

## Assignments per July 8, 2003 Seams Task Force Meeting

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## Seams Issues Matrix

# Category	Description of Seam Issue	Seam Interface Type	Region 1	Region 2	Seam Impediment Type	Currently Being Addressed ?	Submitter	Reference Papers	Comments
1 General Data / Procedures	Non Standard Time Zone	All	All	All	Market Rule / Business Practice	No	Phil Cox - AEP	No	The lack of a standard Time Zone causes Market Inefficiencies
2 Transmission	MaxGen/MaxLoad 345Kv	Other	ECAR	ECAR	Physical	No	Phil Cox - AEP	No	Undersized Transmission Line
3 Products / Services	Definition & treatment of Firm/nonfirm Power	All	All	All	Market Rule / Business Practice	No	Lou Oberski - Dominion Energy	No	Annual Plan Item 4ci moved from MOS
4 Transmission	Definition & treatment of Firm/nonfirm Transmission	All	All	All	Market Rule / Business Practice	No	Lou Oberski - Dominion Energy	No	Annual Plan Item 4cii moved from MOS
5 Transmission / Generation	Provision of reserves across multiple control areas	All	All	All	Market Rule / Business Practice	No	Lou Oberski - Dominion Energy	No	Annual Plan Item 4cii moved from MOS
6 Transmission	Transmission Access	All	Non-RTO Market	Non-RTO Market/ISO Market	Market Rule/Business Practice	Yes - Various Transmission Providers	Steven Cobb - SRP	No	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.
7 Settlements	Market Price Information	Non-RTO Mkt to Non-RTO Mkt	Non-RTO Market	Non-RTO Market	Market Rule/Business Practice	No	Steven Cobb - SRP	No	Market pricing methodology not comprehensive, consistent or dependable. Solution: Standardized Indices, Independently Managed.
8 Scheduling	Scheduling	RTO Market to Non-RTO Market	Non-RTO Market	ISO Market	Market Rule/Business Practice	Yes - SSG - WI	Steven Cobb - SRP	No	Inconsistent procedures among entities. Solution: Western Interconnection Standardized Interchange Scheduling Protocols.
9 Transmission	Transmission Calculations	All	Non-RTO Market	Non-RTO Market/ISO Market	Market Rule/Business Practice	Yes - SSG - WI	Steven Cobb - SRP	No	Transmission calculations are not consistent. Solution: Standardized TTC & ATC Calculations.
10 Products	Energy Products	All	Non-RTO Market	Non-RTO Market/ISO Market	Market Rule/Business Practice	Yes - WECC	Steven Cobb - SRP	No	Entities have disagreements concerning the definitions of various energy products. Solution: Standardized Energy Products.
11 Compliance	Market Oversight	All	Non-RTO Market/ISO Market	Non-RTO Market/ISO Market	Market Rule/Business Practice	Yes - SSG - WI	Steven Cobb - SRP	No	New and mature markets need oversight to ensure that existing rules are complied with and new rules are adequate in meeting the scenarios they were designed to govern. Solution: Independent Market Auditor or Monitor.
12 Scheduling	Interchange/Intrachange Scheduling Data Exchange	All	Non-RTO Market/ISO Market	Non-RTO Market/ISO Market	Market Rule/Business Practice	Yes -WECC	Steven Cobb - SRP	No	Current E-Tagging process is inadequate for exchanging reliability and market data within the Western Interconnection. Solution: Electronic Scheduling
13 Settlements	Compensation for Unscheduled Flows of Electricity	All	All	All	Market Rule / Business Practice and Physical	Yes / IIPTF	Mark Lively - Lively Utility	A - C	Lack of compensation lessens incentives for operators to solve problems and for accountants to spend money on metering.
14 Settlements	Compensation for Inadvertent Interchange	All	All	All	Market Rule / Business Practice and Physical	Yes / IIPTF	Mark Lively - Lively Utility	A - C	Lack of compensation lessens incentives for operators to solve problems and for accountants to spend money on metering.
15 Settlements	Compensation for Loop Flow	All	All	All	Market Rule / Business Practice and Physical	Yes / IIPTF	Mark Lively - Lively Utility	A - C	Lack of compensation lessens incentives for operators to solve problems and for accountants to spend money on metering.
16 Settlements	Compensation for Reactive Power	All	All	All	Market Rule / Business Practice and Physical	Yes / IIPTF	Mark Lively - Lively Utility	A - C	Lack of compensation lessens incentives for operators to solve problems and for accountants to spend money on metering.
17 ATC	TTC-ATC calculation/posting	Other	HQ TransÉnergie	IMO	Market Rule / Business Practice	No	Victor Bissonnette - HQ TransÉnergie	No	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

