

Seams Catalog Column Headings:

- A Original Number** - The number originally assigned the seam issue. Used to track each issue as it was categorized and re-categorized.
- B Category** - Seam issues are grouped into one of 8 categories:
1. Congestion Management
 2. Market Design
 3. Market Monitoring / Compliance
 4. Market Standards
 5. Planning
 6. System Reliability
 7. Transaction Scheduling
 8. Transmission Service
- C 1st Sub-Category** - The seam issues categories are further delineated into 1st sub-categories.
- D 2nd Sub-Category** - The seam issue 1st sub-categories are even further delineated into 2nd sub-categories.
- E Description Of Seam Issue** - Brief description of the seams issue.
- F Comments** - Additional comments providing background or further definition of the seam issue.
- * **Association / Notes** - Identification of associated seam issues based on their Original Number. (Ed. Note: this column was eliminated once seams issues were categorized).
- * **Seam Interface Type** - Each seam interface has 2 acting parties. Here the market status relationship between the 2 acting parties are identified, e.g., RTO Market to RTO Market, RTO Market to Non-RTO Market, Non-RTO Market to Non-RTO Market. (Ed. Note: this column was eliminated once seams issues were categorized).
- G Resp Org Cobb** - Recommended assignment by Steven Cobb, Salt River Project.
- H Resp Org IRC** - Recommended assignment by Karl Tammar, NYISO, as representative of the IRC.
- I Resp Org Mueller** - Recommended assignment by Ken Brown and Jeff Mueller, PSEG.
- J Resp Org WEQ EC** - Recommended assignment by WEQ EC for JIC meeting held on Feb. 18-19, 2004.
- K NERC Choice** - Recommended assignment by NERC for JIC meeting held on Feb. 18-19, 2004. Not part of the WEQ Seams Subcommittee's work product. Included for informational purposes only.
- L Issue Type** - Categorization of seams issue as either "national" or "regional" in scope.
- M Responsible Organization JIC** - The recommended organization as assigned by the NERC / NAESB / IRC Joint Interface Committee (JIC) at meeting held on Feb. 18-19, 2004.
- L Region 1** - The RTO, ISO, or Non-RTO Market Region that is the 1st acting party to the seam issue is identified here.
- M Region 2** - The RTO, ISO, or Non-RTO Market Region that is the 2nd acting party to the seam issue is identified here.

Seams Catalog Column Headings:

- N Priority** - The organization assigned a seam by the NERC / NAESB / IRC Joint Interface Committee (JIC) will use this column to prioritize their efforts.
- O Seam Impediment Type** - Identification of what causes the seam issue, e.g., market rule, business practice, physical barrier.
- R Currently Being Addressed** - Identification of another body that is currently working on the seam issue.
- S Submitter** - The name of the person and organization providing the matrix information.
- T Reference Papers** - If reference papers are provided to support the information, a letter is assigned to the document. The index of reference papers appears at the end of the matrix.
- U NAESB Support** - Comments of WEQ EC in support of their recommendations contained in column J. Not part of the actual catalog adopted by the EC or JIC. Included for informational purposes only.

Seams Issues Matrix
(As Adopted at JIC Meeting, Feb. 18-19, 2004)

