

NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL

Princeton Forrestal Village, 116-390 Village Boulevard, Princeton, New Jersey 08540-5731

NERC-NAESB-ISO/RTO Council Joint Interface Committee Meeting

June 2, 2003

EEl Offices

Washington, DC

1:00 pm to 5:00 pm Eastern

Meetings are business casual

1. Welcome
 - a. Introductions
 - b. Antitrust statement
 - c. Agenda approval
2. Review of the NERC-NAESB-IRC MOU (M. Desselle)
 - a. Role of the JIC
 - b. Voting procedures
 - c. Use of alternates
 - d. Naming of co-chair from the IRC
3. Report from NERC-NAESB-IRC coordination team (S. Corneli, K. Tammar and D. Benjamin)
4. Status report – NERC Cyber Security Standard (T. Gallagher)
5. Review proposals for NERC Reliability Standards (**Action**)
 - a. “Coordinate Operations”
 - b. “Coordinate Interchange”
6. Future Meetings
7. Adjourn

Those wishing to join via conference call may do so by dialing 713-481-1333. The pass code is “NAESB” and the conference leader is “McQuade”.

Background Information for Item 1

None

Background Information for Item 2

The JIC has been expanded to incorporate members of the ISO/RTO Council (IRC). Michael Desselle will review key elements of the memorandum of understanding among the three parties.

The JIC will be co-chaired by one representative each from NERC, NAESB and the IRC. The IRC co-chair will be named at this meeting.

Attachment: NERC-NAESB-IRC MOU

Action: Name IRC co-chair.

Background Information for Item 3

One of the key roles of the JIC is the coordination of ongoing and future activities occurring in NERC, NAESB and the RTOs/ISOs in order to minimize duplication and overlap. A small team comprised of a representative from each organization has been assembled to outline how best to achieve this coordination.

Steve Corneli, Don Benjamin, and Karl Tammar, members of the coordination team, will present a status report of the team's efforts to date.

Attachment: None

Action: None

Background Information for Item 4

An urgent action cyber security standard was developed via the NERC standards development process. The JIC reviewed this proposed standard in early April and determined that it should be addressed in the NERC process. The standard was balloted in late May. Tim Gallagher will provide a report on the status of this standard.

Attachment: None

Action: None

Background Information for Item 5(a):

The Standards Authorization Request (SAR) presented below has completed its industry review and the NERC Standards Authorization Committee (SAC) has approved it for standards drafting. Consistent with the provisions of the NERC-NAESB-IRC MOU, this request is being submitted to the JIC for consideration and assignment to either the NAESB or NERC process for standards drafting.

The Coordinate Operations SAR drafting team (SARDT) has developed its SAR such that industry consensus has been achieved regarding:

- The need for the proposed standard.
- The scope of the proposed standard.

The SARDT feels that additional refinement of this SAR will not make a significant improvement in the level of industry consensus.

History

- Jim Byrd submitted the Coordinate Operations SAR on March 7, 2002.
- The Interim SAC accepted the SAR for posting on March 20, 2002.
- The industry-segment based SAC appointed a SARDT on November 6, 2002 to work with the SAR requestor to refine the SAR.

Reaching Consensus on the Need for the Proposed Standard:

Industry consensus on the need for the proposed standard was established through the comments submitted on the original posting of the SAR. Forty-six of fifty entities responding to the initial posting of the SAR indicated that this standard is needed. Two objectors stated that FERC should decide who develops standards and two did not believe a reliability need for the standard has been established.

Reaching Consensus on the Scope of the Proposed Standard

The SAR was posted for two separate public comment periods:

- April 2 – May 3, 2002 (this version of the SAR included only the purpose and brief description – no detailed description)
- Feb 15 – March 17, 2003

Following each posting, the SARDT met and considered the comments submitted by industry participants. After each meeting, the SARDT:

- Posted their consideration of the industry's comments
- Posted the revised SAR
- Posted a special SAR comment form designed to capture additional information on the need for additional changes to the scope of the SAR.

While there have been many minor changes to the original SAR to ensure that its purpose and intent is clearly understood, the most significant changes to the SAR were to:

- refine the focus of the SAR from ‘coordinate operations’ to ‘coordinate operations between entities performing the reliability authority (RA) function.’ The SAR does not address coordination between the entity performing the RA function and the lower level functions that work under the authority of the entity performing the RA function, and the SAR does not address coordination between any of the lower level functions – such as between entities performing the transmission operator functions.
- eliminate redundant requirements. The second version of the SAR included a requirement to document the authority of the entity performing the RA function – this was eliminated from the SAR because it is addressed in the RA certification SAR.
- add a requirement that the standard address appropriate actions when RAs cannot agree upon a solution for an impending or actual problem. This was a minority suggestion that was endorsed by both the SAR requestor and the SARDT and was therefore included in the final version of the SAR.

Please note that the industry has not commented on the requirement that the standard address appropriate actions when entities performing the RA function cannot agree upon a solution to an impending or actual problem. The SARDT and requestor felt that the industry need for this requirement was obvious and collecting specific feedback on this new requirement wasn’t needed.

Minority Opinions:

1. The SAR should address coordination between all functions
2. The SAR should not identify any requirements that aren’t specifically identified in the NERC *Functional Model*
3. The SAR should address resolution of conflicts between generation and transmission outages; should include a requirement that all RAs follow a standard process for resolution of conflicts related to transmission outages; should include a requirement that the RA have authority to approve generator outages.

JIC members may review the evolution of this SAR and all industry comments and the associated responses by visiting: <http://www.nerc.com/~filez/standards/Coordinate-Operations.html>

Attachments: Final version of the Coordinate Operations SAR

Action: Review and assign to either NERC or NAESB for standards development

Background Information for Item 5(b):

The Standards Authorization Request (SAR) presented below has completed its industry review and the NERC Standards Authorization Committee (SAC) has approved it for standards drafting. Consistent with the provisions of the NERC-NAESB-RTO Council MOU, this request is being submitted to the JIC for consideration and assignment to either the NAESB or NERC process for standards drafting.

The Coordinate Interchange SAR drafting team (SARDT) has developed its SAR such that industry consensus has been achieved regarding:

- The need for the proposed standard.
- The scope of the proposed standard.

The SARDT feels that additional refinement of this SAR will not make a significant improvement in the level of industry consensus.

The Coordinate Interchange SARDT has refined the SAR so that industry consensus has been reached on the need for the proposed standard and also on the scope of that standard. The SARDT feels that additional work on refining this SAR will not make a significant improvement in the level of industry consensus.

History

- Jim Byrd submitted the Coordinate Interchange SAR on March 7, 2002.
- The Interim SAC accepted the SAR for posting on March 20, 2002.
- The Interim SAC appointed a SARDT on July 2, 2002

Reaching Consensus on the Need for the Proposed Standard:

Industry consensus on the need for the proposed standard was established through the comments submitted on the original posting of the SAR. About fifty entities responded to the initial posting of the SAR and the majority indicated that this standard is needed. Four objectors felt the proposed standard was too commercial in nature, two stated that FERC should decide who develops standards, and three supported the standard, but only if combined with the ‘Coordinate Operations’ standard.

Reaching Consensus on the Scope of the Proposed Standard

The SAR was posted for three separate public comment periods:

- April 2 – May 3, 2002 (this version of the SAR included only the purpose and brief description – no detailed description)
- August 29 – September 30, 2002
- January 31 – March 7, 2003

Following each posting, the SARDT met and considered the comments submitted by industry participants. After each meeting, the SARDT:

- Posted their consideration of the industry's comments
- Posted the revised SAR
- Posted a special SAR comment form designed to capture additional information on the need for additional changes to the scope of the SAR.

There have been many changes to the original SAR to ensure that its purpose and intent is clearly understood. The most significant changes to the SAR were clarifications to ensure that the new standard supports the relationships of the interchange authority function as presented in the *Functional Model*. The drafting team was challenged while modifying this SAR because many of the industry participants commenting on the SAR, as well as SARDT members, do not have a clear understanding of how the *Functional Model* will be implemented. The following changes were made during the evolution of this SAR:

- Refined the purpose to clearly indicate that coordination of interchange transactions does not occur directly between entities performing the balancing authority function – rather the coordination takes place through the interchange authority.
- Added more details to the purpose to provide a clearer link between coordinating interchange and reliability.
- Refined the brief description to more clearly limit the scope of the SAR to just the reliability-related elements associated with coordinating interchange transactions.
- Added a detailed description that includes a list of requirements to be developed for the balancing authority (BA), interchange authority (IA), reliability authority (RA), transmission service provider (TSP) and purchasing-selling entity (PSE) functions.

