Electronic Transport (Internet ET) Manual, Version 1.9 and NAESB RXQ Internet ET Manual Version 1.2: http://www.naesb.org/pdf4/wgq_req_rgq_mc10012_rec_030510.doc - approved by the WGQ and Retail ECs on March 5, 2010 (Effective date July 7, 2010)

MC10001 - Revised - Minor Correction Submitted by M. Stender, El Paso Natural Gas to NAESB standard 5.4.1, 5.4.2 and 5.4.17 version 1.9: http://www.naesb.org/pdf4/wgq_mc10001_rec_020410.doc - approved by the WGQ EC on February 4, 2010. (Effective date April 19, 2010)

MC10002/R09019 - Minor Correction (errata to Version 1.9) to modify three and add one new Allocation Transaction Type Code Values and modify the Allocation Transaction Type Matrix accordingly in the following data set: Allocation, NAESB WGQ Standard No. 2.4.3 (Note: This recommendation corrects the actions taken for R05028 which were published in Version 1.9.): http://www.naesb.org/pdf4/wgq_mc10002_rec_020410.doc - approved by the WGQ EC on February 4, 2010. (Effective date April 19, 2010)

MC10003 - Minor Correction to Version 1.9 NAESB WGQ Standard No. 2.2.4 – Shipper Imbalance (EDI Implementation: ASC X12 Mapping Guidelines and Data Element Cross Reference): http://www.naesb.org/pdf4/wgq_mc10003_rec_020410.doc - approved by the WGQ EC on February 4, 2010. (Effective date April 19, 2010)



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NAESB UPDATE: VERSION 2.0 – WHOLESALE GAS QUADRANT (WGQ) DECEMBER 17, 2010

MC10005 - Recommendation – Submitted by C. Burden, Williams Gas Pipeline – This request proposes the correction of language for the NAESB WGQ Version 1.9 release: NAESB WGQ Standard 4.3.16:
http://www.naesb.org/pdf4/wgq_mc10005_rec_020410.doc - approved by the WGQ EC on February 4, 2010.
(Effective date April 19, 2010)

MC10006 Recommendation – Submitted by C. Burden, Williams Gas Pipeline – This request proposes corrections to NAESB WGQ Standards Booklet 1 of 2, NAESB WGQ QEDM Standards Manual and NAESB WGQ Capacity Release Standards Manual to correct an error in wording:
http://www.naesb.org/pdf4/wgq_mc10006_rec_020410.doc - approved by the WGQ EC on February 4, 2010.
(Effective date April 19, 2010)

MC10007 Recommendation – Submitted by C. Burden, Williams Gas Pipeline – This request proposes corrections to NAESB WGQ QEDM Standards Manual, Version 1.9 to correct browser and plug-in information and a spelling correction: http://www.naesb.org/pdf4/wgq_mc10007_rec_020410.doc - approved by the WGQ EC on February 4, 2010. (Effective date April 19, 2010)

MC10008 Recommendation – Submitted by D. Davis / M. Stender, Chair / Co-Chair WGQ Information Requirements / WGQ Technical Subcommittees – This request proposes corrections to NAESB WGQ Standard Nos. 3.4.1 (Transportation/Sales Invoice) and 3.4.4 (Service Requester Level Charge/Allowance Invoice, Version 1.9 to correct the code values in the Code Values Dictionaries:
http://www.naesb.org/pdf4/wgq_mc10008_rec_020410.doc - approved by the WGQ EC on February 4, 2010.
(Effective date April 19, 2010)

MC09024 Recommendation - Submitted by M. Schmitz, Northern Natural Gas - This request proposes the addition of 1 code values for the data element "Validation Code (Detail)" in the following datasets for the NAESB WGQ Version 1.9 release: NAESB WGQ Standard 1.4.2 - Nomination Quick Response
http://www.naesb.org/pdf4/wgq_mc09024_rec_011810.doc - approved by the WGQ EC on February 4, 2010.
(Effective date April 19, 2010)

MC09033 Recommendation - Submitted by M. Schmitz, Northern Natural Gas - This request proposes the addition of 4 code values for the data element "Charge Type" in the following datasets for the NAESB WGQ Version 1.9 release: NAESB WGQ Standard 3.4.1 – Transportation / Sales Invoice:
http://www.naesb.org/pdf4/wgq_mc09033_rec_011910.doc - approved by the WGQ EC on February 4, 2010.
(Effective date April 19, 2010)

MC09032 Minor Correction to the Canadian Addendum, dated August 2, 2007 (NAESB Standard 6.3.1.CA) as submitted by K. Sappenfield, Chair, WGQ Contracts Subcommittee -
http://www.naesb.org/pdf4/wgq_mc09032_rec_102909.doc - approved by the WGQ EC on October 29, 2009
(Effective date December 14, 2009)

Minor Corrections to published Version 2.0 after November 30, 2010:

MC10035 Minor Correction for the Version 1.9 Internet Electronic Transport (Internet ET) Manual and NAESB RXQ Internet ET Manual Version 1.2 as submitted by T. Roza, GXS -
http://www.naesb.org/pdf4/wgq_retail_mc10035_rec_102210.doc - approved by the NAESB Retail ECs on October 27, 2010 and NAESB WGQ EC on October 28, 2010 (Effective date December 17, 2010)



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NAESB UPDATE: VERSION 2.0 – WHOLESALE GAS QUADRANT (WGQ) DECEMBER 17, 2010

MC10037 Minor Correction for the Version 2.0 publication resulting from editorial review as submitted by D. Davis, Williams Gas Pipeline - http://www.naesb.org/pdf4/wgq_mc10037_rec_110410.doc - approved by the WGQ EC via notational ballot on November 16, 2010 (*Effective date January 2, 2011*)

MC10039 Minor Correction Errata for NAESB WGQ Version 2.0 - NAESB WGQ Standard No. 4.3.29, NAESB WGQ Standard No. 5.4.16 – System-Wide Notices, Data Element Cross Reference, EDI X12 Mapping Guidelines as submitted by D. Davis and C. Burden, Williams Gas Pipeline - http://www.naesb.org/pdf4/wgq_mc10039_rec_111010.doc - approved by the WGQ EC via notational ballot on November 17, 2010 (*Effective date January 2, 2011*)

MC10041 Minor Correction Errata for NAESB WGQ Version 2.0 - Joint WEQ/WGQ Minor Correction to the NAESB WEQ/WGQ Implementation Guide for Electronic Tariff Filing to correspond to modifications made by FERC to its Implementation Guide for Electronic Filing of Parts 25, 154, 284, 300, and 241 Tariff Filings as noted in the FERC eTariff RSS Feed(s), dated October 8, 2010 (<http://www.ferc.gov/docs-filing/etariff/implementation-guide.pdf>) as submitted by D. Rager, NAESB - http://www.naesb.org/pdf4/weq_wgq_mc10041_122010.doc - approved by the WEQ and WGQ ECs via Notational Ballot on December 20, 2010 (*Effective date February 3, 2011*)

TIMELINE:

- Version 2.0 is scheduled for publication no earlier than November 1, 2010 and no later than November 30, 2010.
- To back into this date – all standards should be ratified by date of publication, and EC actions should be taken one month prior, to publication, all subcommittee actions should be taken three months prior to publication.

Month - 4	Subcommittee Recommendations Completed and sent out for comment
Month - 3	EC Actions taken
Month - 2	Ratifications sent out and completes, minor corrections applied
Month - 1	Review of draft publication
Month - 0	Date of Publication.



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NAESB UPDATE: VERSION 2.0 – WHOLESALE GAS QUADRANT (WGQ)
DECEMBER 17, 2010

Items not to be included:

R09017 – Develop a new ISDA Gas Confirmation Form for use with the ISD Gas Annex based on the current Confirmation Form under the NAESB Base Contract for Sale and Purchase of Natural Gas –
http://naesb.org/member_login_form.asp?doc=wgq_rat011310_r09017_rec.doc - Ratification on February 12, 2010.

Attachment (Exhibit A):

http://naesb.org/member_login_form.asp?doc=wgq_rat011310_r09017_rec_attachment.doc



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NAESB UPDATE: VERSION 2.1 – WHOLESALE GAS QUADRANT (WGQ)
JANUARY 12, 2011

ACTIONS TO BE APPLIED TO WGQ VERSION 2.0 TO CREATE WGQ VERSION 2.1:

Version 2.0 was published on November 30, 2010.

2011-12:

Final Actions:

None

Recommendations:

R10007 - Change the Offer, Bid and Award downloads to have the ability to communicate multiple indexed rates for a given offer.

Recommendation: http://www.naesb.org/pdf4/wgq_r10007_rec_123010.doc

Request for Formal Comments - http://www.naesb.org/pdf4/wgq_010311reqcom.doc - comment period ends February 2, 2011

No comments received as of 01/12/2011

R09018 - Add MA data element Path Rank in the Nominations data set and corresponding error message in the Nom QR.

Recommendation: http://www.naesb.org/pdf4/wgq_r09018_rec_123010.doc

Request for Formal Comments - http://www.naesb.org/pdf4/wgq_010311reqcom.doc - comment period ends February 2, 2011

No comments received as of 01/12/2011

Minor Corrections:

MC10038 - For NAESB WGQ Version 2.1, additional code values for the data elements Transaction Type and Reduction Reason Code in the following data sets as appropriate: Nomination (1.4.1), Confirmation Response (1.4.4), Scheduled Quantity (1.4.5), Scheduled Quantity for Operators (1.4.6), and Confirmation Response data sets as needed to support these requirements.

Recommendation: http://www.naesb.org/pdf4/wgq_mc10038_rec_123010.doc - WGQ EC Notational Ballot Due January 18, 2011

MC10040 - For NAESB WGQ Version 2.1, NAESB WGQ Standard No. 0.4.2 – Operational Capacity, NAESB WGQ Standard No. 1.4.1 – Nomination, NAESB WGQ Standard No. 1.4.3 – Request for Confirmation, NAESB WGQ Standard No. 1.4.4 – Confirmation Response, NAESB WGQ Standard No. 1.4.5 – Scheduled Quantity, NAESB WGQ Standard No. 1.4.6 – Scheduled Quantity for Operator, NAESB WGQ Standard No. 5.4.20 – Transactional Reporting – Capacity Release, NAESB WGQ Standard No. 5.4.21 – Transactional Reporting – Firm Transportation, NAESB WGQ Standard No. 5.4.24 – Offer, NAESB WGQ Standard No. 5.4.25 – Bid, and NAESB WGQ Standard No. 5.4.26 – Award Download.

Recommendation: http://www.naesb.org/pdf4/wgq_mc10040_rec_123010.doc - WGQ EC Notational Ballot Due January 18, 2011



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NAESB UPDATE: VERSION 2.1 – WHOLESALE GAS QUADRANT (WGQ) JANUARY 12, 2011

TIMELINE:

- Version 2.1 is scheduled for publication no earlier than November 1, 2011 and no later than November 30, 2011.
- To back into this date – all standards should be ratified by date of publication, and EC actions should be taken one month prior, to publication, all subcommittee actions should be taken three months prior to publication.

Month - 4	Subcommittee Recommendations Completed and sent out for comment
Month - 3	EC Actions taken
Month - 2	Ratifications sent out and completes, minor corrections applied
Month - 1	Review of draft publication
Month - 0	Date of Publication.



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**NAESB UPDATE: VERSION 002.2 – WHOLESALE ELECTRIC QUADRANT (WEQ)
JANUARY 12, 2011**

ACTIONS TO BE APPLIED TO WEQ VERSION 002.1 TO CREATE WEQ VERSION 002.2:

Version 002.1 was published on March 11, 2009.