Orig #	Category	1ST Sub-Category	2ND Sub-Category	Description of Seam Issue	Comments	Issue Type	Resp Org JIC	Currently Being Addressed	SRS Comments
36	Congestion Management	Congestion Management Market Coordination	Coordinate Hedging Instruments at Market Interfaces	Coordination of market based congestion hedging instruments, such as FTRs, between adjacent RTOs with markets, especially for out and thru' transactions		National	Undecided		Possible impacts on OWL BP Scope
35	Congestion Management	Congestion Management Market Coordination	Standardize Prices at Market Interfaces	Locational Marginal Prices (LMP) at borders of RTOs with markets (Price cap included)		National	Undecided		Possible impacts on OWL due to sub-category
129	Congestion Management	Congestion Management Market Coordination		Selection process for market/TLR coordinated flowgates; inclusion of flowgates in PJM FTR/ARR auctions; flowgates with and without effective control by markets; updates to flowgate list, phase-in; dispute resolution; let RTO calculate flows outside of IDC and TLR; audit rights; confidentiality of data; consideration of flowgates outside PJM and MISO	Standardized rules for determining flowgates impacted by an RTO.	Regional	Undecided	In PJM/MISO Congestion Management Proposal Whitepaper	No SRS impacts
138	Congestion Management	Congestion Management Market Coordination		Coordination of congestion	Several regional efforts are underway. Coordinate practices and methods between areas with different market approaches.	National	NAESB	Yes	Possible impacts on OWL BP Scope
73	Congestion Management	Operate Markets Within Transmission Limits		Market Design - Day Ahead. Model objective function	Who coordinates the scheduling constraints (i.e., security constrained dispatch) on paths that cross RTO boundaries to ensure that inter-RTO schedules do not exceed reliability standards? (Issue I.b.6)	Regional	Undecided	SSG-WI, CMA Work Group	Possible impacts on OWL BP Scope
43	Congestion Management	Standardize and Coordinate ATC Calculations	Contract Tie Capacity Sharing	Allow Sharing Contract Tie Capacity between Entities across Seams	Lack of Coordination and Sharing of Tie Capacity is an artificial market barrier	National	Undecided	Limited	ATC working group
17	Congestion Management	Standardize and Coordinate ATC Calculations and Postings	Reconcile ATC Calculations Between Physical and Financial Transmission Markets	TTC-ATC calculation/posting	Interface between a financial market (no physical transmission arrangements) and physical transmission regions (selling transmission capacity through OASIS reservations): Problems of TTC-ATC calculations coordination. Counterparties include IMO, NYISO, and ISO-NE.	Regional	Undecided	No	ATC working group
9	Congestion Management	Standardize and Coordinate ATC Calculations and Postings		Transmission Calculations	Transmission calculations are not consistent. Solution: Standardized ATC Calculations.	National	Undecided	Yes - SSG - WI	ATC working group
55	Congestion Management	Standardize and Coordinate ATC Calculations and Postings		Improved TTC/ATC posting	Monthly and yearly posting of TTC/ATC values to support transaction pre-scheduling. Clarify how the ATC values calculated by each ISO should be used to ascertain the ability of the interface to support transactions.	Regional	Undecided	Northeast ISO	ATC working group
109	Congestion Management	Standardize and Coordinate ATC Calculations and Postings		ATC Differences - Individual control areas determine ATC for jointly operated transmission interfaces. Differences in ATC calculations can confuse the marketplace, which may react by avoiding transactions that would otherwise be economic due to the uncertainty and perceived risk.		Regional	Undecided	In Northeast Power Markets Seams Action Plan	ATC working group

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116	Congestion Management	Standardize and Coordinate ATC Calculations and Postings		ATC/AFC Coordination - MISO and PJM to coordinate with any external parties wishing to do so, respecting all significant flowgates external to their respective boundaries; availability and levels of service and curtailments for firm and non-firm, network and point to point.		Regional	Undecided	In PJM/MISO Congestion Management Proposal Whitepaper	ATC working group
69	Congestion Management	System Market Modeling Coordination	Standardize Prices at Market Interfaces	Market Design - Day Ahead. Energy Spot Market	In order to achieve a uniform set of redispatch prices, if that is necessary, do the network models have to be identical, with the exact system? Each time each one is used does it have to be synchronized with the other RTOs or is a single process required? In addition do the programs that use the models have to be identical in order to get the uniform set of redispatch prices? (Issue I.b.2)	Regional	Undecided	SSG-WI, CMA Work Group	Possible impacts on OWL BP Scope
75	Congestion Management	System Market Modeling Coordination		Market Design - Day Ahead. Model objective function	Does the use of both AC and DC OPFs introduce compatibility problems? (Issue I.b.8)	Regional	Undecided	SSG-WI, CMA Work Group	No SRS impacts
121	Congestion Management	System Market Modeling Coordination		Market flow data - reflect ISN and SDX data	Standardize inputs to estimation of power flows (i.e., GLDFs, outages, etc...).	Regional	Undecided	In PJM/MISO Congestion Management Proposal Whitepaper	No SRS impacts
123	Congestion Management	System Market Modeling Coordination		GDLF calculation	Standardized methodology for determining distribution factors - standard OPF model for each interconnection?	Regional	Undecided	In PJM/MISO Congestion Management Proposal Whitepaper	No SRS impacts
113	Market Design	Green Power Market		Green power attributes trading		National	Undecided	In Northeast Power Markets Seams Action Plan	No SRS impacts
16	Market Design	Transmission Ancillary Service Market Design and Coordination	Reactive Power Compensation	Compensation for Reactive Power	Lack of compensation lessens incentives for operators to solve problems and for accountants to spend money on metering.	National	Undecided	Yes / IIPTF	Potentially linked to NERC Standard 600
74	Market Design	Transmission Ancillary Service Market Design and Coordination		Market Design - Day Ahead. Model objective function	What is the effect of linking energy and ancillary service markets in the optimizations on model coordination issues? (Issue I.b.7)	Regional	Undecided	SSG-WI, CMA Work Group	No SRS impacts
13	Market Design	Unscheduled/Parallel Path Flow Management	Compensation for Unscheduled/Parallel Path Flow	Compensation for Unscheduled Flows of Electricity	Lack of compensation lessens incentives for operators to solve problems and for accountants to spend money on metering.	National	Undecided	Yes / IIPTF	Possible impacts on OWL BP Scope
15	Market Design	Unscheduled/Parallel Path Flow Management	Compensation for Unscheduled/Parallel Path Flow	Compensation for Loop Flow	Lack of compensation lessens incentives for operators to solve problems and for accountants to spend money on metering.	National	Undecided	Yes / IIPTF	Possible impacts on OWL BP Scope