The Coordinate Interchange SAR **does not** include any requirements that address business practices such as:

- How the PSE arranges energy deals
- Interchange schedule accounting
- Loss compensation

In addition, there are some other requirements in NERC's existing Operating Policy 3 that are **not carried over** to the new SAR, and these include:

- Tagging requirements (the existing tagging system may not be used in the future)
- Transaction curtailments (emergency-related curtailments will be addressed in the SAR that deals with emergencies)

- Confidentiality agreements (addressed in certification SARs)

Minority opinions expressed during the comment periods:

1. **The SAR should include requirements for the generator and load serving entities.** Under the *Functional Model*, the generator and load serving entity (LSE) are expected to provide information to the PSE, and the PSE is expected to provide the data to the IA. The data provided to the PSE is expected to be addressed in tariffs and contracts rather than in a NERC standard. The IA may communicate information directly with generators and LSEs, but this is a requirement for the IA, not the generators and LSEs. The SARDT did not add any requirements to the SAR for the generator or LSE.
2. **The SAR may not be applicable in certain markets.** The Functional Model Review Task Group (FMRTG) met with those who submitted this comment and tried to explain how the *Functional Model* will work in various market structures. The information provided by the FMRTG did not satisfy the commenters. The commenters submitted these comments as a general concern but did not provide specific suggestions for modifications that would satisfy their concerns. The SARDT did not make any conforming changes to the SAR.
3. **Because the SAR focuses solely on the reliability-related aspects of coordinating interchange, the SAR may undermine the development of market solutions or the development of business practices.** The commenters submitted this comment as a general concern. One specific suggestion was made to modify this SAR to eliminate a market concern: “. . .NERC must rely upon NAESB to develop business standards for PSEs to provide any necessary data for the analysis of ‘interchange’ as defined by NERC for reliability purposes.” The SARDT did not make any conforming changes to the SAR as a result of this comment. (*See attached statement from Charles Yeung, which provides more details regarding this position.*)

Unresolved Issue:

In parallel with the SAR refinement, the SARDT attempted to establish a set of definitions for the terms used in the SAR. The SARDT was only partially successful in this endeavor. To resolve the issue, the SARDT developed a questionnaire and submitted the questionnaire to those industry participants who had submitted comments on definitions. Only a subset of those who received a questionnaire responded to the survey. The SARDT wishes to leave the resolution of the terminology to the standards drafting team assigned to draft this standard. The last set of definitions and the responses to the questionnaire sent to industry participants has been submitted to the Director of Standards.

JIC members may review the evolution of this SAR and all industry comments and the associated responses by visiting: <http://www.nerc.com/~filez/standards/Coordinate-Interchange.html>

Attachments:

1. Final version of the Coordinate Interchange SAR
2. Statement from SAR drafting team member Charles Yeung

Action: Review and assign to either NERC or NAESB for standards development

**Amended and Restated Memorandum of Understanding for the
North American Energy Standards Board, North American Electric Reliability Council
and the ISO/RTO Council**

This Memorandum of Understanding (“MOU”) is entered into this 15th day of May, 2003, among the North American Energy Standards Board (“NAESB”), the North American Electric Reliability Council (“NERC”), and the Independent System Operator/Regional Transmission Organization Council (“ISO/RTO Council”) (collectively, “Parties”).

Whereas NAESB is the primary industry forum for development and promotion of business practice and electronic communication standards in North American wholesale and retail natural gas and electricity markets and its stakeholder-based standards development process is well-suited for the resolution of issues that affect or implicate business practices;

Whereas NERC is the primary industry organization for developing reliability standards for the reliable operation and planning of the bulk electric systems serving North America and NERC as an organization is well-suited for addressing reliability issues related to such standards;

Whereas the ISO/RTO Council is a duly formed organization composed of ISO and RTO chief executive officers, and its Charter has been filed with the Federal Energy Regulatory Commission (“FERC”) and other appropriate regulatory authorities in North America;

Whereas each of the Parties has duly authorized its representative to execute this MOU and bind the Organization to abide by the provisions set forth in this MOU;

Whereas the ISO/RTO Council is not a standards development organization, but may participate in standardization activities and existing standards development organizations, including preparing proposed standards for those organizations;

Whereas the Parties understand “policy” in the context of this MOU to mean a definite course of action selected from among alternatives that will guide and determine subsequent material decisions, and also understand “ISO and RTO policy” to mean major market and transmission tariff policies¹ that would normally be proposed and implemented by ISOs and RTOs and which require approval by the FERC or other appropriate regulatory authorities in North America;

¹ In Canada, the more common term for this is market rules.

Whereas NAESB is precluded by its Charter from setting industry policy, NERC is organized to set reliability policy, and individual RTOs and ISOs are organized to operate transmission systems and administer markets;

Whereas individual ISOs and RTOs must, in carrying out their responsibilities, develop ISO and RTO policy proposals and must also, subject to receiving all required and appropriate regulatory approvals, implement such policies;

Whereas the Parties agree that there is a need to develop and maintain standards to enhance electricity markets and maintain reliability throughout North America;

Whereas the Federal Energy Regulatory Commission (“FERC”) has “strongly urged” the Parties to coordinate standards development efforts;

Whereas most electric industry standards have both business and reliability implications and range along a continuum from “predominantly reliability” in nature to “predominantly business” in nature;

Whereas the Parties agree that a coordination process should be developed among the Parties to ensure that the development of business practice and reliability standards is coordinated and harmonized with the development, approval and implementation of ISO and RTO policy and that every practicable effort is made to eliminate overlap and duplication of efforts;

Whereas, the FERC Commissioners and Staff have encouraged the Parties to bring the functions previously addressed by the Electronic Scheduling Collaborative (“ESC”) and the Oasis Standards Collaborative (“OSC”) into the functionally appropriate Party organization, and through that organization into a single process for coordinating standard-setting;

Whereas, the Parties agree that all the current activities of the ESC and OSC should be included in one or several of the Parties’ organizations and thus brought into the single standard setting coordination process as defined in this Memorandum of Understanding;

Whereas, the Parties agree that the coordination that takes place under this MOU should not delay the development of standards or the implementation of ISO and RTO policy;

Whereas, the Parties shall not be obliged to change their existing standards approval processes, but the parties agree it would be beneficial to keep an open mind for future changes to be considered that would improve the processes and achieve the goals contained within this MOU; and,

Whereas, the Parties intend this MOU to be a living document and recognize that the coordination procedures detailed in this MOU are likely to require revision as the Parties gain experience working under these procedures,

Now therefore, the Parties agree as follows:

1. Purpose and Principles of Agreement

1.1 The Parties propose to establish a coordination process set forth in Section 2 of this MOU. The coordination process is intended to avoid overlap and duplication of effort in the activities of the three organizations by distinguishing the development, proposal and implementation of ISO and RTO policy from the setting of reliability standards or business practice standards. The coordination process will accomplish this primarily through the Joint Interface Committee (“JIC”) comprised of representative members of NERC, NAESB and the ISO/RTO Council. The JIC is not intended to delay standards development or the implementation of ISO and RTO policy, but to facilitate efficient policy implementation and standards development and to avoid duplication of effort between and among the Parties.

1.2 The Parties recognize that many standards have implications that affect aspects of reliability, market administration and transmission system operation, and business standards and communication protocols. Accordingly, the JIC will evaluate each standards development proposal, as well as the annual plans² of each organization, in a two-stage process as described in section 2.5 before determining whether NAESB or NERC should develop the proposed standard.^{3 4}

1.3 The Parties intend to have the coordination process set forth in Section 2 of the MOU in full operation by June 1, 2003. The Parties may mutually agree to move the start date for the coordination process.

² The JIC is not limited to new standards or annual plan items, but can receive existing proposed standards or annual plan items referred to it by any Party.

³ While the JIC will evaluate the disposition of standards with the recognition that most standards have both reliability and business standards and communication protocols implications, the intent of NERC and NAESB (through the JIC) is that the coordination process should work toward the development of “standards for the industry” and avoid characterizing standards, wherever possible.

2. Coordination Process

2.1 The Parties agree to establish a process, as set forth in this section, for coordinating the development of proposed standards, in accordance with the principles in Section 1 of this MOU.

2.2 The JIC shall be responsible for the coordination process. The JIC shall be composed of representatives from NERC holding one-third of the votes, representatives from NAESB WEQ holding one-third of the votes and representatives from the ISO/RTO Council holding one-third of the votes. Each Party will determine its representatives to the JIC, with every effort to have each segment or area represented. The quorum necessary for the transaction of business at meetings of the JIC shall require a majority of the representatives of each of any two Parties. Any or all members of the JIC may participate in a meeting, including being counted as part of the quorum, by means of a communication system by which all persons participating in the meeting are able to hear each other. Use of notational balloting or proxies will not be permitted. NERC, NAESB and the ISO/RTO Council will separately determine whether designated alternates will be permitted to participate in place of their absent JIC representatives. The JIC will have co-chairs, one representing NERC, one representing NAESB, and one representing the ISO/RTO Council chosen by each Party from among its JIC representatives.

2.3 Decisions of the JIC will be by a simple majority of all votes cast, with each NERC representative present at a meeting having a vote equal to 33.3% divided by the number of NERC representatives participating in the meeting, each NAESB representative having a vote equal to 33.3% divided by the number of NAESB representatives participating in the meeting, and each ISO/RTO Council representative having a vote equal to 33.3% divided by the number of ISO/RTO Council representatives participating in the meeting. In the event any Party fails to be represented by at least one representative and quorum requirements are met, the remaining two Parties shall each receive 50% of the vote, to be divided equally among the Party's representatives. In the event of a tie vote, the matter will be referred to the Chairmen of the Parties present for the tie vote [or their Board level designee(s)] for resolution. In the determinations made under Section 2.6, each Party may abstain from voting on any question in which it determines it does not have a material interest.