2009-10:

Final Actions:

2008 WEQ Annual Plan Item 5(a) – Review and develop business practice standards to support DR and DSM-EE programs – Ratified March 16, 2009 - http://naesb.org/member_login_check.asp?doc=fa_weq_2008_api5a.doc (New WEQ-015)

2009 WEQ Annual Plan Item 3(d) – Order 717, Standards of Conduct – Ratified June 15, 2009 - http://naesb.org/member_login_check.asp?doc=fa_weq_2009_api_3d.doc (WEQ-001, WEQ-002, WEQ-003)

2009 WEQ Annual Plan Item 2(a)(ii)(3) – Rollover Rights on Redirect on a Firm Basis – Ratified July 27, 2009 - http://naesb.org/member_login_check.asp?doc=fa_weq_2009_ap_2aii3.doc (WEQ-001, WEQ-002, WEQ-003, WEQ-013)

2009 WEQ Annual Plan Item 1(a), 3(a)(vii)/R05020 – Modifications to WEQ-004 Coordinate Interchange as approved by the WEQ EC on October 27, 2009 – Ratified December 14, 2009 - http://naesb.org/member_login_form.asp?doc=fa_weq_2009_api_1a_3avii_r05020.doc (WEQ-001, WEQ-002, WEQ-003, WEQ-004, WEQ-013)

Attachment: http://naesb.org/member_login_form.asp?doc=fa_weq_2009_api_1a_3avii_r05020_attach.doc

2009 WEQ Annual Plan Item 5(b) – Modify NAESB definition to address internal inconsistencies and inconsistencies with the NERC glossary – approved by the WEQ EC on February 2, 2010 – Ratified March 24, 2010 - http://naesb.org/member_login_check.asp?doc=fa_weq_2009_api5b.doc

2009 WEQ Annual Plan Items 5(a)(2), 5(i)/R08004/R09011 – Multiple Annual Plan Items affecting WEQ-011 Gas/Electric Coordination – Approved by the WEQ EC on June 11, 2010 via Notational Ballot. – Ratified July 15, 2010 - http://www.naesb.org/member_login_form.asp?doc=fa_weq_2009_api_5a2_5i_r08004_r09011.doc

Attachments: http://www.naesb.org/member_login_form.asp?doc=fa_weq_2009_api_5a2_5i_r08004_r09011_attach1.doc

2009 WEQ Annual Plan Items 3(a)(ii)(1)/R07013 - Develop a Confidentiality Agreement - http://www.naesb.org/pdf4/weq_2009_api_3aii1_r07013_rec.doc - Approved by the WEQ EC on May 4, 2010 (**No further action needed**)

2010 WEQ Annual Plan Item No. 6.a - Requirements Specifications for Common Electricity Product and Pricing Definition – for NIST PAP03 as revised by the WEQ EC on July 7, 2010 – Ratified August 21, 2010 - http://www.naesb.org/member_login_form.asp?doc=fa_weq_2010_api_6a.doc



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NAESB UPDATE: VERSION 002.2 – WHOLESALE ELECTRIC QUADRANT (WEQ) JANUARY 12, 2011

2010 WEQ Annual Plan Item No. 6.b - Requirements Specifications for Common Scheduling Mechanism for Energy Transactions – for NIST PAP04 as revised by the WEQ EC on July 7, 2010 – Ratified August 21, 2010 - http://www.naesb.org/member_login_form.asp?doc=fa_weq_2010_api_6b.doc

2010 WEQ Annual Plan Item No. 6.c - Requirements Specifications for Wholesale Standard DR Signals - for NIST PAP09 as revised by the WEQ EC on July 7, 2010 – Ratified August 21, 2010 - http://www.naesb.org/member_login_form.asp?doc=fa_weq_2010_api_6c.doc

2010 WEQ Annual Plan Item 6d – Business Practices and Information Models to Support Priority Action Plan 10 – Standardized Energy Usage Information as approved by the WEQ EC on October 29, 2010 – Ratified November 29, 2010 - http://www.naesb.org/member_login_form.asp?doc=fa_weq_2010_ap_6d.doc

2010 WEQ Annual Plan Item 1.a.i – Interim Solution for Parallel Flow Visualization as revised by the WEQ EC on October 26, 2010 and approved via notational ballot on November 3, 2010 – Ratified December 6, 2010 - http://www.naesb.org/member_login_form.asp?doc=fa_weq_2010_api_1ai.doc

Recommendations:

2009 WEQ Annual Plan Item 2(a)(i)(1-8) – Develop business practice standards to better coordinate the use of the transmission system among neighboring transmission providers. Such business practice standards would be based on recommendations from NERC's Long Term ATC/AFC Task Force and would involve revised procedures for the ATC calculation and/or revised protocols as determined by the final order. Development is using joint standards development process with NERC. Request R050004 was expanded to include the Order No. 890 ([Docket Nos. RM05-25-000 and RM05-17-000](#)) and Order No. 890-A ([Docket Nos. RM05-17-001, 002 and RM05-25-001, 002](#)), "Preventing Undue Discrimination and Preference in Transmission Services," issued April 11, 2007). Group 3: Network Service on OASIS – Recommendation currently under development by the WEQ OASIS Subcommittee http://naesb.org/weq/weq_oasis.asp

2009 Annual Plan Item 2.a.i.1 through 2.a.i.8 and 3.a.i - Network Service on OASIS – Recommendation currently under development by the WEQ OASIS Subcommittee.

Draft Recommendation: http://www.naesb.org/pdf4/weq_oasis062110reqcom_a1.doc

Request for Informal Comments - http://www.naesb.org/pdf4/weq_oasis062110reqcom.doc - ended July 12, 2010

2010 WEQ Annual Plan Item 1.d – Monitor and develop NAESB business practices as needed to complement NERC reliability standards for FAC-012 and FAC-013

Recommendation: http://www.naesb.org/pdf4/weq_2010_api_1d_rec.doc

Request for Formal Comments - http://www.naesb.org/pdf4/weq_092410_reqcom.doc - comment period ended October 25, 2010

2010 WEQ Annual Plan Item 6 – Master Data Requirements List for Standards associated with NIST PAP03 and PAP09

Recommendation: http://www.naesb.org/pdf4/weq_2010_ap6_rec_101510.doc

Request for Formal Comments - http://www.naesb.org/pdf4/weq_101510_reqcom.doc - comment period ended November 15, 2010



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NAESB UPDATE: VERSION 002.2 – WHOLESALE ELECTRIC QUADRANT (WEQ) JANUARY 12, 2011

2010 WEQ Annual Plan Item 6a – Phase 2: Requirements Specifications for Common Electricity Product and Pricing Definition for NIST PAP03

Recommendation Phase 2: http://www.naesb.org/pdf4/weq_2010_ap6a_rec_101510.doc

Request for Formal Comments - http://www.naesb.org/pdf4/weq_101510_reqcom.doc - *comment period ended November 15, 2010*

2010 WEQ Annual Plan Item 6b – Phase 2: Requirements Specifications for Common Scheduling Mechanism for Energy Transactions for NIST PAP04

Recommendation Phase 2: http://www.naesb.org/pdf4/weq_2010_ap6b_rec_101510.doc

Request for Formal Comments - http://www.naesb.org/pdf4/weq_101510_reqcom.doc - *comment period ended November 15, 2010*

2010 WEQ Annual Plan Item 6c – Phase 2: Requirements Specifications for Wholesale Standard DR Signals for NIST PAP09

Recommendation Phase 2:

redline: http://www.naesb.org/pdf4/weq_2010_ap_6c_rec_101510_redline.pdf

clean: http://www.naesb.org/pdf4/weq_2010_ap_6c_rec_101510_clean.doc

Request for Formal Comments - http://www.naesb.org/pdf4/weq_101510_reqcom.doc - *comment period ended November 15, 2010*

2010 WEQ Annual Plan Item 4d - Business Practice Standards for Measurement Verification of Energy Efficiency Products

Recommendation: http://www.naesb.org/pdf4/weq_2010_api_4d_rec_redline.doc (Redline),

http://www.naesb.org/pdf4/weq_2010_api_4d_rec_clean.doc (Clean)

Request for Formal Comments - http://www.naesb.org/pdf4/weq_120810_reqcom.doc - *comment period ends January 14, 2011*

2010 WEQ Annual Plan Items 4a and 4b - Review and develop business practice standards to support DR and DSM-EE programs (DR Phase 2)

Recommendation: http://www.naesb.org/pdf4/weq_2010_api_4a_4b_rec_redline.doc (Redline),

http://www.naesb.org/pdf4/weq_2010_api_4a_4b_rec_clean.doc (Clean)

Request for Formal Comments - http://www.naesb.org/pdf4/weq_120810_reqcom.doc - *comment period ends January 14, 2011*

Minor Corrections:

Minor Correction MC10041, Submitted by D. Rager, NAESB - Joint WEQ/WGQ Minor Correction to the NAESB WEQ/WGQ Implementation Guide for Electronic Tariff Filing to correspond to modifications made by FERC to its Implementation Guide for Electronic Filing of Parts 25, 154, 284, 300, and 241 Tariff Filings as noted in the FERC eTariff RSS Feed(s), dated October 8, 2010: http://www.naesb.org/pdf4/weq_wgq_mc10041_122010.doc - approved by the WEQ and WGQ ECs via Notational Ballot on December 20, 2010 (*Effective date February 3, 2011*)

Minor Correction MC10033, Submitted by Y. Coleman, Bonneville Power Administration – Book 2.1, WEQ-003 Data Dictionary and WEQ-013 Implementation Guide: http://www.naesb.org/pdf4/weq_mc10033_102610.doc - approved by the WEQ EC on October 26, 2010 (*Effective date January 3, 2011*)



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NAESB UPDATE: VERSION 002.2 – WHOLESALE ELECTRIC QUADRANT (WEQ) JANUARY 12, 2011

Minor Correction MC10032, Submitted by E. Skiba, JT. Wood, N. Saini, M.Otondo – WEQ 2010 AP Item 1.a.i – Interim Solution for Parallel Flow Visualization: http://www.naesb.org/pdf4/weq_mc10032_102610.doc - revised/approved by the WEQ EC on October 26, 2010 (*Effective date January 3, 2011*)

Minor Correction MC10019, Submitted by D. Davis, Williams Gas Pipeline for NAESB WGQ Version 1.9: Joint NAESB WEQ Version 002.1 Standard WEQ-014-A and WGQ Version 1.0 Standard No. 11.4.1 (Implementation Guide for Electronic Tariff Filing): http://www.naesb.org/pdf4/wgq_weq_mc10019_revised.doc - revised/approved by the WEQ EC on August 17, 2010 and the WGQ EC on August 19, 2010 – (*Effective date October 7, 2010*)

Minor Correction MC10031, WEQ-001 Minor Correction to be applied to Version 002.2, Submitted by M. Goldberg, ISO New England Inc.: http://www.naesb.org/pdf4/weq_mc10031_revised.doc - revised/approved by the WEQ EC on August 17, 2010 - (*Effective date October 7, 2010*)

Minor Correction for WEQ-001 to be applied to versions 002.1 and 002.2 submitted by JT Wood, Southern Company: http://www.naesb.org/pdf4/weq_mc111209_attach1_revised.doc - approved by the WEQ Executive Committee on October 27, 2009 - (*Effective date December 14, 2009*)

TIMELINE:

- Version 002.2 is scheduled for publication end of second quarter 2011.
- To back into this date – all standards should be ratified by date of publication, and EC actions should be taken one month prior, to publication, all subcommittee actions should be taken three months prior to publication.

Month - 4	Subcommittee Recommendations Completed and sent out for comment
Month - 3	EC Actions taken
Month - 2	Ratifications sent out and completes, minor corrections applied
Month - 1	Review of draft publication
Month - 0	Date of Publication.



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NAESB UPDATE: VERSION 1.3 – RETAIL ELECTRIC AND RETAIL GAS QUADRANT (REQ/RGQ) DECEMBER 16, 2010

ACTIONS TO BE APPLIED TO RETAIL VERSION 1.2 TO CREATE RETAIL VERSION 1.3:

Version 1.2 was published on December 31, 2009.

2009-10:

Final Actions:

2010 Retail Annual Plan Item No. 9.a (REQ Final Action) - Requirements Specifications for Common Electricity Product and Pricing Definition – for NIST PAP03 as approved by the REQ EC on June 16, 2010 -
http://www.naesb.org/member_login_check.asp?doc=fa_req_2010_retail_api_9a.doc – Ratified July 30, 2010

2010 Retail Annual Plan Item No. 9.b (REQ Final Action) - Requirements Specifications for Common Scheduling Mechanism for Energy Transactions – for NIST PAP04 as approved by the REQ EC on June 16, 2010 -
http://www.naesb.org/member_login_check.asp?doc=fa_req_2010_retail_api_9b.doc – Ratified July 30, 2010

2010 Retail Annual Plan Item No. 9.c (REQ Final Action) - Requirements Specifications for Retail Standard DR Signals - for NIST PAP09 as approved by the REQ EC on June 16, 2010 -
http://www.naesb.org/member_login_check.asp?doc=fa_req_2010_retail_api_9c.doc – Ratified July 30, 2010

2009 Retail Annual Plan Item 1/R05016 – Develop Technical Electronic Implementation Standards and Data Dictionaries (*Book 9: Customer Billing and Payment Notification via Uniform Electronic Transaction*) – approved by the Retail ECs on February 3, 2010.