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29	Market Design	Unscheduled/Parallel Path Flow Management	Compensation for Unscheduled/Parallel Path Flow	Allocation of transmission capacity on reciprocal flow gates amounts to transmission service without compensation. Legitimizes "parallel loop flow".		National	Undecided		Possible impacts on OWL BP Scope
134	Market Design	Unscheduled/Parallel Path Flow Management	Compensation for Unscheduled/Parallel Path Flow	Compensation for parallel flows		National	NAESB	In PJM/MISO Congestion Management Proposal Whitepaper	Possible impacts on OWL BP Scope
3	Market Standards	Energy Market Standard Product Definitions		Definition & treatment of Firm/nonfirm Power	Annual Plan Item 4ci moved from MOS	National	Undecided	No	No SRS impacts
10	Market Standards	Energy Market Standard Product Definitions		Energy Products	Entities have disagreements concerning the definitions of various energy products. Solution: Standardized Energy Products.	National	NAESB	Yes - WECC	No SRS impacts
25	Market Standards	Energy Market Standard Product Definitions		Need for common physical market and products - regional variations permitted		National	NAESB	No	No SRS impacts
34	Market Standards	Energy Market Standard Product Definitions		Clarification of Product Definitions	Complete/Standard definitions for Liquidated Damages (LD), "Into", etc.	National	NAESB	No	No SRS impacts
139	Market Standards	Energy Market Standard Product Definitions		Standard definition of energy products	Energy products and services have common attributes in all markets. Standards definitions will improve efficiencies in communicating and operating between areas with various market designs	National	NAESB	Yes	No SRS impacts
42	Market Standards	Market Standard Communication Protocols and Transparency		Data Visibility	Inability to view neighboring markets information through a common software such that this sometimes hinders Market Participants ability to complete business in a timely fashion.	National	NAESB	Yes	No SRS impacts
52	Market Standards	Market Standard Communication Protocols and Transparency		Confidentiality of Data and Information Shared	Standards of Confidentiality would enhance the capability to resolve data sharing and information posting	National	NAESB	Limited	No SRS impacts
71	Market Standards	Market Standard Communication Protocols and Transparency		Market Design - Day Ahead. Model spatial granularity	To what extent do RTOs need to see other RTOs' scheduling information? (Issue I.b.4)	Regional	Undecided	SSG-WI, CMA Work Group	No SRS impacts
140	Market Standards	Market Standard Communication Protocols and Transparency		Standard messaging protocols for market notifications	Market participants will benefit from common messaging protocols.	National	NAESB	No	No SRS impacts
1	Market Standards	Market Standard Operating Time		Non Standard Time Zone	The lack of a standard Time Zone causes Market Inefficiencies	National	NAESB	No	No SRS impacts
136	Market Standards	Market Standard Operating Time		Inconsistent Market Event Timelines	There is a disconnect between the timing of bids and offers in the Ontario market and the releasing of firm transmission in MISO for which schedules have not been submitted for use as non-firm transmission.	Regional	Undecided	No	No SRS impacts