⁴ The Parties expressly agree that reliability and business practice standards that are required for ISO/RTO Council activities would typically be developed by NERC and NAESB, consistent with this MOU.

2.4 The JIC will meet as necessary to review the annual plans of each organization. Additionally, the JIC will meet as necessary to review each Standards Authorization Request (“SAR”) that the Standards Authorization Committee (“SAC”) of NERC has approved for the drafting of a standard, each standard request that the NAESB Executive Committee (“EC”) has assigned to the Wholesale Electric Quadrant (“WEQ”) of NAESB and each ISO and RTO policy anticipated to be proposed or implemented by the ISO/RTO Council’s constituent organizations that may affect business practice standards and reliability standards.

2.5 In the first stage of its process, the JIC will evaluate the annual plans of each Party. If the JIC determines that an annual plan item would establish or require substantial modification to ISO and RTO policy, then standard setting activities associated with the annual plan item would normally be deferred⁵ until the FERC or other appropriate regulatory authorities in North America have exercised their authority to determine such policy issues. Once such ISO and RTO policy issues have been resolved, further standards development activity will be coordinated by the JIC according to this MOU. If the JIC does not determine that an annual plan item would establish or require substantial modification to ISO and RTO policy, then the item would continue through the standards development process. If the JIC determines that an aspect of the ISO/RTO Council’s annual plans would alter or require new business practice standards, communication protocol standards or reliability standards, those standards development activities would be coordinated by the JIC according to this MOU. The JIC may also recommend that a particular item or aspect of an item in one Party’s annual plan be removed from that Party’s annual plan and added to another Party’s annual plan in order to carry out the purposes of this agreement.

2.6 Once the JIC has made the determinations in section 2.5, the second stage of the process will take place. In this stage the JIC will consider the relationship of each specific standards proposal, including any standards proposals derived from ISO and RTO annual plan items, to the reliability responsibilities of NERC and the business standards and electronic communication protocol responsibilities of NAESB, and will refer the development of the standard as appropriate to the two organizations. In this stage, the JIC may also determine

⁵ If the FERC or other appropriate regulatory authorities in North America have already assigned the item to the ISO/RTO Council’s constituent organizations for development of a policy proposal, the Parties may await the policy

whether a specific standards request proposal would itself primarily establish or substantially modify ISO and RTO policy, in which case standards development may be deferred until the FERC or other appropriate regulatory authorities have determined the resolution of such policy issues. Once the JIC has assigned or referred the standards proposal for further development, the members and constituents of the other organizations are strongly encouraged to actively engage in the development process by participating in subcommittee, task force and working group deliberations as well as offering comments and recommendations on any and all aspects of the proposed standard or policy.

2.7 The JIC will make such determinations by the end of the month subsequent to the month in which the annual plan item, standards request proposal or proposed ISO and RTO policy is referred to the JIC. The JIC may prioritize submitted proposals if there are urgent reliability, business, or policy implications.

2.8 All interested individuals and entities are invited and encouraged to participate to the maximum extent possible consistent with membership or registration requirements in NERC, NAESB and the ISO/RTO Council standards development and policy development activity. None of the organizations places any membership or registration requirement on the submission of comments on draft proposed standards or policy development.

2.9 With respect to the provisions of section 2.6, either the determination of the JIC or the resolution reached in the event of a tie vote will become final after thirty days unless, within that thirty-day period, one of the Parties acts to withdraw a standards request proposal. In this event, the proposal may be redrafted and resubmitted to the JIC or the Parties shall meet to attempt to resolve the impasse. Should further consideration not result in a final determination, each of the parties may act consistent with its own standards development or policy definition process. Likewise, with respect to the provisions of section 2.5, a determination of the JIC or the resolution reached in the event of a tie vote will become final after thirty days unless, within that thirty-day period, one of the Parties disagrees with the determination. In this event, the annual plan item may be redrafted and resubmitted to the JIC or the Parties shall meet to attempt to further resolve the issue. Should further consideration not result in a final determination, each of

resolution. In the interim while awaiting the policy resolution, the Parties may identify specific standards activity needed to support any proposed policy resolution.

the parties may act consistent with its own standards development or policy development and implementation process.

2.10 Because the Parties' annual planning processes are iterative and are implemented through or otherwise affect the standards setting processes, the JIC may discuss coordination of ongoing annual plan development and implementation, and each Party, through its JIC members, may make recommendations regarding other Parties' annual plan development and implementation.

3. Filings With Governmental and Regulatory Authorities

3.1 Each Party shall be responsible for making filings with governmental and regulatory authorities as appropriate.

3.2 The Parties agree that all meetings of the JIC will be duly noticed, open and transcribed, and that the JIC's deliberations and all supporting documents, including any minority opinions, will be a matter of public record and may be provided by any Party or any of its members in any filing with governmental authorities of a standard or other issue which the JIC has acted upon.

4. Information Exchange

4.1 Each Party will inform each other party each year of its projected standards development, significant policy development and implementation activities for the coming year and of any additional planned activity as it arises. After exchange of this information, the JIC will meet to address any apparent areas of duplicate or inconsistent effort as soon as practical.

4.2 With respect to each particular initiative regarding an RTO or ISO policy activity, or request for a standard or standard development action, each Party will promptly inform the other Parties of the action, or the request in sufficient detail to convey the subject matter and timeline for resolution of such action or request.

5. Costs

5.1 Each Party shall bear its own costs.

6. Reevaluation

6.1 The Parties agree to meet annually during the anniversary month of the signing of this MOU to evaluate in good faith the effectiveness and efficiency of this MOU in meeting the goal of coordinating the standards and policy development-related activities of the three organizations and to make any appropriate revisions.

6.2 The Parties may also agree to revise this MOU, including the appendices, at any other time as mutually agreeable.

7. Termination

7.1 Each Party may withdraw from this MOU upon 60 days' written notice to the other Parties. Notification of such withdrawal should be provided to the FERC or other appropriate Provincial or state regulatory authorities in North America. Prior to the withdrawal becoming effective, the Parties agree to meet to discuss whether changes to this MOU would address the reasons prompting the withdrawal.

8. Miscellaneous

8.1 Each Party is legally authorized to execute this MOU and to exercise the rights and perform the obligations and responsibilities contained in it.

8.2 This MOU constitutes the entire agreement between the Parties with respect to establishing a coordination process intended to avoid overlap and duplication of effort in the activities of the three organizations by distinguishing ISO and RTO policy-making from the setting of reliability and business practice standards supporting energy markets.

8.3 This MOU may be executed in counterparts each of which shall be deemed an original and all of which together shall constitute one instrument.

8.4 None of the Parties shall be liable for any indirect, special, incidental or consequential damages arising in any way from any performance or failure to perform under this MOU.

8.5 The Parties agree that they will create a process whereby the notice of JIC activities and documents are posted on a web site for public access.

8.6 This is an Amendment and Restatement of the Agreement dated November 30, 2002 between NERC and NAESB.

8.7 Nothing in this Agreement is intended for the benefit of third parties, and no third party may claim for damages or otherwise to enforce any such benefit.

8.8 Nothing in this Agreement shall be construed as establishing a joint venture, agency relationship, any authority of any signatory or the JIC to bind another signatory, or as intending to violate the antitrust laws.

AGREED TO as of this 15th day of May, 2003.

NORTH AMERICAN ENERGY
STANDARDS BOARD

NORTH AMERICAN ELECTRIC
RELIABILITY COUNCIL

By: _____

By: _____

ISO/RTO Council

By: _____

APPENDIX A

JIC Coordination Guidelines

The coordination guidelines for use by the JIC as a starting point, under section 2.6 of the MOU, are based in part upon NERC's Functional Model⁶ and in part upon market criteria developed by NAESB. As the JIC gains more experience alternative coordination guidelines may be developed and used as the JIC sees fit.

In general, the functions identified in the functional model diagrams as "generator" (whether merchant or load-affiliated), "purchasing-selling entity," "load-serving entity," "market operator," "customer aggregator," and certain of the relationships and information flows of "transmission service provider," "transmission owner," and "transmission operator" are associated with how wholesale electric business practices and electronic communication protocols are developed for use by market participants. Additionally, market criteria such as product or service definitions, specifications, and compensation; prerequisites for participation in market and identification of costs and funding obligations; arrangements for product and service delivery to customers; creditworthiness requirements; market-related business practices; market settlement practices; and communication protocols in support of market criteria should be considered. Standards development proposals applicable to those functions and to the relationships and information flows among those functions normally would be assigned to NAESB, regardless of where the original request for the standard was filed.

In general, the functions identified in the functional model diagrams as "reliability authority," "balancing authority," "interchange authority," "compliance monitor," "NERC," and certain of the relationships and information flows of "transmission service provider," "transmission owner," and "transmission operator" are associated with the reliable operation of the bulk power system. Standards development proposals applicable to those functions and to the relationships and information flows among those functions normally would be assigned to NERC, regardless of where the original request for the standard was filed.