Final Action – Part A with Revised Attachments -

http://www.naesb.org/member_login_form.asp?doc=fa_retail_2009_api1_r05016.doc – Ratified August 30, 2010

Revised Attachment 1 – Data Dictionaries -

http://www.naesb.org/member_login_form.asp?doc=fa_retail_2009_api1_r05016_attach1.doc – Ratified August 30, 2010

Revised Attachment 2 – X12 Technical Implementation Guidelines -

http://www.naesb.org/member_login_form.asp?doc=fa_retail_2009_api1_r05016_attach2.rtf – Ratified August 30, 2010

2010 Retail Annual Plan Item 4 (Final Action) – Billing and Payments as approved by the Retail EC's on September 7, 2010 - http://www.naesb.org/member_login_form.asp?doc=fa_retail_2010_ap4.doc - Ratified November 8, 2010
Attachment: http://www.naesb.org/pdf4/retail_2009_ap_10a_10c_rec_attach.ppt (Models)

2009 Retail Annual Plan Items 10.a and 10.c (Final Action) – Service Request, Disconnection and Reconnection in the Registration Agent Model as approved by the Retail EC's on September 7, 2010 -

http://www.naesb.org/member_login_form.asp?doc=fa_retail_2009_ap_10a_10c.doc - Ratified November 8, 2010

Attachment: http://naesb.org/pdf4/retail_2010_ap4_rec_attachment.ppt (Models)

2010 Retail Annual Plan Item 9d (REQ Final Action) – Business Practices and Information Models to Support Priority Action Plan 10 – Standardized Energy Usage Information as approved by the REQ Executive Committee on October 22, 2010 - http://www.naesb.org/pdf4/req_2010_ap_9d_rec.doc - Ratified November 29, 2010



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NAESB UPDATE: VERSION 1.3 – RETAIL ELECTRIC AND RETAIL GAS QUADRANT (REQ/RGQ) DECEMBER 16, 2010

Retail 2010 Annual Plan Item 5a (Final Action) – Users Guide for Book 0 as approved by the Retail Executive Committees on October 27, 2010 - http://www.naesb.org/member_login_form.asp?doc=fa_retail_2010_ap_5a.doc – Ratified December 10, 2010

Retail 2010 Annual Plan Item 11 (Final Action) – Revised Master List of Defined Terms as approved by the Retail Executive Committees on October 27, 2010 - http://www.naesb.org/member_login_form.asp?doc=fa_retail_2010_ap_11.doc – Ratified December 10, 2010

Recommendations:

Retail 2010 Annual Plan Item 9 – Master Data Requirements List for Standards associated with NIST PAP03 and PAP09

Recommendation: http://www.naesb.org/pdf4/req_2010_ap9_rec_101510.doc

Request for Formal Comments - http://www.naesb.org/pdf4/req_101510_reqcom.doc - comment period ended November 15, 2010

Retail 2010 Annual Plan Item 9a – Phase 2: Requirements Specifications for Common Electricity Product and Pricing Definition for NIST PAP03

Recommendation Phase 2: http://www.naesb.org/pdf4/retail_2010_ap9a_rec_101510.doc

Request for Formal Comments - http://www.naesb.org/pdf4/req_101510_reqcom.doc - comment period ended November 15, 2010

Retail 2010 Annual Plan Item 9b – Phase 2: Requirements Specifications for Common Scheduling Mechanism for Energy Transactions for NIST PAP04

Recommendation Phase 2: http://www.naesb.org/pdf4/retail_2010_ap9b_rec_101510.doc

Request for Formal Comments - http://www.naesb.org/pdf4/req_101510_reqcom.doc - comment period ended November 15, 2010

Retail 2010 Annual Plan Item 9c – Phase 2: Requirements Specifications for Retail Standard DR Signals for NIST PAP09

Recommendation Phase 2: http://www.naesb.org/pdf4/retail_2010_ap_9c_rec_101510.doc

Request for Formal Comments - http://www.naesb.org/pdf4/req_101510_reqcom.doc - comment period ended November 15, 2010



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NAESB UPDATE: VERSION 1.3 – RETAIL ELECTRIC AND RETAIL GAS QUADRANT (REQ/RGQ) DECEMBER 16, 2010

Minor Corrections:

MC10035 – Minor Corrections to Internet Electronic Transport Related Standards, Submitted by T. Roza, GXS - http://www.naesb.org/pdf4/wgq_retail_mc10035_rec_102210.doc - approved by the Retail EC on October 27, 2010 and WGQ EC on October 28, 2010 (*Effective date December 17, 2010*)

MC09034 Correct references in 3 lines of Section 4.12 of the NAESB WGQ Standard No. 6.3.3 – Electronic Data Trading Partner Agreement (Version 1.8), Submitted by C. Burden, Williams Gas Pipeline - http://www.naesb.org/pdf4/wgq_retail_mc09034_rec_011510.doc – approved by the WGQ EC via notational ballot January 15, 2010. (*Effective date September 27, 2010*)

MC10025 – Version 1.9 (Errata) for NAESB WGQ Internet Electronic Transport (Internet ET) Manual and NAESB RXQ Internet ET Manual, Version 1.2, Submitted by C. Burden, Joint WGQ Information Requirements/Technical Subcommittee - http://www.naesb.org/pdf4/wgq_req_rgq_mc10025_rec_080610.doc - approved by the WGQ EC on August 6, 2010. (*Effective date September 27, 2010*)

MC10012 –Errata for NAESB WGQ Internet Electronic Transport (Internet ET) Manual, Version 1.9 and NAESB RXQ Internet ET Manual Version 1.2: http://www.naesb.org/pdf4/wgq_req_rgq_mc10012.doc - approved by the WGQ and Retail ECs on March 5, 2010. (*Effective Date June 24, 2010*)

TIMELINE:

- Version 1.3 is scheduled for publication in first quarter 2011.
- To back into this date – all standards should be ratified by date of publication, and EC actions should be taken one month prior, to publication, all subcommittee actions should be taken three months prior to publication.

Month - 4	Subcommittee Recommendations Completed and sent out for comment
Month - 3	EC Actions taken
Month - 2	Ratifications sent out and completes, minor corrections applied
Month - 1	Review of draft publication
Month - 0	Date of Publication.



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NAESB UPDATE: VERSION 1.4 – RETAIL ELECTRIC AND RETAIL GAS QUADRANT (REQ/RGQ) JANUARY 12, 2011

ACTIONS TO BE APPLIED TO RETAIL VERSION 1.3 TO CREATE RETAIL VERSION 1.4:

Version 1.3 will be published on March 31, 2011.

2011-12:

Final Actions:

Recommendations:

Retail 2010 Annual Plan Item 3c – Phase 2: M&V for Demand Response Programs

Recommendation Phase 2: http://www.naesb.org/pdf4/retail_2010_api_3c_rec_redline.doc (Redline),

http://www.naesb.org/pdf4/retail_2010_api_3c_rec_clean.doc (Clean)

Request for Formal Comments - http://www.naesb.org/pdf4/req_120810_reqcom.doc - *comment period ended January 14, 2011*

Comments Submitted by B. Sailors, Duke Energy: http://www.naesb.org/pdf4/req_120810_duke_energy.doc

Minor Corrections:

TIMELINE:

- Version 1.4 is scheduled for publication in 2012.
- To back into this date – all standards should be ratified by date of publication, and EC actions should be taken one month prior, to publication, all subcommittee actions should be taken three months prior to publication.

Month - 4	Subcommittee Recommendations Completed and sent out for comment
Month - 3	EC Actions taken
Month - 2	Ratifications sent out and completes, minor corrections applied
Month - 1	Review of draft publication
Month - 0	Date of Publication.



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January 14, 2010

TO: NAESB Board of Directors, Executive Committee (EC) Members, EC Alternates, and Invited Guests
FROM: Cory Galik Cummings, NAESB Staff Attorney
RE: Draft Minutes of the NAESB Board Meeting –December 9, 2010

**NAESB BOARD OF DIRECTORS MEETING
Marriott IAH Airport Hotel, Houston, Texas
Thursday, December 9, 2010 – 9:00 a.m. to 1:00 pm Central
DRAFT MINUTES**

1. Administration and Welcome

Ms. York welcomed the Board members and guests in the room and on the phone. Mr. Booe provided the antitrust guidance. Ms. Cummings called the roll of the NAESB Board members. Quorum was established.

2. Adoption of the Agenda and Minutes

Mr. True moved, seconded by Mr. Desselle, to approve the consent agenda. The motion passed unanimously.

3. Membership and Financial Report

Membership Report: Ms. McQuade reviewed the [membership report](#). This year NAESB experienced a net gain in membership, largely in response to the creation of the new WEQ segment, the reorganization of the retail quadrants and smart grid activities.

Financial Report: Ms. McQuade provided the [financial report](#). She noted that there will be a comparison between 2009 and 2010 financials at the next board meeting.

Financial Review Report: Ms. McQuade reviewed the [financial audit](#) performed by Dishongh, Jankowski & Eubank, PC. There were no issues found in the report.

Review, Discuss and Approve 2011 Budget: Ms. McQuade reviewed the [2011 budget](#), which is within 1 to 2% of the 2010 budget. NAESB expects to see an increase in revenue in 2011. Mr. Hurley moved, seconded by Mr. Young, to approve the 2011 budget. The motion unanimously passed a simple majority vote.

4. Reports from Board Committees

Resources: Mr. Brown provided the [report](#) of the Resources Committee. He noted the increase in membership due to NAESB's smart grid and demand response efforts. The Resource Committee remains committed to growing membership.

Critical Infrastructure Committee: Mr. Hurley provided an [update](#) of the activities of the Critical Infrastructure Committee. He provided a review of the November 16 Critical Infrastructure Committee, where there was discussion on the Lieberman Bill moving through Capital Hill, which is getting larger and more relevant as it becomes more bipartisan. The U.S. China Economic and Security Review Commission Report was released on November 17, which focused on the computer network exploitation and noted that Chinese military policy targets U.S. critical infrastructure in an event of a conflict. The report is available on the U.S. Commissions website. He also provided a review of STUXNET, which has proven to be the first example of a nation state created malware targeted to disrupt critical infrastructure.

Retail Restructuring Update: Ms. McKeever noted that the committee's review was complete in the Resource report.



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Managing Committee: Mr. Desselle provided an [update](#) of the Managing Committee, which met this morning in anticipation of this meeting. Since the last Board meeting the committee prepared via email a resolution with respect to notational ballots. A Parliamentary Committee meeting will be scheduled to review an issue that is applicable to all quadrants: how to manage the type of work NAESB may develop that does not rise to the level of standards. Mr. Cargas asked how the notational ballot resolution would be memorialized. Mr. Boswell answered that a one page document puts all existing procedures regarding notational ballots in one place in the hope that future confusion can be prevented by making that information easily accessible. It does not create new procedures, but rather consolidates the procedures that currently exist. Mr. Cargas moved that the Parliamentary Committee consider incorporating the text into the operating procedures and present it to the Board for adoption at the next meeting. Mr. Phillips seconded the motion. The motion unanimously passed a simple majority vote.

5. Updates on Specific Efforts

Publications: Ms. McQuade provided an update of the NAESB publication schedule. [WGQ Version 2.0](#) was published on November 30. She thanked Ms. Davis and Ms. Rager for their hard work on this effort. Ms. Davis noted that the publication included the clean up of all the capacity release data sets and added additional detail to communications between the pipelines and WEQ operators to make it notifications easily understandable. The [WEQ Version 2.2](#) will be published in mid-2011. In the meantime, NAESB will be filing the Demand Response, Energy Efficiency and Smart Grid standards to the Commission prior to the Version 2.2 publication. The [Retail Quadrants](#) will publish in the first quarter of 2011 and will contain Demand Response, Smart Grid and considerable changes to the Customer Choice standards.

WEQ, Update on FERC Order No. 890 efforts: Ms. York provided an update on the Order No. 890 efforts. The OASIS Subcommittee met a total of 8 times, including next week's scheduled 3-day meeting, since the last Board meeting for a total of 17 days in an effort to complete the Network Integrated Transmission Service (NITS) including all the technical standards. There are separate groups working on pieces of the standards offline in an effort to complete this project. A technical team from OATI is working with the subcommittee to complete the technical aspects of the standards and plan to deliver that work product during the meeting next week to be incorporated into WEQ standards 002 and 003. The team plans to incorporate other work products into WEQ 01 next week as well. There is another work group that is working on a concept for provisionally denied service which should be delivered in January. At that time, the subcommittee will determine whether to include it in the final product or whether it is a change of scope that was previously set. The NITS standards will be voted out of the subcommittee in January for a 30-day formal comment period. At that time, the team will focus its attention on completing the standards that will cover the Coordination of Transmission Service across Multiple Transmission Systems to be completed in first quarter of 2011.