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18 ATC	TTC-ATC calculation/posting	Other	HQ TransÉnergie	NYiso	Market Rule / Business Practice	No	Victor Bissonnette - HQ TransÉnergie	No	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
19 ATC	TTC-ATC calculation/posting	Other	HQ TransÉnergie	ISO-NE	Market Rule / Business Practice	No	Victor Bissonnette - HQ TransÉnergie	No	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
20 Capacity	TTC coordination	Other	HQ TransÉnergie	NYiso	Market Rule / Business Practice	Yes	Victor Bissonnette - HQ TransÉnergie	No	Disagreement between two operators on the physical capability of an interconnection (line 7040)
21 Capacity	TTC coordination	Other	HQ TransÉnergie	ISO-NE	Market Rule / Business Practice	Yes	Victor Bissonnette - HQ TransÉnergie	No	Disagreement between two operators on the physical capability of an interconnection (Phase II)
22 Settlements	Rate pancaking elimination	All	All	All	Market Rule / Business Practice	Yes	Linda Horn - WE Energies	No	Being reviewed by PJM/MISO.
23 Congestion Management	How different congestion management methodologies will interact to ensure parallel flows and impacts are recognized and controlled to ensure system reliability.	All	All	All	Physical	Yes	Linda Horn - WE Energies	No	Being reviewed by PJM/MISO.
24 Flow Analysis	Improve Real Time use of transmission interfaces - regional dispatch coordination	All	All	All	Market Rule / Business Practice	Yes	Linda Horn - WE Energies	No	Being reviewed by PJM/MISO.
25 Products	Need for common market and products and definitions	All	All	All	Market Rule / Business Practice	No	Linda Horn - WE Energies	No	
26 Planning / Congestion Management	Transmission expansion planning - coordination between systems and determine who is obligated to build and pay for improvements	All	All	All	Market Rule / Business Practice	Yes	Linda Horn - WE Energies	No	Being reviewed by PJM/MISO.
27 ATC	ATC/AFC Coordination	All	All	All	Market Rule / Business Practice	Yes	Linda Horn - WE Energies	D	Being reviewed by PJM/MISO. See PJM presentation "Status Report to FERC on July 31, 2002 Alliance Order" dated Jan 2003, page 6 as posted under NAESB WEQ Seams subcommittee July 8 date
27 Capacity	Contract Tie Capacity	All	All	All	Market Rule / Business Practice	Yes	Linda Horn - WE Energies	D	Being reviewed by PJM/MISO. See PJM presentation "Status Report to FERC on July 31, 2002 Alliance Order" dated Jan 2003, page 6 as posted under NAESB WEQ Seams subcommittee July 8 date
27 General Data / Procedures	Definitions and Procedures	All	All	All	Market Rule / Business Practice	Yes	Linda Horn - WE Energies	D	Being reviewed by PJM/MISO. See PJM presentation "Status Report to FERC on July 31, 2002 Alliance Order" dated Jan 2003, page 6 as posted under NAESB WEQ Seams subcommittee July 8 date
27 Planning	Access/Expansion Planning	All	All	All	Market Rule / Business Practice	Yes	Linda Horn - WE Energies	D	Being reviewed by PJM/MISO. See PJM presentation "Status Report to FERC on July 31, 2002 Alliance Order" dated Jan 2003, page 6 as posted under NAESB WEQ Seams subcommittee July 8 date
27 Transmission	Voltage Operating Procedures	All	All	All	Market Rule / Business Practice	Yes	Linda Horn - WE Energies	D	Being reviewed by PJM/MISO. See PJM presentation "Status Report to FERC on July 31, 2002 Alliance Order" dated Jan 2003, page 6 as posted under NAESB WEQ Seams subcommittee July 8 date
27 Transmission	Outage Maintenance Coordination	All	All	All	Market Rule / Business Practice	Yes	Linda Horn - WE Energies	D	Being reviewed by PJM/MISO. See PJM presentation "Status Report to FERC on July 31, 2002 Alliance Order" dated Jan 2003, page 6 as posted under NAESB WEQ Seams subcommittee July 8 date
27 Transmission/Congestion Management	Congestion - Transmission Allocation	All	All	All	Market Rule / Business Practice	Yes	Linda Horn - WE Energies	D	Being reviewed by PJM/MISO. See PJM presentation "Status Report to FERC on July 31, 2002 Alliance Order" dated Jan 2003, page 6 as posted under NAESB WEQ Seams subcommittee July 8 date
28 Settlements	Multiple transmission service charge invoicing	All	All	All	Market Rule / Business Practice	Yes	Linda Horn - WE Energies	No	Being reviewed by PJM/MISO.
29 Transmission/Congestion Management	Allocation of transmission capacity on reciprocal flow gates amounts to transmission service without compensation. Legitimizes "parallel loop flow".	RTO Market to RTO Market	MISO	PJM	Market Rule / Business Practice		Dave Nick - DTE Energy	E	