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14	Market Standards	Physical and/or Financial Resolution of Inadvertent Interchange		Compensation for Inadvertent Interchange	Lack of compensation lessens incentives for operators to solve problems. Explicit compensation for inadvertent interchange is necessary for appropriate definition of other products, in that such compensation ensures that the defined product is delivered.	National	NAESB	Yes / IIPTF	No SRS impacts
46	Planning	Transmission Expansion and Generator Interconnection Coordination	Generator Interconnection - Affected Systems	Generation Interconnection Studies	Generation Interconnections close to seam affects both areas	National	Undecided	Limited	No SRS impacts
114	Planning	Transmission Expansion and Generator Interconnection Coordination	Interregional Transmission Planning Procedures	Coordination of interregional planning including transmission facilities and generator interconnection procedures		Regional	Undecided	In Northeast Power Markets Seams Action Plan	Possible impacts on Assess Future Transmission Needs SAR
50	System Reliability	Generation-Load Balance	Interchange Schedule Ramping Requirements	Schedule Ramp Management	Ramping standard differences across the seams hinder business	National	Undecided	Limited	No SRS impacts
108	System Reliability	Generation-Load Balance	Interchange Schedule Ramping Requirements	Failure of Transactions due to Ramping of Control Area Interchange - Desirable transactions between control areas may be "blocked" from access to the grid due to insufficient dispatch capacity to absorb large schedule changes while maintaining energy/load balance within the control area.		Regional	Undecided	In Northeast Power Markets Seams Action Plan	No SRS impacts
120	System Reliability	Inter-Market and Intra-Market Facility Outage and Maintenance Coordination		Facilities in close electrical proximity under different RTOs - outage maintenance coordination, access and expansion planning		Regional	Undecided	In PJM/MISO Congestion Management Proposal Whitepaper	No SRS impacts
126	System Reliability	Unscheduled/Parallel Path Flow Management	Interchange Distribution Calculator Requirements	Definition of coordination between market entity (PJM or MISO) and the IDC; define necessary changes to IDC; updates of base cases and book of flowgates		Regional	Undecided	In PJM/MISO Congestion Management Proposal Whitepaper	No SRS impacts
23	System Reliability	Unscheduled/Parallel Path Flow Management	Parallel Path/ Unscheduled Flow Monitoring and Operation	How different congestion management methodologies will interact to ensure parallel flows and impacts are recognized and controlled to ensure system reliability.	Being reviewed by PJM/MISO.	Regional	Undecided	Yes	Possible impacts on OWL BP Scope
39	Transaction Scheduling	Controllable Line Scheduling		Controllable Line Scheduling	Concept of operations for general methodology to schedule controllable lines between RTOs. Being reviewed by NYISO	Regional	Undecided	Yes	No SRS impacts
12	Transaction Scheduling	Interchange Scheduling Standardized Protocols	Develop Electronic Scheduling	Interchange/Intrachange Scheduling Data Exchange	Current E-Tagging process is inadequate for exchanging reliability and market data within the Western Interconnection. Solution: Electronic Scheduling	National	NAESB	Yes - WECC	No SRS impacts