WEQ/Retail Electric, Update on Demand Response and Demand Side Management: Mr. True provided an update of the DR and DSM activities. The Retail and Wholesale DR groups completed work to harmonize Glossary terms and complete phase 2 of the development. There are some slight differences, however, which relate to differences between the two industries. The recommendation was sent out for an informal comment period in July and one comment was received in support of the recommendation. The recommendation was voted out of the DSM-EE subcommittee on December 1, 2010 and will be sent out for formal comments this week. It is anticipated that this recommendation will be voted on by the REQ EC during the February EC meeting held in Phoenix, AZ.

Work continues on R10002, a request to develop the processes for enrolling Retail Customers in Demand Response programs. At the work group's last meeting, the participants felt that the WEQ Phase 2 PAP 09 Recommendation which lays out the WEQ Enrollment process in detail could be used to satisfy the request. However, the original requestor, James Tillett, had expectations that the PAP 09 recommendation would be more comprehensive. The retail DR work group will continue to meet to discuss this request.

The retail energy efficiency group continues to draft its recommendation. They currently have a draft glossary and several participants have begun to draft language for the model business practices, including sections on baseline estimates for measurement burnout vs. early retirement, energy efficiency programs, general evaluation plan



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requirements and select gross savings approaches. The next Retail EE call is scheduled for Friday, December 17 from 10-12 Central.

The wholesale demand response work group completed its phase 2 recommendation on Measurement and Verification of Demand Response products, which was sent out for informal comments were due October 29. Three sets of comments were received from The ISOs, Southern California Edison and EnerNOC. The wholesale DR work group reviewed the comments on November 5 and November 12, making several changes to the recommendation based on the comments received. The recommendation was voted out of the DSM-EE subcommittee on December 1, 2010. The recommendation will be sent out for formal comments this week, with comments due January 14, 2010. After the formal comments are received, the wholesale DR work group will meet to discuss the formal comments and prepare late comments for the WEQ ECs review. It is anticipated that the WEQ EC will vote on this recommendation during the February EC meeting in Phoenix, AZ. EnerNOC has stated, and will likely continue to state, that the standards fall short of what they believe was requested by ERC. The types of changes that EnerNOC would like to see would impact the design of the programs currently in place. The wholesale DR work group has stated that their understanding of the FERC Order was to provide as much granularity as possible. The work group stopped short of requiring the ISOs to modify their programs because they did not want to undermine the stakeholder process in place.

The wholesale energy efficiency group completed their recommendation on the Measurement and Verification of Energy Efficiency products. The wholesale energy efficiency recommendation was submitted for an informal comment period, which ended Monday, November 8. Comments were received from WPPI Energy, Westar Energy, EM&V Forum and the ISOs. The recommendation and comments were reviewed by the wholesale energy efficiency work group on Monday, November 15 and Thursday November 18 and several changes were made to the recommendation. The recommendation was voted out of the DSM-EE subcommittee meeting on December 1. It will be sent out for formal comments this week, with comments due January 14, 2010. It is anticipated that the WEQ EC will vote on this recommendation at the February EC meeting held in Phoenix, AZ.

RFP Status for the Electric Industry Registry: Ms. Cummings provided the update. On September 30, 2010, NAESB and OATI signed the contracting naming OATI as the Administrator of the Electric Industry Registry (EIR). The new Registry will provide a replacement to the existing NERC TSIN Registry. The Registry will be available to the industry in mid-2011 with training and parallel operations available prior to production release. These details will be made available to the industry well in advance of the release. OATI will provide the solution via the OATI webRegistry solution. Participation in the OATI webRegistry is intended for all electric entities with intentions of performing scheduling within North America. NAESB and OATI are currently finalizing a press release and a frequently asked questions document to provide more information to participants. NAESB and NERC worked collaboratively to select OATI. NAESB, NERC and OATI continue to work together collaboratively to ensure that product brought to market will meet the needs of the industry. It is hoped that OATI will complete a draft of the report that will serve as a "Frequently Asked Questions" shortly, after which a press release from all three organizations will be finalized.

Smart Grid Activities: Mr. Booe provided the update. The Smart Grid Standards Development Subcommittee addressing the requests from NIST related to Priority Action Plans 3, 4 and 9 completed its phase two effort on October 14 and voted out four wholesale recommendations and four retail recommendations for a formal comment period. The comment period for these recommendations ended on November 15, 2010. The subcommittee met on November 18, 2010 to review the comments and begin development of a set of late comments to be submitted to the WEQ and REQ Executive Committees. The subcommittee is scheduled to meet on December 9, 2010 to finalize this late set of comments. The WEQ EC and REQ EC will hold a single topic conference call to review the recommendation and comments followed by a single topic conference call to vote on all eight of the recommendations in 2011.

The subcommittee also has a conference call scheduled on December 10, 2010 with the OASIS Technical Committees leadership responsible for incorporating the NAESB phase two recommendations into the EMIX (PAP03), WS-Calendar (PAP04) and Energy Interoperation (PAP09) technical specifications. There have been concerns raised that the NAESB efforts may not be reflected in the work of other groups. This meeting is to ensure



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that the work of the NAESB subcommittee has been properly utilized as prescribed by the SGIP PAP process in the efforts underway by the OASIS Technical Committees. It is the responsibility of the SGIP Administrator to ensure that the work of one group is represented in the work other groups may undertake in extending the NAESB standards.

The Smart Grid Standards Subcommittee on Priority Action Plan 10 voted to post both the wholesale and retail Energy Usage Information Model recommendations for the 30 day formal comment period on August 31. After the formal comment period ended on September 30 the subcommittee met and developed a set of late comments for the WEQ and REQ ECs. The two ECs held a single topic review session on October 15 and a meeting to vote on the recommendations on October 22. During the meeting on October 22, the REQ EC voted to approve the REQ recommendation; however, the WEQ EC did not garner enough votes to make a determination on the WEQ recommendation. After a WEQ EC notational ballot period ending on October 29, the WEQ recommendation was approved and both the WEQ and REQ recommendations were submitted for ratification. On November 30, the recommendations were ratified, with no votes in opposition. On December 2 the SGIP PAP 10 working group adopted the NAESB final action and is currently in the process of closing the PAP 10.

As the NAESB Energy Usage Information Model proposes extensions to the IEC CIM model, there is the potential for additional work to be done as the IEC reviews and evaluates the NAESB standard and the CIM model and the SEP 2.0 model become more integrated. Currently differences between the two models are managed through extensions in the CIM model.

The Energy Services Provider Interface Task Force has continued to meet every two weeks to continue the development of a recommendation in response to REQ AP Item 9.e. The Task Force has a draft recommendation under development and is scheduled to have a complete draft by mid January 2011. This draft will then go out for an informal comment period in early February and should be finalized by the end of the 1st Quarter. The subcommittee continues to address an issue of including REST and/or Web Services technical implementations of the standard. This was an issue that was left unresolved in the development of the Open ADE specifications.

Update on Parallel Flow Visualization: Ms. York provided the update. The Business Practice Subcommittee began this project back in June, 2009 and has held several meetings to complete the final work product. In March of this year, both NAESB and NERC filed comments in conjunction with a FERC NOI related to transmission curtailment issues stating that each organization believed that the Parallel Flow Visualization project would help alleviate curtailment issues by improving the data that is sent to the Interchange Distribution Calculator and that a field test was scheduled to begin in November of this year to test the effectiveness of that new data feed. In July of this year, NERC, NAESB, and FERC discussed the importance of beginning the test in November and at that time, the BPS, in light of meeting those deadlines, developed an interim solution for the field test. The BPS would then continue to work on a final solution for the project. In October, the Executive Committee voted to approve the BPS recommendation and the standards were ratified by the WEQ membership as of today. NERC has begun the field test that is scheduled to run 12-18 months. Once the final PFV product is complete and approved on the NAESB side, it will be sent to NERC to become part of that field test. The BPS is continuing to work on the final product at this time. They have met 6 days in this quarter to work on permanent solution and have narrowed scope down to two options – one being flow gate allocation and the second a hybrid consisting of a “tag all non-firm” with generator prioritization methodology. The subcommittee is expecting to narrow these two options down to one during their February meeting and then begin to develop business practice standards for that option. Schedules call for that product to be voted out of Subcommittee for a 30-day formal comment period by end of 2nd quarter for 2011.

Update on Common Codes: Mr. Buccigross provided the review. The WEQ BPS began work on WGQ Annual Plan Item 7 addressing Common Location Codes in late November. The issue was brought forth to discuss the idea that the common location codes were potentially redundant, since this information is already being accurately provided through requirements to provide an entity’s proprietary code and fill out a lengthy location data field. Over the course of two meetings, the subcommittee discussed whether the common location codes currently in the NAESB standards added value. Although formal consensus has not been reached, the subcommittee is proceeding under the unopposed understanding that consensus may form in favor of eliminating the common location codes. To this end,



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several participants have agreed to meet as a task force to determine which standards in WGQ Version 2.0 should be modified to accomplish the removal. This task force will present its findings to the full subcommittee in early January, when it is expected that participants will determine a plan for modifications to support removal of the location common codes from NAESB standards and implementation guides. Discussion with FERC staff to explain the direction of the subcommittee, and ascertain FERC requirements and expectations regarding common codes will occur before any decisions are made.

6. Review, Discuss and Approve 2011 Annual Plans

2011 WGQ Annual Plan: Mr. Buccigross reviewed the [2011 WGQ Annual Plan](#). One minor modification was made to the plan. Mr. Desselle moved, seconded by Mr. Young, to approve the 2011 WGQ Annual Plan. The motion unanimously passed a simple majority vote.

2011 WEQ Annual Plan: Ms. York provided the review of the [2011 WEQ Annual Plan](#). Mr. True asked about the difference between item 1.b and provisional item 4. Mr. Desselle noted that footnote 3 explained the difference. After reviewing the two items, Ms. McQuade stated that she would address this item offline. She would contact PJM and Midwest ISO, as the footnote was specific to comments that were provided by them. She will see if they are comfortable with provisional item 4 being addressed in annual plan item 1.b, or if the footnote should be revised to better clarify the difference between the two items. Mr. True moved, seconded by Mr. Hurley to approve the 2011 WEQ Annual Plan. The motion unanimously passed a simple majority vote.

2011 Retail Annual Plan: Ms. McKeever provided the review of the [2011 Retail Annual Plan](#). Mr. Desselle moved, seconded by Mr. Cargas, to adopt the annual plan. The motion unanimously passed a simple majority vote.

7. Presentation on Data Privacy

[Ms. Zientara](#) and Mr. Hurley each provided a power point presentation on data access and privacy related to third parties. In Mr. Hurley's presentation he noted that the Smart Grid introduces several issues regarding data privacy and protection. Up to this point the data that operates the balancing of the bulk power system has largely been maintained by the energy providers. The Smart Grid introduces third parties, which introduces questions of reliability and integrity. The Smart Grid will also introduce very large amounts of data to store and maintain.

Ms. McQuade noted that one of the purposes of the Smart Grid was to introduce efficiency into the system. She asked how that was possible with petabytes of data. Mr. Hurley responded that the network cannot currently handle the level of traffic anticipated by Smart Grid applications.

Mr. Kruse asked what NAESB could do to increase awareness of these concerns in the industry. Ms. McQuade agreed NAESB should take steps to highlight these concerns and determine if there were other aspects that had not been taken into account that would address the increase in data traffic, need for data privacy and protection and that should be publicized.

Mr. Ellsworth asked if the jurisdictional issues were being addressed. Mr. Hurley noted that the federal government accelerated deployment by incentivizing investment in Smart Grid while standardization was underway. By deploying without a strong foundation of standards, there is a risk of a development of a patchwork of systems that might not be the compatible. It is a balancing act of speed of implementation in the market offset by some duplicative development and accompanying cost to bring about compatibility.

8. Old and New Business

Ms. McQuade stated that NAESB continues to have a good working relationship with FERC, NARUC and various state commissioners and remain in close communication.

Ms. McQuade noted that the [2011 Board of Directors meetings](#) would be held at the Houston Marriott North at Greenspoint. She also noted that a leadership seminar would be held February 24 and 25 in Las Vegas. More information on the seminar would be sent out shortly.