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30 Capacity / Allocation	Market allocations over flow gates are approved without regard to flow gate capacity resulting in over subscription of flow gates.	RTO Market to RTO Market	MISO	PJM	Market Rule / Business Practice		Dave Nick - DTE Energy	E	
31 Flow Analysis	MISO- PJM will do their own flowgate contribution analysis and send to NERC IDC if the 5% threshold is exceeded for an individual generator. IDC will not have complete information.	RTO Market to RTO Market	MISO	PJM	Market Rule / Business Practice		Dave Nick - DTE Energy	E	
32 Capacity / Allocation	MISO- PJM market allocation will give preference to the market as Network over PTP even though the Market allocation may be a non paying transmission customer.	RTO Market to RTO Market	MISO	PJM	Market Rule / Business Practice		Dave Nick - DTE Energy	E	
33 Products / Services	Standard for Purchasing of Interhour Transmission	All	All	All	Market Rule / Business Practice	No	Tony Reed - Southern	No	The ability to purchase transmission after the top of the hour when the transmission service is predetermined as available in prior hour.
34 Products	Clarification of Product Definitions	All	All	All	Market Rule / Business Practice	No	Tony Reed - Southern	No	Complete/Standard definitions for Liquidated Damages (LD), "Into", etc.
35 Settlements	LMP prices at borders of RTOs with markets	RTO Market to RTO Market	All RTOs with market	All RTOs with market	Market Rule / Business Practice		Raj Rana - AEP	No	
36 Congestion Management/ Products	Coordination of market based congestion hedging instruments, such as FTRs, between adjacent RTOs with markets, especially for out and thru' transactions	RTO Market to RTO Market	All RTOs with market	All RTOs with market	Market Rule / Business Practice		Raj Rana - AEP	No	
38 Settlements	Rate Pancaking	All	NYISO	RTO	Market Rule / Business Rule	Yes	Marjorie Perlman - Energy East	No	Charges to Market Participants who conduct business over more than one RTO. Reciprocal agreements needed to eliminate these charges. NYISO and ISO-NE
39 Scheduling	Controllable Line Scheduling	All	NYISO	RTO	Market Rule / Business Rule	Yes	Marjorie Perlman - Energy East	No	Concept of operations for general methodology to schedule controllable lines between RTOs. Being reviewed by NYISO
40 Transmission	Multiple Proxy Buses for Free Flowing Interfaces	All	NYISO	RTO	Market Rule / Business Rule	Yes	Marjorie Perlman - Energy East	No	Development of multiple proxy buses between RTOs for scheduling and pricing.
41 Scheduling / Ramping	Scheduling of Load	All	NYISO	RTO	Market Rule / Business Rule	Yes	Marjorie Perlman - Energy East	No	RTOs have different ramp rates and scheduling requirements that require Market Participants to complete multiple submissions for the same transaction.
42 General Data / Procedures	Data Visibility	All	NYISO	RTO	Market Rule / Business Rule	Yes	Marjorie Perlman - Energy East	No	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.
43 Capacity	Allow Sharing Contract Tie Capacity between Entities across Seams	All	All	All	Market Rule / Business Practice	Limited	Carl Monroe, Southwest Power Pool	No	Lack of Coordination and Sharing of Tie Capacity is an artificial market barrier
44 Capacity	Calculation and Values of TRM and CBM consistent	All	All	All	Market Rule / Business Practice	Limited	Carl Monroe, Southwest Power Pool	F	Underutilization of Transmission Capacity
45 Transmission/ Generation	Coordination of Transmission and Generation Outages	All	All	All	Physical	Limited	Carl Monroe, Southwest Power Pool	No	Both forced and planned outages
46 Generation	Generation Interconnection Studies	All	All	All	Physical	Limited	Carl Monroe, Southwest Power Pool	No	Generation Interconnections close to seam affects both areas
47 General Data / Procedures	Operational Model Updates	All	All	All	Physical	Limited	Carl Monroe, Southwest Power Pool	No	Areas must have up to date models for operational use of other areas across the seam
48 General Data / Procedures	Communication of Computer Failures	All	All	All	Physical	Limited	Carl Monroe, Southwest Power Pool	No	Needed for reliable operations and emergency operations