⁶ A PowerPoint display of NERC's Functional Model may be downloaded at <http://www.nerc.com/~filez/fmrtg.html>. The Functional Model identifies and defines the functions, associated responsibilities, and the relationships and information flows among those functions, that are necessary for electric systems to operate reliably and for participants in wholesale electricity markets to transact business efficiently, independent of which entities perform which functions.

In general, the functions associated with ISO and RTO policy relate to proposals for and implementation of a definite course of action selected from among alternatives that will guide and determine subsequent material decisions for administering electricity markets and operating regional transmission systems, with the approval of the FERC or other appropriate regulatory authorities in North America. Such policy issues would normally be deferred until the FERC or other appropriate regulatory authorities in North America have exercised their authority to determine such policy issues.

Other factors that may be considered by the JIC in determining the assignment of a particular standards development request to NERC or NAESB include (but are not limited to):

- a. Regulatory direction to one organization or the other;
- b. The priority of the proposal and the ability of either organization to take on and complete the standard development in a timely manner, given its other workload; and
- c. Whether the proposal includes a significant reliability compliance element.

SAR: Coordinate Operations

Title of Proposed Standard:	Coordinate Operations Between Reliability Authorities
Request Date:	March 7, 2002
Authorized for Posting:	March 20, 2002
SAR ID# :	COORD OPERATONS 01 03

SAR Requestor Information		SAR Type (Put an 'x' in front of one of these selections)	
Name:	Jim Byrd (Roger Harsey as substitute)	X	New Standard
Primary Contact	Roger Harsey		Revision to existing Standard
Telephone:	317-249-5400		Withdrawal of existing Standard
e-mail:	Rharszy@midwestiso.org		Emergency Action

Purpose/Industry Need

To ensure that each RA's operations are coordinated such that they will not have an adverse impact on the reliability of other RA's and to preserve the reliability benefits of interconnected operations.

Brief Description

Establish requirements for the coordinated operation between RA's for operational (for current and next day) planning, real-time operations, and maintenance of the interconnected bulk electric system.

This standard will address the following areas:

- Documenting the RA's authority to assist in resolving problems that its caused to another system
- Developing, Maintaining and Sharing Operating Procedures
- Analyzing Maintenance Outages
- Performing Security Analyses
- Performing Generation Resource Availability Analyses
- Sharing Results of Analyses
- Communicating with Others
- Acting with Others

Detailed Description

Requirements shall be developed for the following:

- Develop, Maintain and Share Operating Procedures
 - Operating procedures that address identified potential operating scenarios that may impact neighbor RA's or the Interconnection shall be developed, and distributed to all entities that are expected to take action or that may be impacted as a result of this procedure.
- Analyze Maintenance Outages (real time to 12 months ahead)
 - Analyze the impact of generation outages from a reliability perspective
 - Analyze the impact of transmission outages from a reliability perspective
- Coordinate Reliability Analyses (Generator Resources and Transmission Facilities) (For current and next day and for its impact on other systems)
 - The RA shall coordinate the development of its reliability analyses with other RAs. These analyses shall consider known generation and transmission outages.
 - The RA shall share the results of its system analyses, when conditions¹ warrant, with other RA's, and other involved entities (or upon request, subject to the FERC Code of Conduct and other Confidentiality Agreements)
- Communicate with other impacted RAs to share information:
 - The RA shall communicate with other impacted RAs whenever there is a known potential or actual condition that may adversely affect another RA's Area, such as:
 - A generator or transmission outage will impact another RA
 - Outages of information technology (IT) systems (telemetry, communications, and/or control equipment or other information systems) prevent an RA from performing a reliability analysis of its RA Area or impact the ability of one RA to receive/send data or voice communications to another RA
 - Results of analyses or real-time conditions indicate potential or actual reliability problems
 - Physical or cyber attacks have been threatened or have occurred
- Communicate with other impacted RAs to identify, agree upon, and act or direct others to act to implement solutions to prevent/resolve impending/actual operating problems such as:
 - When interconnection -wide transmission reliability preservation procedures need to be implemented
 - When a reliability problem occurs that requires the initiation/coordination of Operating Procedures or the development of new or temporary procedures.
 - When interconnection frequency is exceeding interconnection frequency limits
 - For prioritization of transmission outages
 - For prioritization of IT outages

The standard shall address appropriate actions when RAs cannot agree upon a solution for an impending or actual problem.

¹ The conditions referenced are those that, if left unattended, could cause instability, uncontrolled separation or cascading outages that adversely impact the reliability of the interconnected bulk transmission system.

Reliability Functions

The Standard will Apply to the Following Functions <i>(Put an 'X' in front of each one that applies)</i>		
X	Reliability Authority	Ensures the reliability of the bulk transmission system within its Security Authority Area. This is the highest reliability authority.
	Balancing Authority	Integrates resource plans ahead of time, and maintains load-interchange-resource balance within its metered boundary and supports system frequency in real time
	Interchange Authority	Authorizes valid and balanced Interchange Schedules
	Planning Authority	Plans the bulk electric system
	Transmission Service Provider	Provides transmission services to qualified market participants under applicable transmission service agreements
	Transmission Owner	Owns transmission facilities
	Transmission Operator	Operates and maintains the transmission facilities, and executes switching orders
	Distribution Provider	Provides and operates the "wires" between the transmission system and the customer
	Generator	Owns and operates generation unit(s) or runs a market for generation products that performs the functions of supplying energy and Interconnected Operations Services
	Purchasing-Selling Entity	The function of purchasing or selling energy, capacity and all necessary Interconnected Operations Services as required.
	Load-Serving Entity	Secures energy and transmission (and related generation services) to serve the end user

Reliability and Market Interface Principles

Applicable Reliability Principles (<i>Put an 'x in front of all that apply</i>)	
X	1. Interconnected bulk electric systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions.
X	2. The frequency of interconnected bulk electric systems shall be controlled within defined limits through the balancing of electric supply and demand
X	3. Information necessary for planning and operation of interconnected bulk electric systems shall be made available to those entities responsible for planning and operating the systems reliably
X	4. Plans for emergency operation and system restoration of interconnected bulk electric systems shall be developed, coordinated, maintained and implemented
X	5. Facilities for communication, monitoring and control shall be provided, used and maintained for the reliability of interconnected bulk electric systems
X	6. Personnel responsible for planning and operating interconnected bulk electric systems shall be trained, qualified and have the responsibility and authority to implement actions
X	7. The security of the interconnected bulk electric systems shall be assessed, monitored and maintained on a wide area basis
Does the proposed Standard comply with all of the following Market Interface Principles?	
<i>(Enter 'yes' or 'no')</i>	
	Yes
1.	Interconnected The planning and operation of bulk electric systems shall recognize that reliability is an essential requirement of a robust North American economy
2.	An Organization Standard shall not give any market participant an unfair competitive advantage
3.	An Organization Standard shall neither mandate nor prohibit any specific market structure
4.	An Organization Standard shall not preclude market solutions to achieving compliance with that Standard
5.	An Organization Standard shall not require the public disclosure of commercially sensitive information. All market participants shall have equal opportunity to access commercially non-sensitive information that is required for compliance with reliability standards

Related SARs

SAR ID	Explanation
COOR_INTERCHNG_01_01	The “Coordinate Interchange” SAR addresses the coordination of data exchange associated with transactions and may have some requirements that interface with the “Coordinate Operations” SAR.
FACILITY_RATINGS_01_01	The “Determine Facility Ratings, Operating Limits, and Transfer Capabilities” SAR identifies how operating limits are established. The operating limits established within this proposed standard will interface with the performance standards within the “Coordinate Operations” SAR.
OPER_WITHN_LMITS_01_01	The “Monitor and Assess Short Term Reliability, Operate Within Limits” SAR identifies requirements for operating within limits in real time and may interface with some of the requirements for the “Coordinate Operations” SAR.
ABNML_&_EM_COND_01_01	The “Prepare for and Respond to Abnormal or Emergency Conditions” SAR identifies requirements for recognizing and responding to emergency conditions and may interface with some of the coordination requirements for the “Coordinate Operations” SAR.
BLACK_ISLD_COND_01_01	The “Prepare for and Respond to Blackout or Island Conditions” SAR identifies requirements for recognizing and responding to blackout or island conditions and may interface with some of the coordination requirements for the “Coordinate Operations” SAR.
BAL_RES_&_DEMND_01_03	The “Balance Resources and Demand” SAR identifies requirements for operating within a defined interconnection frequency limits and may interface with some of the requirements for the “Coordinate Operations” SAR.
DISTURBNCE_COND_01_01	The “Monitor and Analyze Disturbances, Events and Conditions” SAR identifies requirements for monitoring, reporting and analyzing disturbances, events, and conditions and some of the requirements may interface with some of the requirements for “Coordinate Operations” SAR.