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9. Adjourn

The meeting adjourned at 12:10 pm Central.



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12. Board Attendance and Voting Record (Vacancies Omitted)

WGQ PRODUCERS SEGMENT		ATTENDANCE
Richard D. Smith	Regulatory & Compliance Manager, Noble Energy Inc.	
Mark Stultz	Vice President – Policy and Regulatory Affairs, US America Gas and Power, BP Energy Company	
Keith Sappenfield	Regional Director – US Regulatory Affairs, EnCana Oil & Gas (USA), Inc.	
Randy E. Parker	Global Regulatory Advisor, ExxonMobil Gas and Power Marketing Company	In Person
Pete Frost	Director – Regulatory Affairs, ConocoPhillips Gas and Power Marketing	In Person
WGQ PIPELINE SEGMENT		
Cathie Legge	Manager – Customer Service, Alliance Pipeline, LP	In Person
Bill Grygar	Vice President, Panhandle Eastern Pipe Line	In Person
Susanna B. Barry	Vice President – Commercial Operations, Tennessee Gas Pipeline Company	In Person
Randy Young	Vice President – Regulatory Compliance and Corporate Services, Boardwalk Pipeline Partners, LP	In Person
Richard Kruse	Senior Vice President, Spectra Energy Transmission	In Person
WGQ LOCAL DISTRIBUTION COMPANY (LDC) SEGMENT		
Craig Colombo	Energy Trader III, Dominion Resources	Phone
Adrian Chapman	Vice President – Regulatory Affairs & Energy Acquisition, Washington Gas	
Mike Novak	Asst. General Manager, National Fuel Gas Distribution Corporation	
WGQ END USERS SEGMENT		
Valerie Crockett	Senior Program Manager – Energy Markets & Policy, Tennessee Valley Authority	In Person
Timothy W. Gerrish	Director of Origination-Energy Marketing and Trading, Florida Power & Light	
Tina Burnett	Natural Gas Resources Administrator, The Boeing Company	In Person
Lori-Lynn C. Pennock	Senior Fuel Supply Analyst, Salt River Project	In Person
Jim Templeton	Principal, Comprehensive Energy Services	
WGQ SERVICES SEGMENT		
Darilyn Jones	Senior Vice President – Risk Control, Sequent Energy Management	Phone
Rusty Braziel	Managing Director, Bentek Energy, LLC	
Marty Patterson	Senior Vice President Commercial Services, American Midstream Partners, LP	
Paul Kahler	Midstream Regulatory Advisor, Cenovus Energy Inc.	
Lori Leeder	Relationship Manager/Business Development – Asset Optimization, Vega Energy Partners, Ltd	



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12. Board Attendance and Voting Record (Vacancies Omitted)

REQ SERVICE PROVIDERS/SUPPLIERS SEGMENT

Wendell Miyaji	Senior Director – Systems, Comverge, Inc.	In Person
Jim Minneman	Controller, PPL Solutions LLC	
J Cade Burks	Executive Vice President of ista	
Austin Morris	Managing Partner – Energy, SunGard Consulting Services, LLC	

REQ UTILITIES SEGMENT

David Koogler	Director – State Regulation, Dominion Virginia Power	In Person
Dennis Derricks	Director Regulatory Policy and Analysis, Wisconsin Public Service Corporation	
Ruth Kiselewich	Director – Demand Side Management Programs, Baltimore Gas & Electric Company	Phone
Debbie McKeever	Market Advocate, Oncor	In Person

REQ END USERS/PUBLIC AGENCIES SEGMENT

Kevin Cooney	Managing Director – Energy, Navigant Consulting, Inc.	Phone
James P. Cargas	Senior Assistant City Attorney, City of Houston	In Person

WEQ TRANSMISSION SEGMENT

SUBSEGMENT

Dan Klempel	Director Transmission Regulatory Compliance, Basin Electric Power Cooperative	Muni/Coop	
Chuck Feagans	Senior Manager, Reliability Policy, Tennessee Valley Authority	Fed/State/Prov	Phone
John E. Lucas	Director – Transmission Policy and Services, Southern Company Transmission	IOU	
Jill Horswell	Director Transmission, Southern California Edison	at large	Phone
Edward J. Davis	Policy Consultant, Entergy Services, Inc.	at large	In Person

WEQ GENERATION SEGMENT

Douglas L. Curry	Administrator and CEO, Lincoln Electric System	Muni/Coop	
Belinda Thornton	General Manager – Energy Origination, Tennessee Valley Authority	Fed/State/Prov	
Lou Oberski	Director – Electric Market Policy, Dominion Resources Services, Inc.	IOU	Phone
Wayne Moore	Regulatory Affairs & Energy Policy Director and Compliance Officer – Generation, Southern Company Services, Inc.	IOU	In Person
Brent Hodges	Director – Strategy and Development, NRG Energy, Inc.	at large	
Shah Hossain	Senior Regulatory Specialist, Westar Energy, Inc.	at large	In Person

WEQ MARKETERS/BROKERS SEGMENT

Roy True	Manager of Regulatory and Market Affairs, ACES Power Marketing	Muni/Coop	In Person
Jeff Ackerman	Manager – Colorado River Storage Project Energy Management and Marketing Office, Western Area	Fed/State/Prov	



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	Power Administration		
Gavin Cunningham	Manager – FirstEnergy Solutions Corp.	at large	Phone
Jack Cashin	Senior Manager of Policy, Electric Power Supply Association (EPSA)	at large	
Sam Forrest	Vice President – Energy Marketing and Trading, Florida Power & Light	IOU	
R. Scott Brown	Vice President and Director, Exelon Generation Power Team	IOU	In Person

WEQ DISTRIBUTION/LOAD SERVING ENTITIES (LSE) SEGMENT

Arthur G. Fusco	Vice President and General Counsel, Central Electric Power Cooperative Inc.	Muni/Coop	Phone
Paul McCurley	Manager – Power Supply, National Rural Electric Cooperative Association	Muni/Coop	
Nelson Peeler	Vice President System Operations, Duke Energy	IOU	In Person
Joe Hartsoe	Managing Director – Federal Policy, American Electric Power Service Corp.	at large	
Bruce Ellsworth	New York State Reliability Council	At-Large	In Person

WEQ END USERS SEGMENT

Jesse D. Hurley	Chief Executive Officer, Shift Research, LLC	at large	In Person
Aaron Breidenbaugh	Senior Manager – Regulatory Affairs and Public Policy – New York, EnerNOC, Inc.	at large	
Thomas G. Dvorsky	Director of the Office of Electricity, Gas, and Water at the New York State Department of Public Service, rep. National Association of Regulatory Utility Commissioners	Regulator	
Marie Pieniazek	Consultant, Rep: Energy Curtailment Specialists, Inc.	at large	
Rick Lentz	Fellow with SunGard	at large	In Person
Michehl Gent	Open Access Technology International, Inc.	At-Large	In Person

WEQ INDEPENDENT GRID OPERATORS/PLANNERS

Michael Desselle	Vice President Process Integrity, Southwest Power Pool		In Person
Kent Saathoff	Vice President of System Operations, ERCOT		
Kevin Kirby	Vice President Market Operations, ISO New England, Inc.		Phone
Rana Mukerji	Vice President Market Structures, New York Independent System Operator, Inc. (NYISO)		
Andy Ott	Senior Vice President Marketing, PJM Interconnection, LLC		
Bill Phillips	Vice President Standards Compliance & Strategy, Midwest ISO (MISO)		In Person
Peter Sergejewich	Director of Corporate Planning, Independent Electricity System Operator (IESO)		



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12. Board Attendance and Voting Record (Vacancies Omitted)

WEQ TECHNOLOGY AND SERVICES

Jim Buccigross	Vice President Energy Industry Practice, 8760 Inc.	Phone
Laurent M. Liscia	Executive Director, Organization for the Advancement of Structured Information Standards (OASIS)	
David A. Wollman	Leader, Smart Grid Team – Standards and Electrical Metrology Groups, National Institute of Standards and Technology (NIST)	
Dr. Scott Coe	Vice President, Utility Integration Solutions, Inc. (UISOL)	In Person

RGQ SERVICE PROVIDERS/SUPPLIERS SEGMENT

Leigh Spangler	President, Latitude Technologies Inc.	In Person
Rick Vogel	Vice President – Sales and Natural Gas Operations, Sierra Southwest Cooperative Services, Inc.	
Dave Darnell	President & CEO, Systrends USA	
Greg Lander	President, Capacity Center	

RGQ DISTRIBUTORS SEGMENT

Alonzo Weaver	Vice President of Engineering and Operations, Memphis Light, Gas & Water Division (APGA)	
Ralph Cleveland	Senior Vice President – Engineering and Operations, AGL Resources, Inc.	

RGQ END USERS/PUBLIC AGENCIES SEGMENT



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13. Other Attendance

Name	Organization	Attendance
Jonathan Booe	NAESB	In Person
Bill Boswell	NAESB	In Person
Kathryn Burch	Spectra Energy Transmission	In Person
Christopher Burden	Williams Gas Pipeline	Phone
James Culliton	NAESB	Phone
Cory Cummings	NAESB	In Person
Dale Davis	Williams Gas Pipeline	In Person
Rufus Gladney	Consumers Energy Company	In Person
Mark Gracey	El Paso Gas Pipeline Company	In Person
Bill Griffith	El Paso Natural Gas	In Person
Susan Munson	ERCOT	In Person
Rae McQuade	NAESB	In Person
Alan Pritchard	Duke Energy	Phone
Denise Rager	NAESB	In Person
Andy Rodriguez	NERC	In Person
Lisa Simpkins	Constellation Energy Resources	Phone
Ed Skiba	Midwest ISO	In Person
Veronica Thomason	NAESB	In Person
Kim Van Pelt	Panhandle Eastern Pipeline	In Person
Jill Vaughn	Preferred Legal Services	In Person
Charles Yeung	SPP	In Person
Kathy York	Tennessee Valley Authority	In Person
Mary Zientara	Reliant Energy	In Person



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NORTH AMERICAN ENERGY STANDARDS BOARD
2011 Annual Plan for the Wholesale Gas Quadrant Executive Committee
As Approved by the Board of Directors on December 9, 2010

Item Description	Completion ¹	Assignment ²
1. Reorganize Standards Manuals for Ease of Use³		
a. Develop a separate WGQ manual specifically for Informational Postings standards or, alternatively, add the Informational Postings standards to the Additional Standards manual to provide ease in implementation. (Reorganize Standards Request) Status: Not Started	3 rd Q, 2011	IR/Technical
b. Continue reordering of standards by topic and as future standards are added, standards continue to be ordered in topic format. Status: Not Started	2012	IR/Technical
2. Sample Paper Review³		
a. Plan for the Review and Update Sample Papers and ASX X12 Samples for all data sets with the exception of the Offer – Standard No. 5.4.z1, Bid - Standard No. 5.4.z2, Award Download - Standard No. 5.4.z3 and the Operational Capacity - Standard No. 0.4.z1 and Unsubscribed Capacity - Standard No. 0.4.z2 data sets in Capacity Release to ensure consistency with the related data dictionaries. (Sample Paper Review Request) Status: Not Started	1 st Q, 2011	IR/Technical
b. Execute Plan to Review and Update Sample Papers and ASX X12 Samples for all data sets with the exception of the Offer – Standard No. 5.4.z1, Bid - Standard No. 5.4.z2, Award Download - Standard No. 5.4.z3 and the Operational Capacity - Standard No. 0.4.z1 and Unsubscribed Capacity - Standard No. 0.4.z2 data sets in Capacity Release to ensure consistency with the related data dictionaries. Status: Not Started	Dependent on 2a	IR/Technical
3. Development of EBB Code Values³		
a. Plan for the review of code values and code value descriptions in all data sets to make them easier to understand on the TSPs' EBB web sites. (EBB Code Request) Status: Not Started	2 nd Q, 2011	IR/Technical
b. Execute the plan for the review code values and code value descriptions in all data sets to make them easier to understand on the TSPs' EBB web sites. Status: Not Started	Dependent on 3a	IR/Technical
4. Development of Error Code Standards³		
a. Plan for the development of meaningful error code values in all data sets to make them easier to understand on the TSPs' EBB web sites as compared to the X12 DISA error codes. (Error Code Request) Status: Not Started	3 rd Q, 2011	IR/Technical
b. Execute the plan for the development of meaningful error code values in all data sets to make them easier to understand on the TSPs' EBB web sites as compared to the X12 DISA error codes. Status: Not Started	Dependent on 4a	IR/Technical