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49 General Data / Procedures	Emergency Procedures	All	All	All	Physical	Limited	Carl Monroe, Southwest Power Pool	No	Emergency procedures require operations across seams
50 Scheduling / Ramping	Schedule Ramp Management	All	All	All	Market Rule / Business Practice	Limited	Carl Monroe, Southwest Power Pool	No	Ramping standard differences across the seams hinder business
51 Transmission/ Generation	Resource Adequacy	All	All	All	Physical	Limited	Carl Monroe, Southwest Power Pool	No	Parties in one area rely on resources in other areas. Validation of their reliance on the other area must be coordinated.
52 General Data / Procedures	Confidentiality of Data and Information Shared	All	All	All	Market Rule / Business Practice	Limited	Carl Monroe, Southwest Power Pool	No	Standards of Confidentiality would enhance the capability to resolve data sharing and information posting
53 Scheduling	CAISO ETC rights scheduling - Contract Reference Number	CAISO Market to Non CAISO market	Non ISO market	CAISO market	Market rule/Business practice/ CAISO software	No	Robert D. Schwermann - SMUD	No	CAISO uses Contract Numbers to track ETC rights. This causes Phantom Congestion and does not allow ETC rights holders to sell and schedule their transmission
54 Products / Transmission	Transmission service charge discounting	RTO Market to RTO Market	ISO New England	NY ISO		Northeast ISO	Joe Rossignoli - National Grid	G	Ability for TOs to discount TSC rates on external interfaces to selectively reduce export charges and encourage use of ties. The software exists, however, there does not appear to be any business incentives to exercise discounts.
55 ATC	Improved TTC/ATC posting	RTO Market to RTO Market	ISO New England	NY ISO		Northeast ISO	Joe Rossignoli - National Grid	G	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.
56 Products	Multiple transmission service charge invoicing	RTO Market to RTO Market	ISO New England	NY ISO		Northeast ISO	Joe Rossignoli - National Grid	G	Companies that conduct business across Control Area borders are faced with receiving a TSC bill from each TO. A single charge should be provided to each transaction to the appropriate parties and revenues allocated to the TOs according to the appropriate usage formulas.
57 Transmission	Transmission interconnection procedures	RTO Market to RTO Market	ISO New England	NY ISO		Northeast ISO	Joe Rossignoli - National Grid	G	Need consistent approach to treating merchant transmission interconnection agreement and procedures among the ISOs.
58 Scheduling	Controllable line scheduling	RTO Market to RTO Market	ISO New England	NY ISO		Northeast ISO	Joe Rossignoli - National Grid	G	Concept of Operations for general methodology to schedule controllable lines has been drafted. A multi-ISO stakeholder group (similar to JCAG) needs to be formed to review the draft Concept of Operations to provide stakeholder input.
59 Congestion Management	Inter-control area congestion management / parallel flow management	RTO Market to RTO Market	ISO New England	NY ISO		Northeast ISO	Joe Rossignoli - National Grid	G	Develop congestion hedges across control area boundaries.
60 Settlements	Cross-border price convergence	RTO Market to RTO Market	ISO New England	NY ISO		Northeast ISO	Joe Rossignoli - National Grid	G	The lack of price convergence at the control area boundaries may inhibit the desire of market participants to arbitrage between neighboring markets. This issue is being referred to the individual ISO Market Committees for further definition on the business issue that needs resolution.
61 Transmission	Market Design - Prior to Day Ahead. Congestion Revenue Rights (CRRs) [Firm Transmission Rights (FTRs) in MD02, FTOs in RTO West]				Fundamental approach -- financial hedging and scheduling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Are all transmission rights both physical and financial required to be identical to mitigate the seams problems? (Issue #1.a.2)
62 Congestion Management	Market Design - Prior to Day Ahead. Financial or Physical				Fundamental approach -- financial hedging and scheduling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Must the offerings be identical? How can congestion management discontinuities be mitigated? (Issue 1.a.3)
63 Products	Market Design - Prior to Day Ahead. Option or Obligation				Fundamental approach -- financial hedging and scheduling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Do different CM models create barriers to trade, and if so, how can these differences be mitigated? (Issue 1.a.4)
64 Congestion Management / Products	Market Design - Prior to Day Ahead. Revenue Stream/ or Offset CM Cost				Fundamental approach -- financial hedging and scheduling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Must the term of congestion offerings be identical? How can congestion management discontinuities be mitigated? (Issue 1.a.5)
65 Products	Market Design - Prior to Day Ahead. Duration				Fundamental approach -- financial hedging issue.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	To the extent that longer term transmission rights are needed for new construction, can agreement be reached to issue long term rights? (Issue 1.a.6)