Regional/Interconnection Differences

Region	Explanation
ECAR	
ERCOT	
FRCC	
MAAC	
MAIN	
MAPP	
NPCC	
SERC	
SPP	
WECC	

Implementation Plan (Preliminary)

Description
The following sections of Operating Policies should be retired when this standard is implemented: Policy 4. C (all elements) Policy 9: A (all elements) Policy 9.B.1 Policy 9.B.4 Policy 9.C.2 Appendix 9.D. B.1.5 Appendix 9.D.B.1.6 Appendix 9.D.B.1.7

SAR Drafting Team Assignments

<p>Chairman:</p> <ul style="list-style-type: none">- David McNeil, Entergy <p>Secretary:</p> <ul style="list-style-type: none">- Larry Kezele, NERC Staff <p>Requestor:</p> <ul style="list-style-type: none">- Jim Byrd (Roger Harszy, Midwest ISO (Substitute Requestor)) <p>Compliance Representative:</p> <ul style="list-style-type: none">- Stan Kopman, NPCC <p>Industry Representatives:</p> <ul style="list-style-type: none">- Daniel Boezio, AEP- Don Gold, BPA- Tony Jankowski, WE-Energies- Joseph Krupar, FMPA- Ross Owen, Oncor- Jerry Ray, Illinois Power- Gary Rudder, TVA- Greg Tilitson, CAISO

SAR: Coordinate Interchange Transactions

Title of Proposed Standard:	Coordinate Interchange Transactions
Request Date:	March 7, 2002
Authorized for Posting:	March 20, 2002
SAR ID# :	COORD_INTERCHNG_01_04

SAR Requestor Information		SAR Type (Put an 'x' in front of one of these selections)	
Name:	Jim Byrd (Albert DiCaprio as substitute)	X	New Standard
Primary Contact:	(Al DiCaprio)		Revision to existing Standard
Telephone:	610 666-8854		Withdrawal of existing Standard
Fax:			
e-mail:	dicapram@pjm.com		Emergency Action

Notes:

1. The NERC Functional Model has not been finalized. Modifications to the Functional Model may require some conforming changes to this SAR.
2. There is much industry disagreement on the terms used to describe the various stages of coordinating interchange. The SAR DT assembled a series of charts that shows the steps in coordinating interchange. These charts are attached to this SAR and highlight the application of the following terms:
 - Interchange Transaction
 - Interchange Schedule

SAR: Coordinate Interchange Transactions

Purpose/Industry Need (Please see diagram attached)

To ensure that the implementation of Interchange Transactions between Sink and Source Balancing Authorities is coordinated by the Interchange Authority such that the following reliability objectives are met:

- Each Interchange Schedule is checked for reliability before it is implemented
- The Balancing Authorities implement the Interchange Schedule exactly as agreed upon in the Interchange Confirmation process
- Interchange Schedule information is available for reliability assessments

For the purpose of this SAR, the following definitions have been adopted:

- **INTERCHANGE TRANSACTION.** An agreement arranged by a Purchasing-Selling Entity to transfer energy from a seller to a buyer.
- **INTERCHANGE SCHEDULE.** An authorized interchange transaction, approved by all entities, that is implemented (goes physical) between a BA and IA.
- **INTERCHANGE IMPLEMENTATION** - The physical initiation of an approved interchange schedule

Brief Description

To ensure reliability related data pertaining to interchange transactions is verified and communicated to functional authorities. Reliability related data to be verified should include megawatt magnitude, ramp start and stop times, and the interchange transaction's duration. Reliability related data should be communicated by and between the Interchange Authority, Balancing Authority, Reliability Authority, Transmission Service Provider, and Purchasing-Selling Entity functions.

Verification of data should indicate that a mutual agreement exists between parties that intend to implement a proposed interchange transaction as well as approval by the appropriate functional authorities.

To provide a mechanism for interchange transaction identification that could be used for congestion management and/or relieving operating limit violations.

SAR: Coordinate Interchange Transactions

Reliability Functions

The Standard will Apply to the Following Functions <i>(Put an 'X' in front of each one that applies)</i>		
X	Reliability Authority	Ensures the reliability of the bulk transmission system within its Security Authority Area. This is the highest reliability authority.
X	Balancing Authority	Integrates resource plans ahead of time, and maintains load-interchange-resource balance within its metered boundary and supports system frequency in real time
X	Interchange Authority	Authorizes valid and balanced Interchange Schedules
	Planning Authority	Plans the bulk electric system
X	Transmission Service Provider	Provides transmission services to qualified market participants under applicable transmission service agreements
	Transmission Owner	Owns transmission facilities
	Transmission Operator	Operates and maintains the transmission facilities, and executes switching orders
	Distribution Provider	Provides and operates the "wires" between the transmission system and the customer
	Generator	Owns and operates generation unit(s) or runs a market for generation products that performs the functions of supplying energy and Interconnected Operations Services
X	Purchasing-Selling Entity	The function of purchasing or selling energy, capacity and all necessary Interconnected Operations Services as required.
	Load-Serving Entity	Secures energy and transmission (and related generation services) to serve the end user

SAR: Coordinate Interchange Transactions

Reliability and Market Interface Principles

Applicable Reliability Principles (Put an 'x' in front of all that apply)	
X	1. Interconnected bulk electric systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions
X	2. The frequency of interconnected bulk electric systems shall be controlled within defined limits through the balancing of electric supply and demand
X	3. Information necessary for planning and operation of interconnected bulk electric systems shall be made available to those entities responsible for planning and operating the systems reliably
	4. Plans for emergency operation and system restoration of interconnected bulk electric systems shall be developed, coordinated, maintained and implemented
X	5. Facilities for communication, monitoring and control shall be provided, used and maintained for the reliability of interconnected bulk electric systems
	6. Personnel responsible for planning and operating interconnected bulk electric systems shall be trained, qualified and have the responsibility and authority to implement actions
X	7. The security of the interconnected bulk electric systems shall be assessed, monitored and maintained on a wide area basis
Does the proposed Standard comply with all of the following Market Interface Principles?	
<i>(Enter 'yes' or 'no')</i>	
	Yes
1.	Interconnected The planning and operation of bulk electric systems shall recognize that reliability is an essential requirement of a robust North American economy
2.	An Organization Standard shall not give any market participant an unfair competitive advantage
3.	An Organization Standard shall neither mandate nor prohibit any specific market structure
4.	An Organization Standard shall not preclude market solutions to achieving compliance with that Standard
5.	An Organization Standard shall not require the public disclosure of commercially sensitive information. All market participants shall have equal opportunity to access commercially non-sensitive information that is required for compliance with reliability standards

SAR: Coordinate Interchange Transactions

Detailed Description: This standard will include requirements for the exchange of reliability-related data pertaining to Interchange Transactions.

The standard shall contain the following requirements for the BA:

- BA shall confirm (with the IA) its approval or denial of the requested Interchange Schedule
- BAs shall implement Interchange Schedules exactly as agreed upon in the interchange confirmation process

The standard shall contain the following requirements for the IA:

- The IA shall confirm the approvals from all involved parties (RAs, BAs, TSPs) and shall authorize, upon confirming approvals, the implementation of Interchange Schedules
- The IA shall confirm that Interchange Transactions are balanced and valid prior to physical delivery
- The IA shall communicate implementation status to all parties (with which the Interchange Transaction must be coordinated)

The standard shall contain the following requirements for the RA:

- The RA shall receive and confirm Interchange Transaction information with the IA
- The RA shall approve or deny the request from the IA based on reliability perspectives.

The standard shall contain the following requirements for the TSP:

- TSP shall receive and confirm Interchange Transaction information with the IA
- The TSP shall approve or deny the request from the IA

The standard shall contain the following requirements for the PSE:

- When an entity desires to transfer energy, the entity initiating the transaction shall submit, as a minimum, the following reliability-related transaction data to its IA:
 - Desire to transfer energy
 - Megawatt magnitude
 - Ramp start and stop times
 - Interchange transaction's duration
 - Sufficient information for all approval entities
- The PSE shall request approval for interchange transactions from the IA
- The PSE shall confirm interchange transaction requirements with the IA

SAR: Coordinate Interchange Transactions

Related Standards

Standard No.	Explanation

Related SARs

SAR ID	Explanation
BAL_RES_&_DEMND_01_03	The “Balance Resources and Demand” SAR identifies requirements matching resources with demand. Some of the data required to ensure “balance” comes from transactions and is referenced in this Coordinate Interchange SAR.
OPER_WITHN_LMTS_01_02	The “Operate Within Transmission Limits – Monitor and Assess Short Term Reliability” SAR includes requirements that the RA monitor the overall reliability of the RA Area. This includes the requirement that data be collected and analyzed to ensure security. Some of the data collected for security analyses is included in this Coordinate Interchange SAR.
COORD_OPERATONS_01_01	The “Coordinate Operations” SAR may include requirements such as entering data into the IDC. The data for this comes from Interchange.
ABNML_&_EM_COND_01_01	The “Prepare for and Respond to Abnormal or Emergency Conditions” SAR identifies requirements for recognizing and responding to emergency conditions. Some emergencies may involve curtailment of interchange schedules.

Regional/Interconnection Differences

Region	Explanation
ECAR	none
ERCOT	ERCOT: As a single Control Area (Balancing Authority) interconnection there are no true Interchange Schedules in ERCOT. The only Interchange is over DC ties, which will have unique requirements. Oncor: ERCOT has an Interconnection Difference by Legislative direction for retail choice. There are no transmission reservations requirements and generation/load schedules are part of the real-time competitive market.
FRCC	none
MAAC	none
MAIN	none
MAPP	none
NPCC	none
SERC	none
SPP	none
WECC	none

SAR: Coordinate Interchange Transactions

Implementation Plan

Description (Preliminary.)