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Item Description	Completion ¹	Assignment ²
5. Electronic Delivery Mechanisms		
Review minimum technical characteristics in Appendices B, C, and D of the WGQ QEDM Manual, and make changes as appropriate. Status: Not Started	3 rd Q, 2011	EDM
6. NAESB Base Contract Review and Update		
Review typical industry Special Provisions to the NAESB Base Contract for consideration to be integrated into the NAESB Base Contract. Review is to include corresponding updates to other related documents (e.g. Canadian Addendum, ISDA Amendment and Model Credit Support Addendum and Frequently Asked Questions)		
a. NAESB Base Contract review and update Status: Pending start February 2011	3 rd Q, 2011	Contracts Subcommittee
b. Canadian Addendum, ISDA Amendment, Model Credit Support Addendum and Frequently Ask Questions review and update Status: Pending start April 2011	3 rd Q, 2011	Contract Subcommittee
7. Common Codes		
a. Determine if location common codes as formulated are needed. Status: Underway	1st Q, 2011	BPS
b. If location common codes are needed, then determine if existing specifications are sufficient, or conversely, if not needed, develop plan for modifications to support removal of location common code from NAESB WGQ standards. Status: Not Started	Date dependent on annual plan item 7a	BPS

Program of Standards Maintenance & Fully Staffed Standards Work

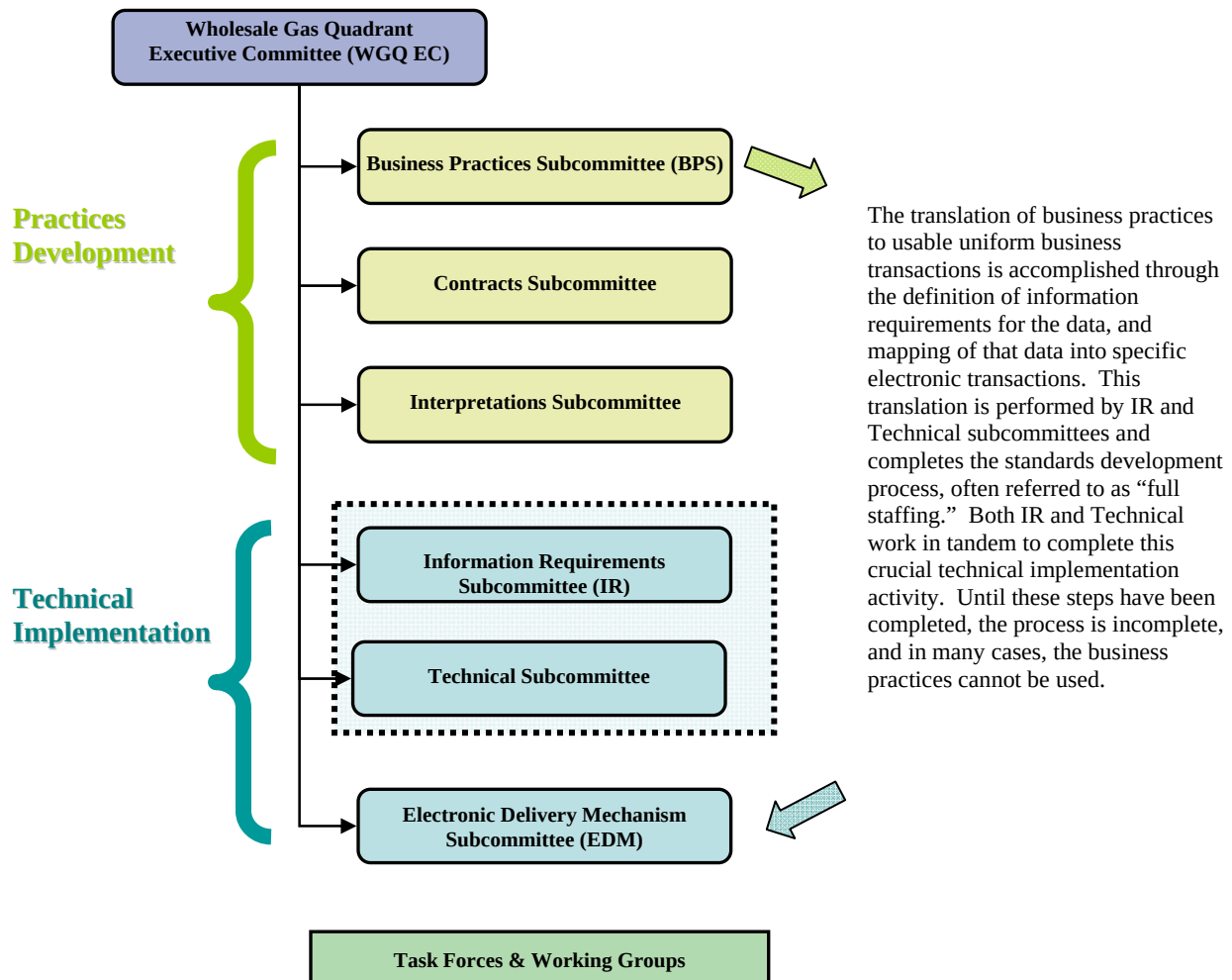
Business Practice Requests	Ongoing	Assigned by the EC ⁴
Continue review against plan for migration to ANSI ASC X12 new versions as needed and coordinate such activities with DISA.	Ongoing	ANSI X12 Subcommittee
Information Requirements and Technical Mapping of Business Practices	Ongoing	Assigned by the EC ³
Interpretations for Clarifying Language Ambiguities	Ongoing	Assigned by the EC ³
Maintenance of Code Values and Other Technical Matters	Ongoing	Assigned by the EC ³
Maintenance of eTariff Standards	As Requested	Assigned by the EC ³

Provisional Activities

1. Review and develop standards as needed related to [Docket No. RM11-1-000](#), Capacity Transfers on Intrastate Natural Gas Pipelines (Notice of Inquiry issued on October 21, 2010).

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NAESB 2011 WGQ EC and Subcommittee Leadership:

Executive Committee: Jim Buccigross, Chair and Dale Davis, Vice-Chair
Business Practices Subcommittee: Kim Van Pelt, Lori Lynn Pennock, Mike Novak and Richard Smith
Information Requirements Subcommittee: Dale Davis
Technical Subcommittee: Mike Stender, Kim Van Pelt
Contracts Subcommittee: Keith Sappenfield
Electronic Delivery Mechanism Subcommittee: Leigh Spangler, Christopher Burden
Interpretations Subcommittee: Paul Love



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End Notes, WGQ 2011 Annual Plan:

¹ Dates in the completion column are by end of the quarter for completion by the assigned committee. The dates do not necessarily mean that the standards are fully staffed to be implementable by the industry, and/or ratified by membership. If one item is completed earlier than planned, another item can begin earlier and possibly complete earlier than planned. There are no begin dates on the plan.

² The assignments are abbreviated. The abbreviations and committee structure can be found at the end of the annual plan document.

^{3 3} As business issues are presented to the Information Requirements Subcommittee and Technical Subcommittee, those business issues will be given precedence over WGQ 2011 Annual Plan Item Nos. 1, 2, 3 and 4.

⁴ The EC assigns maintenance of existing standards on a request-by-request basis.



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NORTH AMERICAN ENERGY STANDARDS BOARD
2011 ANNUAL PLAN for the WHOLESALE ELECTRIC QUADRANT
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Item Description	Completion ¹	Assignment ²
1 Develop business practices standards as needed to complement reliability standards		
Develop business practice standards to support and complement NERC reliability standards, NERC policies and NERC standards authorization requests (SARs) using the NERC/NAESB Coordination Joint Standards Development Process as appropriate. Current NAESB activities underway to develop business practice standards that are supportive of this annual plan item are:		
a) Parallel Flow Visualization/Mitigation for Reliability Coordinators in the Eastern Interconnection – Permanent Solution	2 nd Q, 2011	BPS
Note: Consideration should be given to provisional item 4. Work is being coordinated with the NERC IDC Working Group.		
Status: Started		
b) Perform consistency review of WEQ-008 Transmission Loading Relief Business Practice Standards and develop recommendation. ¹	4 th Q, 2011	BPS
c) DCS and AGC (BAL-002 and BAL-005) Coordination with NERC	TBD ²	TIMTF
Status: Monitor. (Will require coordination with Balancing Authority Reliability Based Controls Group created in July 2010 NERC Project 2010-14)		
d) Coordinate with NERC on the functional model glossary revisions NERC Project 2010-08	TBD	SRS
e) Coordinate with NERC on changes to the definition of Bulk Electric System NERC Project 2010-17	TBD	SRS
2 Develop business practice standards in support of the FERC RM05-25-000 and RM05-17-000 (OATT Reform)²		
a) Develop version 2 business practice standards to better coordinate the use of the transmission system among neighboring transmission providers.		
Status: Underway		
Request R050004 was expanded to include the Order No. 890 (Docket Nos. RM05-17-000 and RM02-25-000) , (Order No. 890-A (Docket Nos. RM05-17-001, 002 and RM05-25-001, 002)), and Order No. 890-B (Docket Nos. RM05-17-03 and RM05-25-03) “Preventing Undue Discrimination and Preference in Transmission Services”		
i) Group 3: Network Service On OASIS ³		
1) Use of OASIS to Make Electronic Requests to Designate and Terminate Network Resource	1 st Q, 2011	OASIS
Status: Underway		

¹ In some sections of WEQ 008 it appears that the standards are applicable to all of the Interconnections and other it appears that the standards are only applicable to the Eastern Interconnection. The title indicates the standards are applicable to the Eastern Interconnection.

² FERC Order No. 890, issued February 16, 2007 can be accessed from the following link - http://www.naesb.org/doc_view4.asp?doc=ferc021607.doc

³ Several group 3 items may be removed from this plan if the 4th quarter completion dates are met.



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Item Description		Completion ¹	Assignment ²
2)	Ability to Query Requests to Designate and Terminate Network Resources and Allow for Queries of All Information Provided with Designation Requests Status: Underway	1 st Q, 2011	OASIS
3)	Masking of Designated Network Resource Operating Restrictions and Generating Cost Information Status: Underway	1 st Q, 2011	OASIS
4)	Procedural Requirements for Submitting Designations over new OASIS Functionality Status: Underway	1 st Q, 2011	OASIS
5)	Specify How Designated Network Service Informational Postings are Posted on OASIS Status: Underway	1 st Q, 2011	OASIS
6)	Develop standards for the treatment of OASIS Requests when the Customer Fails to Provide the Necessary Attestation Status: Underway	1 st Q, 2011	OASIS
7)	Procedural Requirements for Submitting Both Temporary and Indefinite Terminations of Network Resources Status: Underway	1 st Q, 2011	OASIS
8)	Procedures for Submitting and Processing Requests for Concomitant Evaluations of Transmission Requests and Temporary Terminations Status: Underway	1 st Q, 2011	OASIS
ii)	Group 4: Pre-Emption; Request No. R05019		
1)	Pre-Emption Status: Not Started	3 rd Q, 2011	OASIS
2)	Request No. R05019 Status: Not Started	3 rd Q, 2011	OASIS



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	Item Description	Completion ¹	Assignment ²
iii)	Group 5: Paragraph 1377 ⁴ – Group 5 work should precede group 4 work ³		
	1) Paragraph 1377-Coordination of Requests Across Multiple Transmission Systems Status: Underway, Scoping Group work product approved by the WEQ EC and sent to the OASIS Subcommittee.	1 st Q, 2011	OASIS
	2) Re-Bid Of Partial Service across Multiple Transmission Providers' Systems Status: Underway, Scoping Group work product approved by the WEQ EC and sent to the OASIS Subcommittee	1 st Q, 2011	OASIS
	3) Group DNR requests from a system with point-to-point requests on other systems for synchronization Status: Underway, Scoping Group work product approved by the WEQ EC and sent to the OASIS Subcommittee	1 st Q, 2011	OASIS

⁴ Paragraph 1377 of FERC Order No. 890, issued February 16, 2007: The Commission agrees that transmission requests across multiple transmission systems should be coordinated by the relevant transmission providers. We will not, however, amend the pro forma OATT to require such coordination. Rather, we require transmission providers working through NAESB to develop business practice standards related to coordination of requests across multiple transmission systems. In order to provide guidance to NAESB, we will articulate the principles that should govern processing across multiple systems. All the transmission providers involved in a request across multiple systems should consider a request that requires studies across multiple systems to be a single application for purposes of establishing the deadlines for rendering an agreement for service, revising queue status, eliciting deposits and commencing service. In order to preserve the rights of other transmission customers with studies in the queue, the priority for the single application should be based on the latest priority across the transmission providers involved in the multiple system request. We note that regional entities like wesTTrans are already coordinating requests across multiple transmission systems and we believe such coordination is an acceptable solution to this issue.