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66 Products	Market Design - Prior to Day Ahead. Duration				Fundamental approach -- financial hedging issue.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	How will rights for loop flows (non-contract flows) in other RTOs be allocated/acquired? (Issue I.a.7)
67 Uncategorized	Market Design - Prior to Day Ahead. Primary Release Mechanism				Fundamental approach -- financial hedging issue.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	There seems to be agreement here that a secondary market would be outside the RTO. If the resulting secondary market is not westwide, will coordination be needed? (Issue I.a.8)
68 Congestion Management / Products	Market Design - Prior to Day Ahead. Secondary Market				Fundamental approach -- financial hedging issue.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	To the extent that at a minimum congestion redispatch occurs in an RTO (i.e. a limited energy market), can a method be developed to produce consistent prices at the boundaries? If not, can price discontinuities be tolerated or managed? (Issue I.b.1)
69 Planning	Market Design - Day Ahead. Energy Spot Market				Market issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	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)
70 Planning	Market Design - Day Ahead. Congestion Management Market				Modeling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	If models with identical levels of detail for the West are not used by all three RTOs, do the various simplifications for areas outside any given RTO create problems in achieving a uniform set of redispatch prices? (Issue I.b.3)
71 Scheduling	Market Design - Day Ahead. Model spatial granularity				Modeling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	To what extent do RTOs need to see other RTOs' scheduling information? (Issue I.b.4)
72 Congestion Management	Market Design - Day Ahead. Model spatial granularity				Market issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	To the extent that at a minimum congestion redispatch occurs in an RTO (i.e. a limited energy market), can a method be developed to produce consistent day ahead prices at the boundaries? (Issue I.b.5)
73 Scheduling	Market Design - Day Ahead. Model objective function				Modeling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	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)
74 Products / Services	Market Design - Day Ahead. Model objective function				Financial approach -- scheduling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	What is the effect of linking energy and ancillary service markets in the optimizations on model coordination issues? (Issue I.b.7)
75 Generation	Market Design - Day Ahead. Model objective function				Modeling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Does the use of both AC and DC OPFs introduce compatibility problems? (Issue I.b.8)
76 Scheduling	Market Design - Day Ahead. Model objective function				Modeling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	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)
77 Scheduling	Market Design - Day Ahead. Schedule Components				Financial approach -- scheduling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Will different RTO congestion management systems enhance opportunities for gaming or affect generation dispatch efficiency? (Issue I.b.10)
78 Scheduling	Market Design - Day Ahead. Schedule Components				Financial approach -- scheduling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Can tools be developed for scheduling submission that assist the user in meeting any differences in protocols between RTOs? (Issue I.b.11)
79 Uncategorized	Market Design - Day Ahead. Other Scheduling Requirements				Financial approach -- scheduling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Should the time intervals and submission times be synchronized to mitigate obstacles to inter-RTO trade? (Issue I.b.12)
80 Scheduling	Market Design - Day Ahead. Other Scheduling Requirements				Financial approach -- scheduling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	To the extent that at a minimum congestion redispatch occurs in an RTO (i.e. a limited energy market), can a method be developed to produce consistent prices at the boundaries that send the same signal to the market? If not, can price discontinuities be tolerated or managed? (Issue I.b.13)
81 Products / Services	Market Design - Day Ahead. Congestion Prices.				Market issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Can a "best practice" model for definition and acquisition of ancillary services products be developed to produce consistent prices at the RTO boundaries? (Issue I.b.14)
82 Scheduling	Market Design - Day Ahead. Ancillary Service Market				Market issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	How does bidding of ancillary services between or among RTOs affect the scheduling and dispatch obligations within the RTOs? Can this kind of trade between RTOs be accommodated? Does trade of these services between RTOs have implications for either the "exporting" or "importing" RTO's ability to meet reliability criteria? (Issue I.b.15)
83 Products / Services	Market Design - Day Ahead. Ancillary Service Market				Fundamental approach -- scheduling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	When ancillary services are provided from within one RTO for another RTO, does the providing RTO recognize them as obligations within the seller's RTO? (Issue I.b.16)
84 Settlements	Market Design - Day Ahead. Ancillary Service Market				Other issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	How can AS bids be coordinated across three markets to avoid both double counting and inefficient limitations on bids? (Issue I.b.17)