Portions of Policy 3 will be deleted when this SAR is implemented. Policy 3 contains some procedures that may need to be transformed from Policies into commercial practices or supporting documents in concert with the implementation of this new standard.

Team Assignments

“Coordinate Interchange” SAR Drafting Team

Chairman: Doug Hils

Secretary/Facilitator: Gordon Scott

Requestor: Jim Byrd (Albert DiCaprio as substitute)

Industry Representatives:

Diane Barney

Linda Clarke

Jim Cyrulewski

Nick Henery

Carolyn Ingersoll

Adrian Malo

Dave McGinnis

David McRee

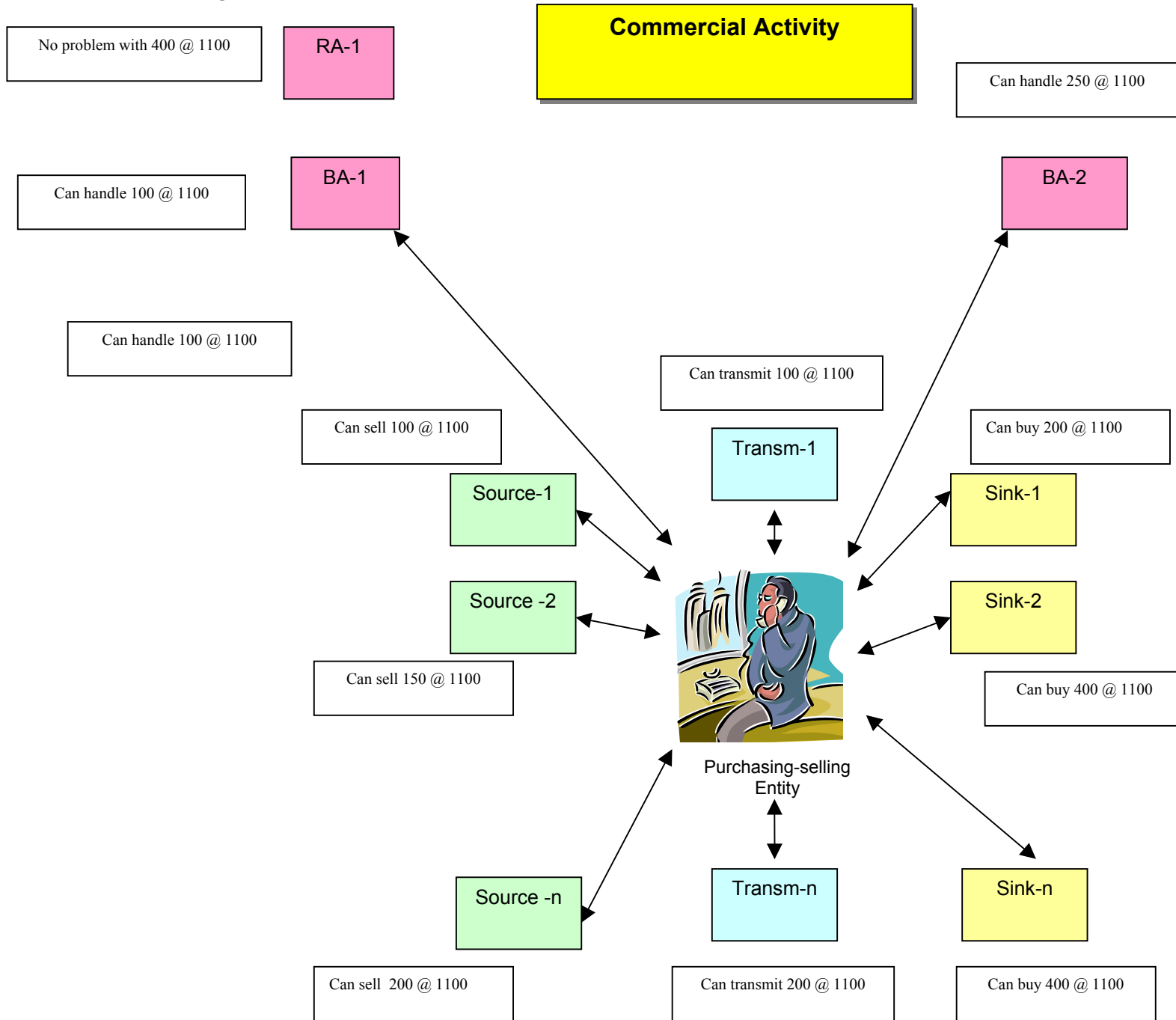
Jim McIntosh

Joel Mickey

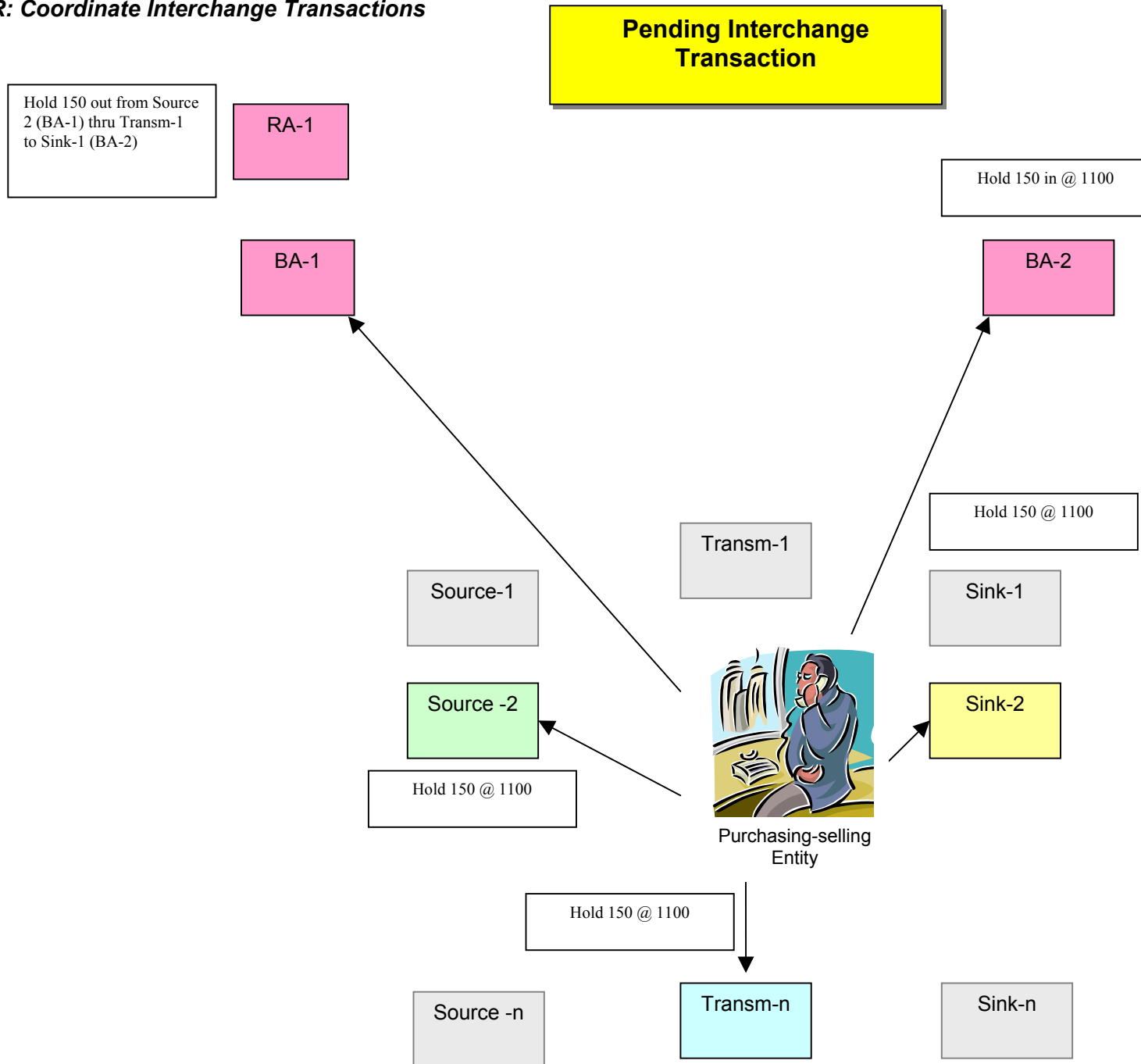
Monroe Landrum

Charles Yeung

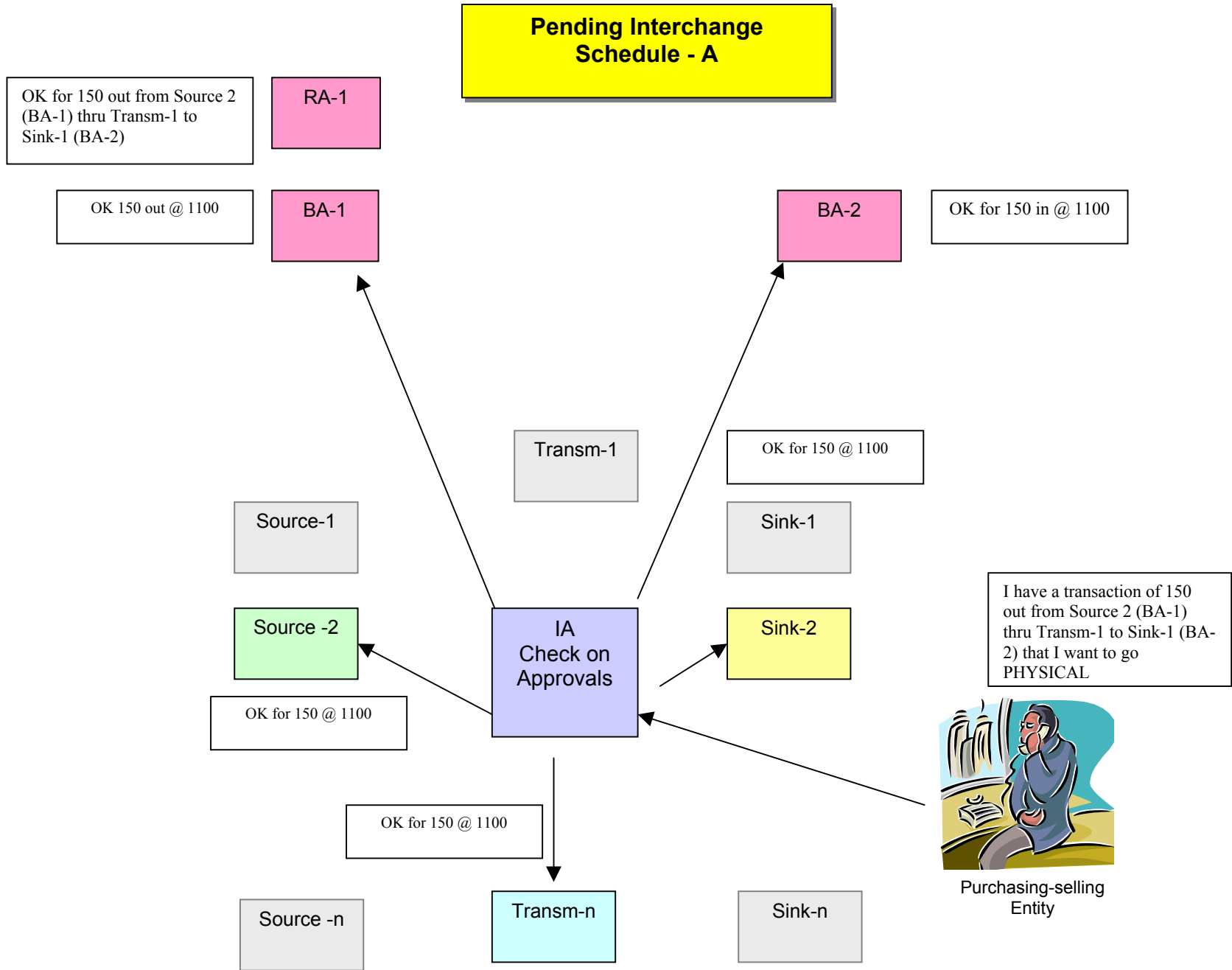
SAR: Coordinate Interchange Transactions



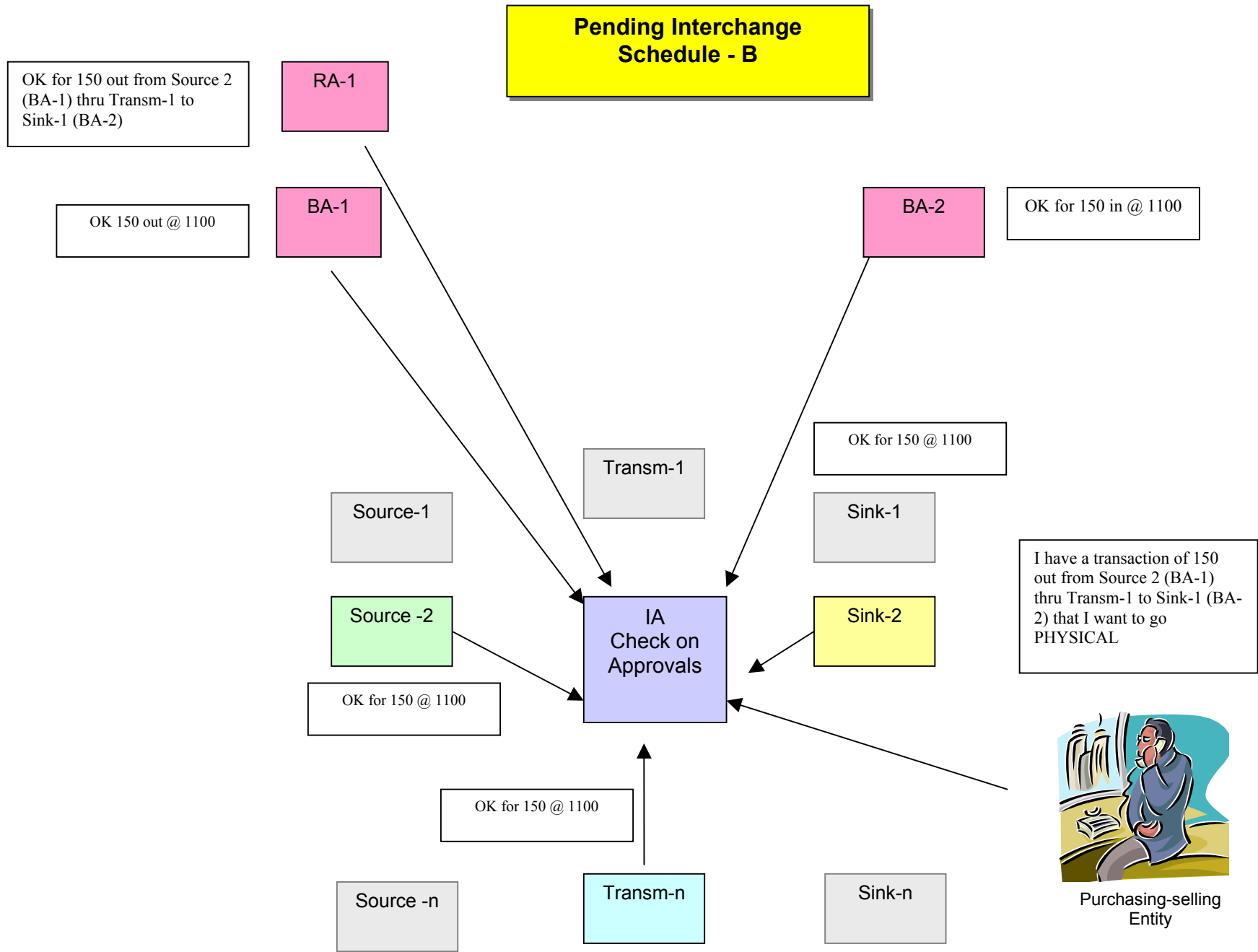
SAR: Coordinate Interchange Transactions



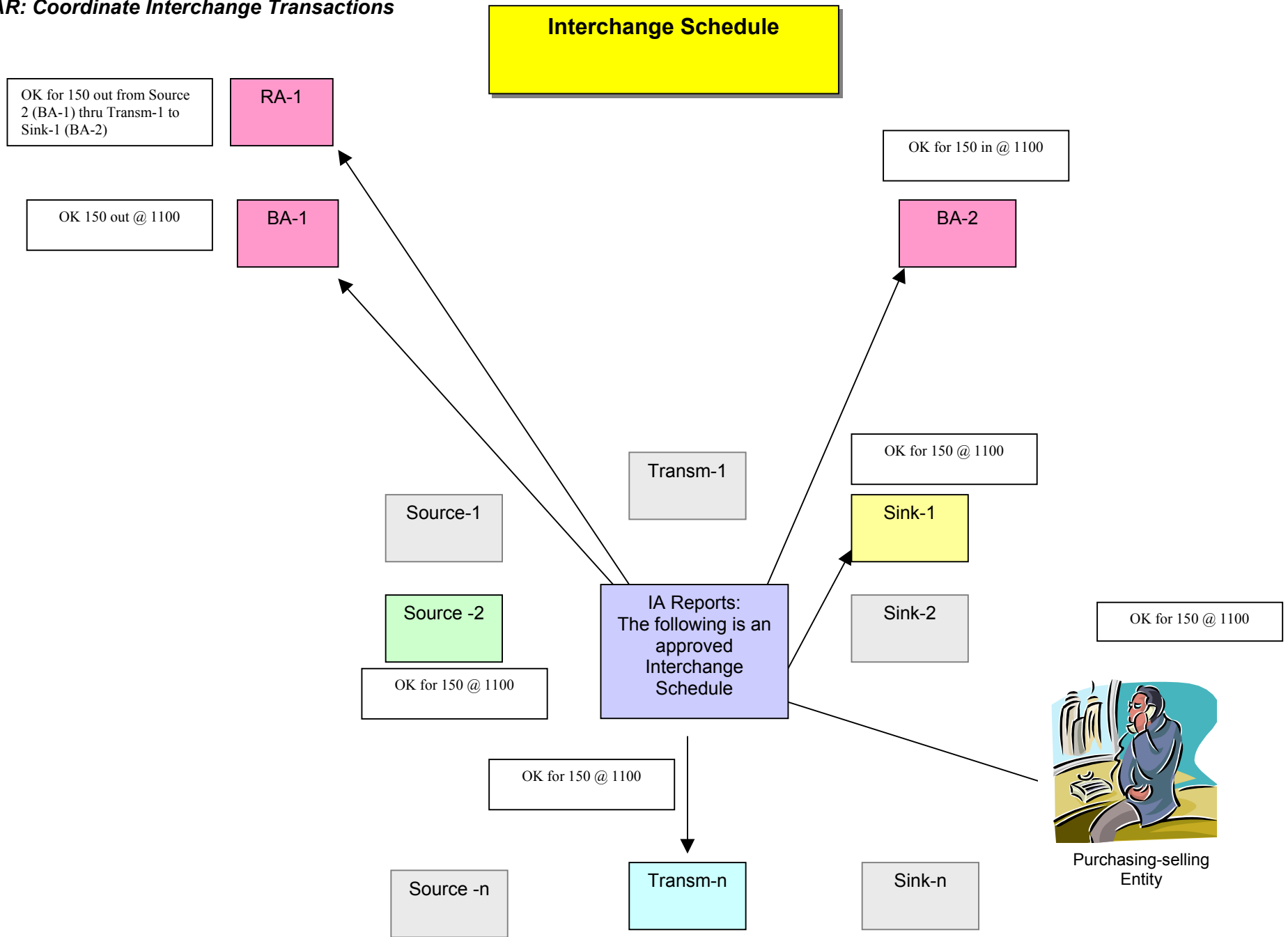
SAR: Coordinate Interchange Transactions