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41	Transaction Scheduling	Interchange Scheduling Standardized Protocols	Inter-Market Ramping Requirements Standardization	Scheduling Coordination (including Ramp Rates)	RTOs have different ramp rates and scheduling requirements that require Market Participants to complete multiple submissions for the same transaction.	National	Undecided	Yes	No SRS impacts
79	Transaction Scheduling	Interchange Scheduling Standardized Protocols	Standardize Inter-Market Scheduling Timelines	Market Design - Day Ahead. Other Scheduling Requirements	Should the time intervals and submission times be synchronized to mitigate obstacles to inter-RTO trade? (Issue I.b.12)	National	NAESB	SSG-WI, CMA Work Group	No SRS impacts
78	Transaction Scheduling	Interchange Scheduling Standardized Protocols	Tools and Procedures to Accommodate Inter-Market Interchange Scheduling Requirements	Market Design - Day Ahead. Schedule Components	Can tools be developed for scheduling submission that assist the user in meeting any differences in protocols between RTOs? (Issue I.b.11)	National	Undecided	SSG-WI, CMA Work Group	No SRS impacts
76	Transaction Scheduling	Interchange Scheduling Standardized Protocols		Market Design - Day Ahead. Model objective function	Do differences in the scheduling requirements (e.g., requirements for balanced schedules) between RTOs create seams problems for inter-RTO schedules? If so, can these problems be mitigated? (Issue I.b.9)	Regional	Undecided	SSG-WI, CMA Work Group	No SRS impacts
104	Transaction Scheduling	Interchange Scheduling Standardized Protocols		Transmission Checkout Failure - Operators curtail transactions due to mismatched tag data, different MW volumes, etc. The curtailment of transactions due to data incompatibility is disruptive to both the marketplace and the reliable operation of the grid.		National	NAESB	In Northeast Power Markets Seams Action Plan	No SRS impacts
106	Transaction Scheduling	Interchange Scheduling Standardized Protocols		Transaction Scheduling - Inconsistent information and market timing rules lead to uncertainty and risk that discourage the scheduling of some inter-regional transactions.		National	NAESB	In Northeast Power Markets Seams Action Plan	No SRS impacts
4	Transmission Service	Transmission Market Standard Product Definitions and Priorities		Definition & treatment of Firm/nonfirm Transmission	Annual Plan Item 4cii moved from MOS	National	Undecided	No	No SRS impacts
103	Transmission Service	Transmission Market Standard Product Definitions and Priorities		Transmission Service - Market participants require consistent treatment of transmission products across multiple control areas to reduce perceived market risk, scheduling confusion and uncertainty.		National	NAESB	In Northeast Power Markets Seams Action Plan	No SRS impacts
117	Transmission Service	Transmission Service Procurement	Common Reservation System for Market Interface Transmission ATC	Contract Tie Capacity - One Stop Shopping		Regional	NAESB	No	ATC working group
6	Transmission Service	Transmission Service Procurement	Common Western Interconnection Wide OASIS	Transmission Access	No transmission market one stop shopping available for the Western Interconnection - entities can't find needed information to efficiently conduct business on a preschedule or real-time basis. Solution: Common OASIS Site needed.	Regional	Undecided	Yes - Various Transmission Providers	No SRS impacts
33	Transmission Service	Transmission Service Procurement	Intra-Hour Transmission Service Procurement	Standard for Purchasing of Intra-Hour Transmission	The ability to purchase transmission after the top of the hour when the transmission service is predetermined as available in prior hour.	National	NAESB	No	No SRS impacts

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28	Transmission Service	Transmission Service Settlement	Consolidate Multiple Market Transmission Service Settlement Statements	Multiple transmission service charge invoicing	Being reviewed by PJM/MISO.	National	NAESB	Yes	No SRS impacts

#	Reference Paper or Supporting Document Provided
A	"Profit-Enhancing Seam Management: A White Paper on Pricing The Unscheduled Flows of Electricity Across the Seams Between Utilities Using A Geographically Differentiated Auction of Inadvertent Interchange", released 2001 March 25 (Mark Lively - Lively Utility).
B	"WOLF: Wide Open Load Following," A presentation to the NERC Market Interface Committee, 2002 September 4-5, Houston, Texas (Mark Lively - Lively Utility).
C	E-Mail by Mark Lively to NAESB WEQ Seams Subcommittee of 9/4/2003 8:28:10 PM Eastern Standard Time (Mark Lively - Lively Utility).
D	See the PJM/MISO JOA dated 8/5/03 (Linda Horn - WE Energies).
E	MISO - PJM Managing Congestion to Address Seam Paper, April 28, 2003 (Dave Nick - DTE Energy) (Ed. note: white paper updated Aug. 4, 2003).
F	<i>Intentionally left blank.</i>
G	Northeast ISOs Seams Resolution Report: History of Seam Issues Resolution (Jan. 15, 2003); and Ongoing Northeast ISOs "Seams" Projects, 2003-2004 (Jan. 14, 2003) (Joe Rossignoli - National Grid).
H	In Northeast Power Markets Seams Action Plan - October 9, 2002 and July 14, 2003, and July 3, 2003 timeline update (Jeff Mueller - PSEG).
I	Attachement A of MISO and PJM Reliability Plans (Jeff Mueller - PSEG).
J	MISO compliance filings in FERC Docket No. EL03-35-004 and in Whitepaper "Managing Congestion to Address Seams" PJM and MISO May 16, 2003 (Jeff Mueller - PSEG).
K	ATC's Attachment K (Jeff Mueller - PSEG).
L	M. Lively, Forcing Reserves to Compete with a Physical Market (2002) (Lou Oberski -- Dominion Energy).