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85 Uncategorized	Market Design - Day Ahead. Ancillary Service Market				Other issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Does the RTO of the A/S seller recognize the transmission capacity reservation required to enable the reserves to respond for outages in the RTO of the buyer? (Issue I.b.18)
86 Settlements	Market Design - Day Ahead. Ancillary Service Market				Other issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	All three propose auctions: Do the auctions have be identical? Is it possible to use price exchange (say as imputed bids) in connection with interactive calculation to minimize the spread between the A/S auctions? (Issue I.b.19)
87 Scheduling / Ramping	Market Design - Day Ahead. Acquisition Mechanism				Other issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Does unit commitment need to be standardized? Is this an area where each RTO can have its own method, which matches its resource mix and system responsiveness? (Rapid response of hydro gen. versus lead time requirements for thermal gen.) (Issue I.b.20)
88 Uncategorized	Market Design - Day Ahead. Centralized Unit Commitment.				Other issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Does a recallable physical right conflict with a redispatch set in a day-ahead clearing process? (Issue I.b.21)
89 General Data / Procedures	Market Design - Day Ahead. Release of Unused Transmission Capacity after Close of DA Markets				Fundamental approach -- scheduling issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	How are boundary prices to be synchronized between RTO's if only one RTO has a hour ahead process? Is it necessary to align hour ahead markets? (Issue I.c.1)
90 General Data / Procedures	Market Design - Hour Ahead. Timing				Market issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	How does hour-ahead market integrate with neighbors who do not have hour-ahead process? (Issue I.c.2)
91 General Data / Procedures	Market Design - Hour Ahead. Energy Market, Congestion Management Market, and Ancillary Services Market				Other issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Is it necessary to align real time markets? If so, can a method be developed to produce consistent real-time prices at the boundaries? (avoid an price discontinuity due to separate calculation of prices with different information.) (Issue I.d.1)
92 Uncategorized	Market Design - Real Time. Model objective function				Market issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	How much would a common dispatch interval mitigate against price discontinuities at boundaries? (Issue I.d.2)
93 Settlements	Market Design - Real Time. Dispatch interval				Market issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Can a method be developed to produce consistent real-time prices at the boundaries? (avoid an price discontinuity due to separate calculation of prices with different information.) If not, can discontinuities be tolerated or managed? [This may be more of a settlements issue than a consistency issue.] (Issue I.d.3)
94 Compliance	Market Design - Real Time. Imbalance Price				Market issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Do penalties need to be the same in each RTO? (Issue I.d.4)
95 Compliance	Market Design - Real Time. Penalties				Other issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Will inconsistent imbalance penalty practices hamper non-dispatchable resource sales across RTO boundaries? (Issue I.d.5)
96 Settlements	Market Design - Real Time. Penalties				Other issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Do settlement systems have to be common as long as price discontinuities at the boundaries are managed? (Issue I.e.1)
97 Settlements	Market Design - Post Real Time. Settlement stages				Other issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	How are inter-RTO settlements managed? (Includes the revenue adequacy issues related to achieving consistent prices.) (Issue I.e.2)
98 Products / Scheduling	Market Design - Post Real Time. Settlement stages				Market issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	How does bidding or demand-side response between or among RTO's affect the scheduling and dispatch of obligations within the RTO's? Can these kinds of trades between RTOs be accommodated? Does trade of these services between RTOs have implications for either the exporting or importing RTOs ability to meet reliability criteria? (Title to power needs to be established) (Issue II).
99 General Data / Procedures	Demand Response Participation.				Other issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	If there is an RTO capacity requirement for all RTOs, how will double-counting across RTOs be avoided? Note: RTO West and WestConnect are not currently proposing a resource adequacy requirement independent of the requirement for balanced schedules. (Issue X.1).
100 Capacity / Allocation	Resource Adequacy. Resource Adequacy Assessment.				Other issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	If there is an RTO capacity requirement for all RTOs, do different resource adequacy approaches result in different penalty structures and if so, does this create problems, e.g., opportunities for arbitrage? Note: RTO West and WestConnect are not currently proposing a resource adequacy requirement independent of the requirement for balanced schedules. (Issue X.2).
101 Scheduling	Resource Adequacy. Resource Adequacy Resolution.				Other issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	Many, but not all, of the general seams issues related to scheduling, redispatch, etc., are duplicated between RTO and adjacent non-participants to the extent the latter can and do operate unde existing WECC practices. (Issue XI.1).
102 Uncategorized	Seams Between RTO Participants and Non-Participants	RTO Market to Non-RTO Market	RTO	Non-RTO Market	Other issues.	SSG-WI, CMA Work Group	Syd Berwager - Bonneville PA	L	