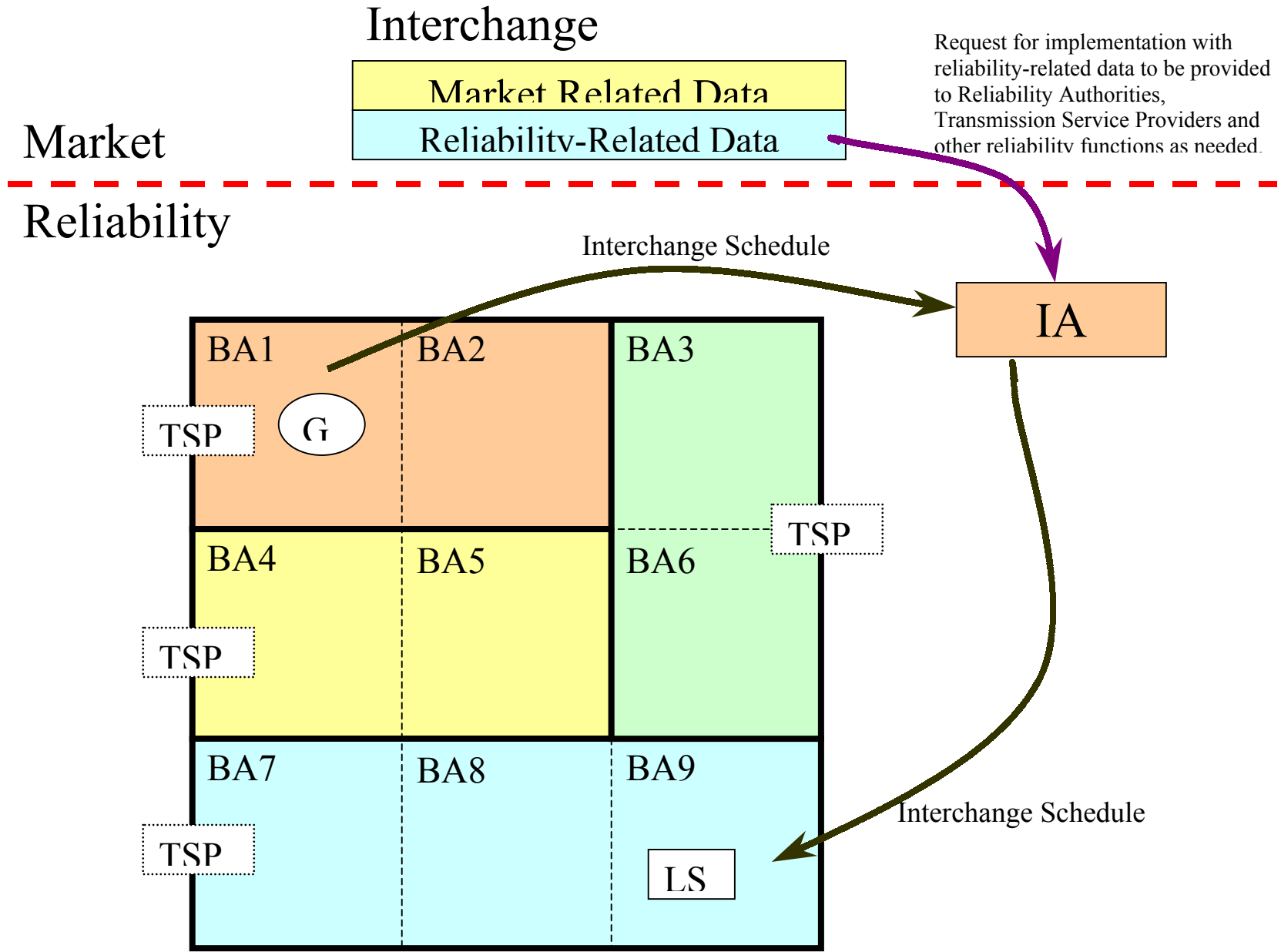


SAR: Coordinate Interchange Transactions



SAR: Coordinate Interchange Transactions





Charles Yeung, Reliant Energy Comments on Coordinate Interchange SAR
5-9-2003

The Coordinate Interchange SAR is on its way to set criteria for the standards drafting team to develop a NERC Reliability Standard that meets NERC's mission and its adopted Reliability and Market Interface Principles. The separation of the market issues from the Reliability Standard is of key importance because it allows for other organizations to develop the appropriate market requirements. However, in doing so, a level of consistency and standardization for the Interconnections may be lost. It is not in NERC's purview to develop or influence market standards, but the industry must be made aware that the CI Reliability Standard will leave it up to others to address the issue of scheduling requirements for seamless markets.

Excerpt from the CI SAR:

The standard shall contain the following requirements for the BA:

- BA shall confirm (with the IA) its approval or denial of the requested Interchange Schedule
- BAs shall implement Interchange Schedules exactly as agreed upon in the interchange confirmation process

The standard shall contain the following requirements for the PSE:

- *When an entity desires to transfer energy to another BA's area, the entity initiating the transaction shall submit as a minimum the following reliability-related transaction data to its IA:*
 - *Desire to transfer energy to another BA's area*
 - *Megawatt magnitude*
 - *Ramp start and stop times*
 - *interchange transaction's duration*
 - *Sufficient information for all approval entities*
- The PSE shall request approval for interchange transactions from the IA
- The PSE shall confirm interchange transaction requirements with the IA

What is NOT a part of this Standard?

The "Implementation" part of the SAR refers to the exclusion of certain requirements of Policy 3 from the Standard. Inadvertent Energy Payback was identified early in the process as not a NERC standard and allocated to NAESB for development. Are there other elements of interchange that should also be allocated to NAESB or RTOs for definition?

Market procedures for requesting/submitting transaction information – ala PJM, MISO are believed to be NOT a part of the CI Standard. Is the SAR language clear that these markets will not be subject to requirements in the CI Standard that "mandates or prohibits

any given market structure?” - one of the Market Interface Principles referred to in the SAR form that is assumed to be complied with.

The future standard on Coordinate Interchange should differ from the current Policy 3 Standard which describes interchange transaction request submission, revision, modification procedures (embodied in the various Policy 3 Appendixes). The new standard seems to delegate those procedures and data requirements to regional markets to develop.

This raises an important issue regarding standardization of practices to enable inter-Regional markets. By divorcing NERC from developing market standards, the ability for a NERC Standard to enable a seamless market is lost. The present NERC Policy 3 tagging requirements has established a level of market consistency for the Eastern Interconnection and recently, the Western Interconnection. This level of consistency may be lost with the new CI Standard.

A diversity of market procedures for the request for inter-regional energy transfers may result due to the emergence of RTOs and the differences in market rules. Without a centralized standard procedure for the handling of bi-lateral transaction requests and implementation, the PSEs conducting business across regional boundaries may be faced with a plethora of data and timing requirements. This would disrupt the market’s ability to seamlessly transact business between transmission providers that do not operate under a single market.

The Answer is Coordination

With the assumption that the CI Standard will not specify the market processes to request energy transfers, NERC must define and standardize the core and fundamental required technical information for reliability in such a manner that all markets, regardless of structure, will be able to comply. Since NERC is divorced from developing market standards, it cannot play a direct role in market standards development. Instead, NERC must inform the industry that this need exists. Organizations chartered to develop market rules should carry on the burden of developing market requirements that can enable seamless transactions.