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	Item Description	Completion ¹	Assignment ²
iv)	Group 6: Miscellaneous (Paragraphs 1390 ⁵ and 1627 ⁶ of FERC Order No. 890)		
	1) Paragraph 1390 of Order 890 – Terminations related to: deficient requests, customer failure to pay required annual reservation fee, and customer modifications to applications which are meaningfully different. Status: Not Started	4 th Q, 2011	OASIS
	2) Paragraphs 1627 of Order 890 – Posting of additional information on OASIS regarding firm transmission curtailments Status: Not Started	4 th Q, 2011	OASIS
	3) Redispatch Cost Posting to allow for posting of third party offers of planning redispatch services. Status: Not Started	4 th Q, 2011	OASIS

⁵ Paragraph 1390 of FERC Order No. 890, issued February 16, 2007: We will not modify the pro forma OATT to address requests to allow the transmission provider to terminate idle transmission service requests. NAESB's business practice 001-4.11 allows the transmission provider to retract a request if the transmission customer does not respond to an acceptance within the time established in NAESB business practice standard 001-4.13. Therefore, we interpret TDU Systems comments to refer to circumstances when a transmission customer fails to respond to the transmission provider's request for additional information during the course of a request study. As discussed above, by the time the transmission provider offers a system impact study agreement, it should have all of the information that it needs to complete the study. Pursuant to section 17.4 of the pro forma OATT, the transmission provider can deem a transmission service request deficient if the transmission customer does not provide all of the information the transmission provider needs to evaluate the request for service. We will revise section 17.7 of the pro forma OATT so that the transmission provider is able to terminate a request for transmission service if a transmission customer that is extending the commencement of service does not pay the required annual reservation fee within 15 days of notifying the transmission provider that it would like to extend the commencement of service. We will not change the pro forma OATT to allow the transmission provider to terminate a transmission service request if the transmission customer changes its application for service. We believe the existing pro forma OATT is sufficient to allow a transmission provider to manage situations where the transmission customer modifies its application for service to the point that the customer is requesting transmission service that is meaningfully different than its initial request.

⁶ Paragraph 1627 of FERC Order No. 890, issued February 16, 2007: We agree with suggestions for the posting of additional curtailment information on OASIS and, therefore, require transmission providers, working through NAESB, to develop a detailed template for the posting of additional information on OASIS regarding firm transmission curtailments. Transmission providers need not implement this new OASIS functionality and any related business practices until NAESB develops appropriate standards. These postings must include all circumstances and events contributing to the need for a firm service curtailment, specific services and customers curtailed (including the transmission provider's own retail loads), and the duration of the curtailment. This information is in addition to the Commission's existing requirements: (1) when any transmission is curtailed or interrupted, the transmission provider must post notice of the curtailment or interruption on OASIS, and the transmission provider must state on OASIS the reason why the transaction could not be continued or completed; (2) information to support any such curtailment or interruption, including the operating status of facilities involved in the constraint or interruption, must be maintained for three years and made available upon request to the curtailed or interrupted customer, the Commission's Staff, and any other person who requests it; and, (3) any offer to adjust the operation of the transmission provider's system to restore a curtailed or interrupted transaction must be posted and made available to all curtailed and interrupted transmission customers at the same time.



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Item Description	Completion ¹	Assignment ²
b) Develop the needed business practices to support existing Request No. R05004: The processing of transmission service requests, which use TTC/ATC/AFC, in coordination with NERC changes to MOD 001 where the allocation of flowgate capability based on historical Network Native Load impacts the evaluation of transmission service requests, requiring the posting of those allocation values in conjunction with queries of service offerings on OASIS Status: Underway	1 st Q, 2011	OASIS
3 Develop business practices standards to improve the current operation of the wholesale electric market and develop and maintain business practice and communication standards for OASIS and Electronic Scheduling		
a) Develop and/or maintain business practice standards as needed for OASIS and electronic scheduling. Specific items to address include:		
i) Network Services: Determine and develop needed business practice standards or other support is needed to support use of OASIS for Network Service transactions (R04006E). (Related to AP 2(a)(iii))³ – to discuss at the WEQ EC meeting on whether this item can be closed out. Status: Underway	1 st Q, 2011	OASIS
ii) Registry (TSIN): Determine and develop needed business practice standards to support the registry functions currently supported by NERC (R04037, R06027) and transition the TSIN Registry from NERC to NAESB as the enhanced Electric Industry Registry (EIR). Status: Underway.	2 nd Q, 2011	NAESB/NERC Administration, JESS
iii) Make remaining incremental enhancements to OASIS as an outgrowth of the NAESB March 29, 2005 conference on the future of OASIS (R05026).		
Scoping statement completed by SRS. There were a number of assignments from the Standards Request. The outstanding items are included below:		
1) Eliminate Masking of TSR tag source and sink when requested status is denied, withdrawn refused, displaced, invalid, declined, annulled or retracted Status: Not Started	2012	OASIS
2) Initiate standard that eliminates the disparity of posting “sensitive” information. This standard should also include procedures of user certification that allows access to this class of information. Status: Underway (upon further development of this item by NAESB, a completion date will be determined)	2012	OASIS
3) Enhance the TSR result postings to allow showing of (i) limiting transmission elements and (ii) available generation dispatch options that would allow acceptance of reservation request. Status: Not Started (upon initiation of this item by NAESB, a completion date will be determined)	2012	OASIS



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	Item Description	Completion ¹	Assignment ²
iv)	Review and correct WEQ-004 Coordinate Interchange Business Practice Standard as needed based on activities in NERC Project 2008-12, Coordinate Interchange Standards Revisions and supporting EOP-002-2 R4 and R6. Status: Underway Completion date dependent upon coordination activities with NERC	2011	JESS
b)	Develop and/or maintain standard communication protocols and cyber-security business practices as needed.		
i)	Develop PKI certification program for e-Tag and OASIS Status: Underway	3 rd Q, 2011	Board Certification Program Committee
ii)	Develop PKI standards for OASIS. Status: Not Started (upon initiation of this item by NAESB, a completion date will be determined)	2012	OASIS
iii)	Develop Industry Implementation Plan for meeting PKI Standard requirements for e-tagging. Status: Underway. Full e-Tag implementation (server & client side) is linked to the transition of the Registry from NERC to NAESB and NAESB implementation.	TBD – dependent on item above (i) and EIR	JESS
4	Review and develop business practices standards to Demand Response, Demand Side Management and Energy Efficiency Programs		
	Review and develop needed model business practices for a standardized method for quantifying benefits, savings, cost avoidance and/or the reduction in energy demand and usage derived from the implementation of demand side management and energy efficiency programs. This effort will include demand side response, energy efficiency programs and metering, including the 'curtailment service provider' program.		
a)	Review the NAESB Business Practices for Measurement and Verification of Wholesale Electricity Demand Response (WEQ-015) in conjunction with the IRC developed Demand Response Matrix and identify business practice requirements that could be improved or made clearer through the addition of specific technical detail. The wholesale and retail demand response work groups and the Smart Grid Standards Subcommittees should actively and timely communicate and coordinate work products to ensure consistency between the three work groups. Each work group should take into account the work products developed by the other. Status: Completed	Phase 2 – 4 th Q 2010	WEQ Section of the Joint WEQ/REQ DSM-EE Subcommittee
b)	For each performance evaluation type/service type combination identified in WEQ-015, using the IRC matrix as a starting point, assess and determine what standards or guidelines, if any, should be developed to aid all participants in the use of measurement and verification methods for demand response programs in organized wholesale electric markets. If the determination is made that standards or guidelines will be developed, those items will be added as sub-items to 4(b). Status: Completed	Phase 2 – 4 th Q 2010	WEQ Section of the Joint WEQ/REQ DSM-EE Subcommittee



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Item Description	Completion ¹	Assignment ²
c) Coordinate glossary updates for business practice standards with the Retail Electric Quadrant Status: Ongoing	Ongoing	Joint WEQ/REQ DSM Subcommittee and WEQ SRS and Retail Glossary
d) Develop business practice standards used to measure and verify reductions in energy and demand from energy efficiency in wholesale and retail markets. ³ This includes developing business practice standards to measure and verify energy reductions that are made to comply with a Renewable Portfolio Standard that included energy efficiency or a stand-alone Energy Efficiency Portfolio Standard Status: The WEQ EE standards are completed.	4 th Q, 2010	Joint WEQ/REQ DSM-EE Subcommittee
5 Maintain existing body of Version 2.x standards		
a) Make consistency changes to Version 2.2 standards as directed by the WEQ Leadership Committee on December 12, 2007 OASIS Consistency Changes (R08001, R08002, R08003, R08005) Status: Not Started (upon initiation of this item by NAESB, a completion date will be determined)	TBD	OASIS
b) Consistent with ¶51 of FERC Order No. 890-A, add AFC and TFC values to the "System_Attribute" data element of the NAESB Standard WEQ-003: OASIS S&CP Data Dictionaries. (R08011) Status: Not Started. This Standards Request was assigned to the OASIS in May 2008.	TBD	OASIS
c) Correct WEQ 013-2.6.7.2. – Resale off OASIS (R08027) Status: Not Started	TBD	OASIS
d) Add language to WEQ-001-4 Online Negotiation and Confirmation process to clarify Table 4-3 (R09003) Status: Not Started	TBD	OASIS
e) Create a new OASIS mechanism that allows for the merger of like reservations without the use of the resale mechanism (R09015) Status: Not Started	TBD	OASIS
6. Develop Smart Grid Wholesale and Retail Electric Standards - The wholesale and retail demand response work groups and the Smart Grid task force should actively and timely communicate and coordinate work products to ensure consistency between the three work groups. Each work group should take into account the work products developed by the other.		
a) Develop requirements and use cases for PAP 03 – Pricing Model Phase 2 Status: Completed	4 th Q, 2010	Joint WEQ/REQ SGS Subcommittee
b) Develop requirements and use cases for PAP 04 – Scheduling Model Phase 2 Status: Completed	4 th Q, 2010	Joint WEQ/REQ SGS Subcommittee



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Item Description		Completion ¹	Assignment ²
c)	Develop requirements and use cases for PAP 09 – Demand Response/Distributed Energy Resources Phase 2 Status: Completed	4 th Q. 2010	WEQ Section of the Joint WEQ/REQ SGS Subcommittee
d)	Develop standards to support PAP 10 – Standards Energy Usage Information		
i)	Develop Information Model and related business practices Status: Complete	4 th Q. 2010	Joint WEQ/REQ PAP 10 SGS Subcommittee
ii)	Develop standards to support PAP 10 – Standards Energy Usage Information, Phase 2, Harmonization with CIM and SEP 2.0 Status: Not Started, pending discussions with CIM and SEP 2.0	2011	Joint WEQ/REQ PAP 10 SGS Subcommittee
7. Develop or modify standards to Support FERC Order No. 676-E, (Docket No. RM 05-5-013)			
a)	Review standards 001-14.1.3 and 001-15.1.2 based on FERC Order No. 676-E (See ¶ 39 ⁷) Status: Not Started	2 nd Q. 2011	OASIS
b)	Develop standards to support the Transmission Provider right to reassess the availability of conditional firm (See ¶ 72 ⁸) Status: Not Started	2 nd Q. 2011	OASIS
c)	Prepare status reports every six months regarding the development of standards for the coordination of transmission service requests across multiple transmission systems (See ¶ 105 ⁹). This annual plan item is tied to Annual Plan Item 2(a)(iii) Status: Underway – first report filed.	Ongoing	NAESB Office

⁷ 39. In regards to Entergy's question of whether the transmission provider's calculated and posted available flowgate capability values should be used to fulfill the posting requirements set forth in Standard 001-14 and 001-15 in instances where there is no requirement to convert this calculation to available transfer capability values, we agree with Entergy that this requirement can be met by the transmission provider posting its available flowgate capability values. As to EPSA's argument that Standard 001-15 falls short of the goals of Order No. 890, we find that, with the exception of Standard 001-15.1.2, compliance with Standard 001-15 provides all of the information required by Order No. 890. However, Standards 001-14.1.3 and 001-15.1.2 permit transmission providers to post an available transfer capability change narrative within five business days of meeting the criteria under which a narrative is required to be posted. In Order No. 890, the Commission rejected calls for delays prior to posting data and required posting as soon as possible. We do not find the NAESB standard meets this criterion and therefore decline to incorporate Standards 001-14.1.3 and 001-15.1.2 by reference. Transmission providers must post their narratives as soon as feasibly possible. Posting within one day would appear in most cases to be reasonable.