Seams Issues Matrix

# Category	Description of Seam Issue	Seam Interface Type	Region 1	Region 2	Seam Impediment Type	Currently Being Addressed ?	Submitter	Reference Papers	Comments
103 Transmission	Transmission Service - Market participants require consistent treatment of transmission products across multiple control areas to reduce perceived market risk, scheduling confusion and uncertainty.	Market to Market	PJM	ISO NE, NY ISO	Market Rule / Business Practice	In Northeast Power Markets Seams Action Plan	Jeff Mueller - PSEG	H	
104 General Data / Procedures	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.	Market to Market	PJM	ISO NE, NY ISO	Market Rule / Business Practice	In Northeast Power Markets Seams Action Plan	Jeff Mueller - PSEG	H	
105 Settlements	Export Charges (Pancaking) - Control-area specific export charges remove incentives to transact business when transaction margins are of the same magnitude or less than the prevailing export charges. Such charges include transmission and ancillary service components.	Market to Market	PJM	ISO NE, NY ISO	Market Rule / Business Practice	In Northeast Power Markets Seams Action Plan	Jeff Mueller - PSEG	H	
106 Scheduling	Transaction Scheduling - Inconsistent information and market timing rules lead to uncertainty and risk that discourage the scheduling of some inter-regional transactions.	Market to Market	PJM	ISO NE, NY ISO	Market Rule / Business Practice	In Northeast Power Markets Seams Action Plan	Jeff Mueller - PSEG	H	
107 Planning	Transaction Curtailment - Transaction curtailments for security may extend beyond the reliability need due to differences in market timing. Extended curtailments are disruptive to both the marketplace and the reliable operation of the grid.	Market to Market	PJM	ISO NE, NY ISO	Market Rule / Business Practice	In Northeast Power Markets Seams Action Plan	Jeff Mueller - PSEG	H	
108 Scheduling / Ramping	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.	Market to Market	PJM	ISO NE, NY ISO	Market Rule / Business Practice	In Northeast Power Markets Seams Action Plan	Jeff Mueller - PSEG	H	
109 ATC	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.	Market to Market	PJM	ISO NE, NY ISO	Market Rule / Business Practice	In Northeast Power Markets Seams Action Plan	Jeff Mueller - PSEG	H	
110 ATC	ATC Manipulation - Market participants schedule transactions day-ahead and beyond with no intent to deliver energy. Cancellation in real-time by a market participant results in unused ATC, ramp capability that cannot be used by other market participants. Valuable capability is left unused.	Market to Market	PJM	ISO NE, NY ISO	Market Rule / Business Practice	In Northeast Power Markets Seams Action Plan	Jeff Mueller - PSEG	H	

Seams Issues Matrix

# Category	Description of Seam Issue	Seam Interface Type	Region 1	Region 2	Seam Impediment Type	Currently Being Addressed ?	Submitter	Reference Papers	Comments
111 Products	Capacity Market - Differences in ICAP definitions, requirements, deliverability, and recall procedures have hampered the ability of suppliers to sell ICAP between Northeast ISOs (include regional resource adequacy model, external 30-minute reserves participation, harmonize demand response programs)	Market to Market	PJM	ISO NE, NY ISO	Market Rule / Business Practice	In Northeast Power Markets Seams Action Plan	Jeff Mueller - PSEG	H	
Products / 112 Transmission	Long-term Transmission Service Availability to Support ICAP Transactions - Firm transmission reservation requirements to establish "Deliverability" as a requirement to buy external ICAP results in an economic advantage for internal suppliers and a barrier to market entry for external suppliers.	Market to Market	PJM	ISO NE, NY ISO	Market Rule / Business Practice	In Northeast Power Markets Seams Action Plan	Jeff Mueller - PSEG	H	
113 Products	Green power attributes trading	Market to Market	PJM	ISO NE, NY ISO	Market Rule / Business Practice	In Northeast Power Markets Seams Action Plan	Jeff Mueller - PSEG	No	
Transmission / 114 Generation	Coordination of interregional planning including transmission facilities and generator interconnection procedures	Market to Market	PJM	ISO NE, NY ISO	Market Rule / Business Practice	In Northeast Power Markets Seams Action Plan	Jeff Mueller - PSEG	H	
Congestion 115 Management	Congestion Management Procedures including reciprocal coordination agreement, exchange of data for real-time and projected operations, SCADA, EMS, Operations Planning and Planning information and models; better granularity, avoid double counting, use of state estimator and LMP to enable RTOs to accurately and consistently quantify flows/impacts outside of NERC IDC to enable RTO to RTO and market to market congestion management to achieve greater efficiencies without calling TLRs; MISO and PJM and expansions to use same methods	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	I	
116 ATC	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	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	No	
117 Uncategorized	Contract Tie Capacity - One Stop Shopping	All	PJM	MISO	Market Rule / Business Practice	No	Jeff Mueller - PSEG	No	
118 Uncategorized	Emergency and Restoration Plans - operating procedures for Voltage Collapse and Stability	All	PJM	MISO	Market Rule / Business Practice	Included in Attachement A of MISO and PJM Reliability Plans	Jeff Mueller - PSEG	I	

Seams Issues Matrix

# Category	Description of Seam Issue	Seam Interface Type	Region 1	Region 2	Seam Impediment Type	Currently Being Addressed ?	Submitter	Reference Papers	Comments
119 Uncategorized	NERC Regional Criteria and Reserve Sharing - define operating policy changes, waivers, or certifications that are needed to permit security-constrained dispatch over multiple existing control areas to allow flows not to be tagged; Joint Reliability Coordination - NERC Policies 5 and 9	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
120 Planning	Facilities in close electrical proximity under different RTOs - outage maintenance coordination, access and expansion planning	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
121 Flow Analysis	Market flow data - reflect ISN and SDX data	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
122 Uncategorized	Control area - control zone responsibilities vs. market operator	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
123 Uncategorized	GDLF calculation	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
124 Scheduling	Wide area dispatch and network resources to network loads - resource deliverability if not a firm network load	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
125 Uncategorized	Retention of former Cas in the model	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
126 Procedures	General Data / 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	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
127 Compliance	Industry oversight and reporting of PJM and MISO impact calculations - IDC cost, cost allocation to reimburse NERC	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
128 Planning	Congtingency plans; critical path analysis	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	

Seams Issues Matrix

# Category	Description of Seam Issue	Seam Interface Type	Region 1	Region 2	Seam Impediment Type	Currently Being Addressed ?	Submitter	Reference Papers	Comments
129 Flow Analysis	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	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
130 Settlements	What happens when MISO and PJM and outside PJM/MISO firm and CBM exceed TTC - day ahead mechanism to reduce oversubscribed conditions	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
131 Uncategorized	Express sunset provisions for implementation of Day 2 markets	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
132 Planning	Interaction with American Transmission Company; possible joint redispatch agreement among ATC-PJM-Generators on ATC's system	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	K	
133 Scheduling	Define "RTO areawide dispatch"	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
134 Settlements	Compensation for parallel flows	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
135 Flow Analysis	Historic NNL values should not be reflected indefinitely in the future, and an appropriate mechanism to rationalize the historic flows to recognize eventual market conditions should be developed	All	PJM	MISO	Market Rule / Business Practice	In PJM/MISO Congestion Management Proposal Whitepaper	Jeff Mueller - PSEG	J	
136 Products	Firm Transmission Service on IMO/MISO	RTO Market to RTO Market	NPCC	ECAR	Market Rule / Business Practice	No	Barry Green - Ontario Power Gen.	No	ATC postings between a physical reservation system and a financial reservation system
137 Uncategorized	Inconsistent Market Event Timelines	RTO Market to RTO Market	IMO	NYISO	Market Rule	No	Barry Green - Ontario Power Gen.	No	Timing issues between bid based markets (one example only - not knowing whether your bid has been accepted in "sink" market before having to commit in the "source" market).
138 Management	Congestion Coordination of congestion	All	All	All	Business Practice	Yes	Karl Tammer - ISO/RTO Council	No	Several regional efforts are underway. Coordinate practices and methods between areas with different market approaches.
139 Products	Standard defintion of energy products	All	All	All	Business Practice	Yes	Karl Tammer - ISO/RTO Council	No	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
140 Procedures	General Data / Standard messaging protocols for market notificaitons	All	All	All	Business Practice	No	Karl Tammer - ISO/RTO Council	No	Market participants will benefit from common messaging protocols.
141 Products	Replacement of contract path with flow-based transmission service	All	Eastern Inter-connection	Eastern Inter-connection	Business Practice	No	Ed Davis - Entergy	No	
142 Uncategorized	Pricing for native load loop flow impacts	All	Eastern Inter-connection	Eastern Inter-connection	Business Practice	No	Ed Davis - Entergy	No	

#	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	NERC ?? (Carl Monroe, Southwest Power Pool)
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	Report of the California ISO, the RTO West Filling Utilities, and the WestConnect Applicants Concerning Activities of the Seams Steering Group - Western Interconnection - Attachment D (Syd Berwager - Bonneville Power Authority).