⁸ 72. However, we reiterate here the Commission's finding in Order No. 890 that a transmission provider is permitted to extend its right to reassess the availability of conditional firm service. Since the Version 002.1 Standards do not specifically address this issue, we would ask the industry, working through NAESB, to continue to look at additional business practice standards facilitating a transmission provider's extension of its right to perform a reassessment

⁹ 105. We agree that insufficient progress has been made on this issue. While we acknowledge that development of standards addressing this issue is included in NAESB's 2009 WEQ Annual Plan, we nevertheless urge NAESB to address this issue as



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soon as possible. Accordingly, we request that NAESB provide the Commission with a status report concerning its progress on this issue every six months, counting from the date this final rule is published in the Federal Register, until NAESB's adoption of the applicable standard(s).



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PROVISIONAL ITEMS

- 1 Develop and or modify business practices related to support of NERC effort on the NERC Resources and Transmission Adequacy (Project 2009-05 Resource Adequacy Assessment).
- 2 Develop business practices for allocating capacity among requests received during a submittal window Order 890-A ([Docket Nos. RM05-17-001, 002 and RM05-25-001, 002](#) - Paragraph 805)¹⁰.
- 3 Determine any needed NAESB action in support of the Interchange Distribution Calculator (IDC) and develop any necessary standards.
- 4 Prepare recommendations for future path for TLR¹¹ (Phase 2) in concert with NERC, which may include alternative congestion management procedures⁴. Work on this activity is dependent on completing 2010 WEQ Annual Plan 1.a (Parallel Flow Visualization/Mitigation for Reliability Coordinators in the Eastern Interconnection - Phase 1).
- 5 Develop complementary standards that align with NERC Project 2008-01 Voltage and Reactive Control, for which a white paper is expected after the SAR is authorized to proceed by the NERC Standards Committee.
- 6 Determine NAESB action needed to support FERC Action Plan for Smart Grid Technology.
- 7 Develop business practice standards for cap and trade programs for green house gas
- 8 Conduct assessment to determine if Electric Industry Requirements documented in WEQ-011 Gas / Electric Coordination should be considered reliability requirements and transition to NERC.
- 9 Develop needed business practice standards for organization/company codes for NAESB standards – and address current issues on the use of DUNs numbers. Common code usage is linked to the transition of the Registry from NERC to NAESB.
- 10 Review the need for, and develop standards where appropriate, in response to issues raised by FERC's National Action Plan on Demand Response.
- 11 Develop, modify or delete business practices to support Time Error and Inadvertent (BAL-004 and BAL-006) resulting from the NERC field test under NERC project (NERC Project 2010-14).
12. Coordinate standards development with the NERC Balancing Authority Reliability Based Controls Standards Drafting Team (BARCSDT- created in July 2010) regarding DCS and AGC (BAL-002 and BAL-005) which may require changes to NAESB WEQ standards.

¹⁰ 805. The Commission recognizes that developing methods to allocate capacity among requests received during a submittal window may require detailed procedures, particularly when transmission requests received simultaneously exceed available capacity. As the Commission explained in Order No. 890, however, we believe that each transmission provider is in the best position to develop allocation procedures that are suitable for its system. This does not preclude transmission providers from working through NAESB to develop standardized practices, as suggested by Southern. For example, as we pointed out in Order No. 890, allocation methods such as that used by PJM to allocate monthly firm point-to-point transmission service could provide useful guidance in developing general allocation procedures.

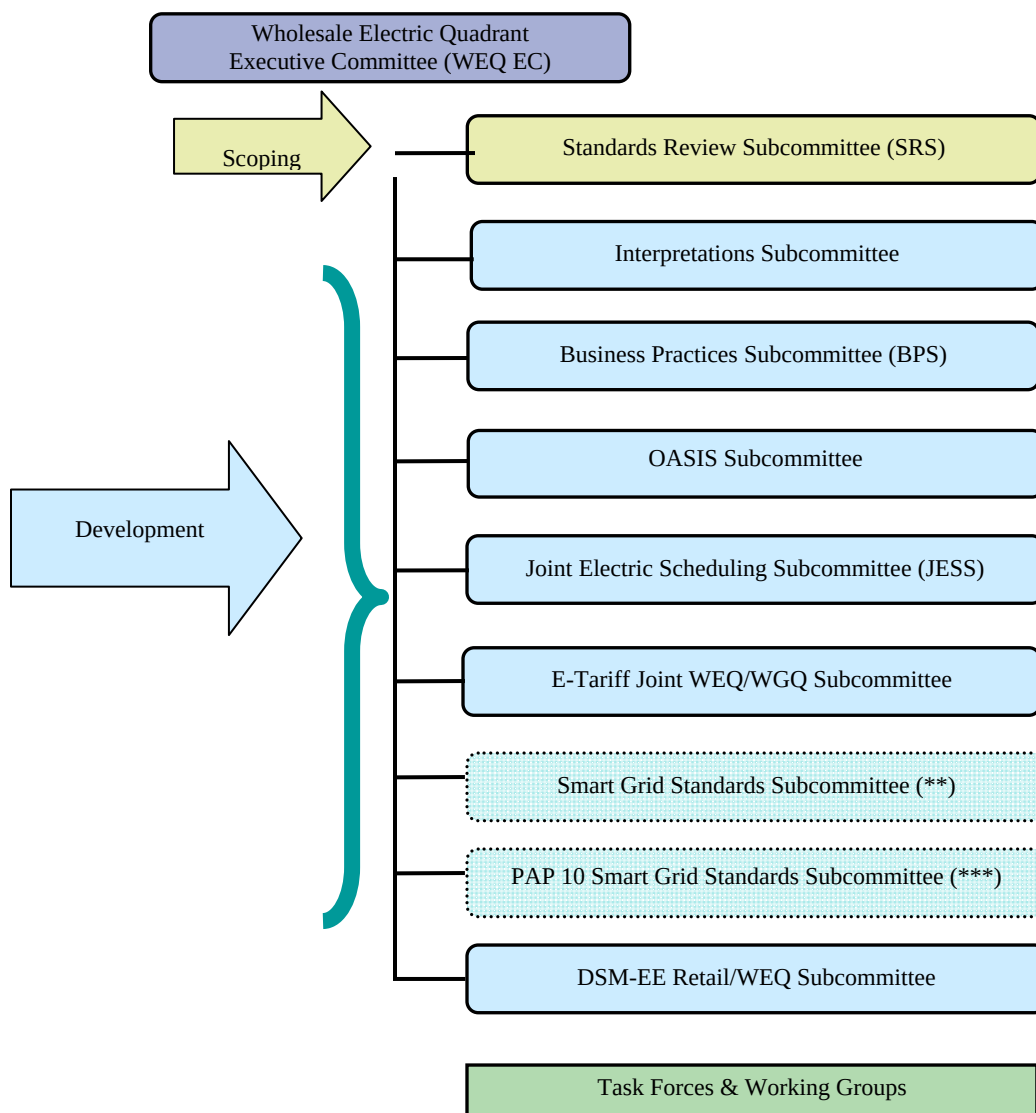
¹¹ Phase 2 of the Parallel Flow Visualization looks at developing options for and reporting of the most cost effective alternatives to achieve curtail obligations assigned during Phase 1."



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WHOLESALE ELECTRIC QUADRANT EXECUTIVE COMMITTEE AND SUBCOMMITTEE STRUCTURE



NAESB WEQ EC and Subcommittee Leadership:

Executive Committee (EC): Kathy York (Chair) and Alan Johnson (Vice Chair)

Standards Review Subcommittee (SRS): Narinder Saini, Ed Skiba

Interpretations Subcommittee: Ed Skiba

Business Practices Subcommittee (BPS) & Time and Inadvertent Management Task Force (TIMTF): Jim Busbin (TLR), Ed Skiba

Open Access Same Time Information System (OASIS) Subcommittee (OS): Paul Sorenson, J.T. Wood, Alan Pritchard

Joint Electric Scheduling Subcommittee (JESS): Bob Harshbarger (NAESB), Clint Aymond (NERC)

e-Tariff Joint WEQ/WGQ Subcommittee (e-Tariff): Jane Daly (WEQ), Keith Sappenfield (WGQ)

Demand Side Management-Energy Efficiency (DSM-EE) REQ/WEQ Subcommittee: Ruth Kiselewich and David Koogler (REQ), Roy True and Paul Wattles (WEQ)

(**) The Smart Grid Standards Subcommittee is a joint group of the retail electric and wholesale electric quadrants with other

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standards development groups such as OASIS (Organization for the Advancement of Structured Information Standards, not Open Access Same Time Information Systems related to NAESB standards and FERC actions), CalConnect, FIX and UCAIug, among others. Direction may be given from NIST, DoE or FERC and the group reports jointly to the NAESB Board Smart Grid Strategic Steering Committee and the WEQ and REQ ECs. The group is chaired by Joe Zhou, Wayne Longcore and Robert Burke.

(***) The PAP 10 Smart Grid Standards Subcommittee is a joint group of the retail electric and wholesale electric quadrants with other standards development groups such as OASIS, UCAIug, OpenADE, ZigBee, ASHRAE, EIS Alliance, NARUC and includes other groups. Direction may be given from NIST, DoE or FERC and the group reports jointly to the NAESB Board Smart Grid Strategic Steering Committee and the WEQ and REQECs. The group is chaired by Phil Precht, Cathy Wesley, Sharon Dinges, David Kaufman, Brad Ramsay, Tobin Richardson and Ed Koch.



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End Notes WEQ 2011 Annual Plan:

¹ Dates in the completion column are by end of the quarter for completion by the assigned committee, sub-committee or task force. The dates do not necessarily mean that the standards are fully staffed to be implementable by the industry, and/or ratified by membership. If one item is completed earlier than planned, another item can begin earlier and possibly complete earlier than planned. There are no begin dates on the plan.

² The assignments are abbreviated. The abbreviations and sub-committee structure can be found at the end of the annual plan document.

³ Energy efficiency may be a wholesale product, such as capacity. Energy efficiency in retail markets may be from individual energy efficiency measures at the project level or a portfolio of projects that make up an energy efficiency program.

⁴ For additional information, please see comments submitted by PJM and Midwest ISO for this Annual Plan Item:
http://www.naesb.org/pdf3/weq_aplan102907w1.pdf.



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November 30, 2010

TO: NAESB Board of Directors and Executive Committee
FROM: Rae McQuade
RE: Schedule of 2011 Meetings

Below is the schedule of 2011 meetings for the Board of Directors, Advisory Council and Executive Committee.

2011 Calendar of Board and Advisory Council Meetings

Date	Meeting	Location
February 12	Advisory Council Meeting	Washington D.C. – Renaissance Washington Hotel (in conjunction with NARUC Winter Meeting)
March 24	Board of Directors	Houston Marriott North at Greenspoint, 255 North Sam Houston Parkway East, Houston, Tx 77060 Phone: 281-875-4000 8 miles from IAH Intercontinental Airport, airport shuttle provided every 30 minutes
June 23	Board of Directors	Houston Marriott North at Greenspoint
September 22	Board of Directors, Meeting of the Members and Strategic Session	Houston Marriott North at Greenspoint
December 8	Board of Directors	Houston Marriott North at Greenspoint

2011 Calendar of Executive Committee Meetings

Date	Meeting	Location
February 1-3	Executive Committee (WEQ, Retail, WGQ)	Host Salt River Project, Phoenix, AZ
February 24-25	Leadership Seminar (WEQ, Retail, WGQ)	Mirage Hotel, Las Vegas
May 3-5	Executive Committee (WEQ, Retail, WGQ)	Host Aces Power, Carmel, IN
August 16-18	Executive Committee (WEQ, Retail, WGQ)	Host El Paso Western Pipeline, Colorado Springs, CO
October 25-27	Executive Committee (WEQ, Retail, WGQ)	Host Dominion, Richmond, VA

Notes:

1. The Retail Executive Committee meetings will be held by conference call and web cast unless otherwise determined by the retail leadership.
2. For each of the Board meetings, a dinner will be held the night before at the Petroleum Club in the Exxon Building, 800 Bell Street, 43rd Floor.
3. Board members are encouraged to attend the leadership seminar as well.