

Infrastructure Issues in the Midwest: A “Seams” Analysis

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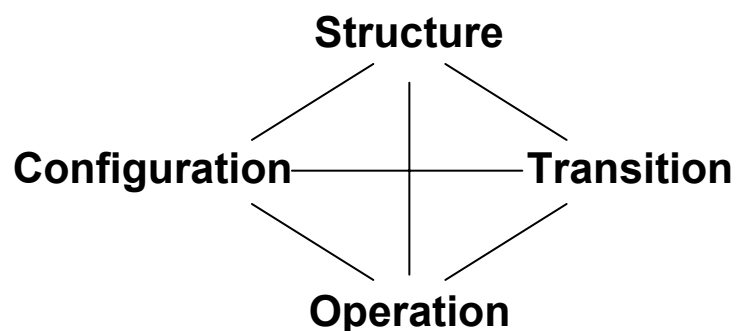
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Seams issues represent real threats to economic efficiency and power system reliability in electricity markets across North America.

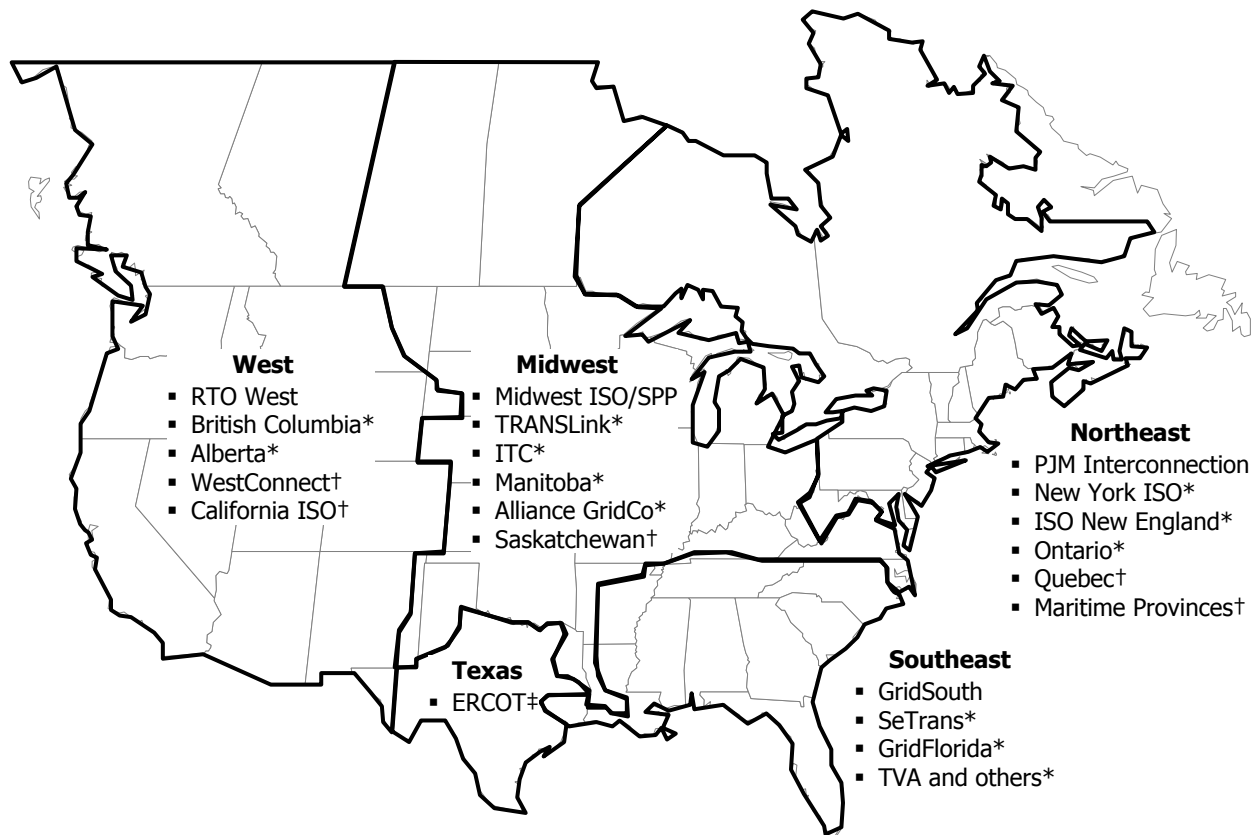
- ❑ **Trends** – widespread movement toward competitive wholesale electricity markets across North America, but with mixed results in achieving two primary objectives – economic efficiency and power system reliability
- ❑ **Challenge** – mitigation or elimination of policies, market rules, business practices, and information technology that hinder the ability of markets to deliver promised benefits
- ❑ **Definition** – “seams issues” can be defined as: *impediments to interregional trade in and delivery of electricity and related products and services which result in economic inefficiency and/or a threat to reliability*
- ❑ **References** – much of the analysis is based on FERC’s Order No. 2000 on Regional Transmission Organizations (RTOs), subsequent filings and orders, and policy related to the development of a standard market design (SMD) for electricity
- ❑ **Citations** – concepts originally appeared in research published by the International Association for Energy Economics for its *2001: An Energy Odyssey* conference (April 2001) and Elsevier Science in *The Electricity Journal* (July and December 2001)

To facilitate the analysis, we employ a framework that categorizes seams issues along two axes – configuration/transition and structure/operation.



- ❑ Issues along the *configuration/transition* axis are primarily related to the ongoing effort to establish regional competitive electricity markets
- ❑ Issues along the *structure/operation* axis are primarily related to the convergence of market design elements and related business practices
- ❑ The framework is designed to help provide structure to the ongoing analysis and policy debate focused on seams issues
- ❑ Note: seams issues are by their nature interrelated and may not fall wholly along a single axis or within a single category

In July 2001, FERC outlined its vision for regional markets and RTOs.



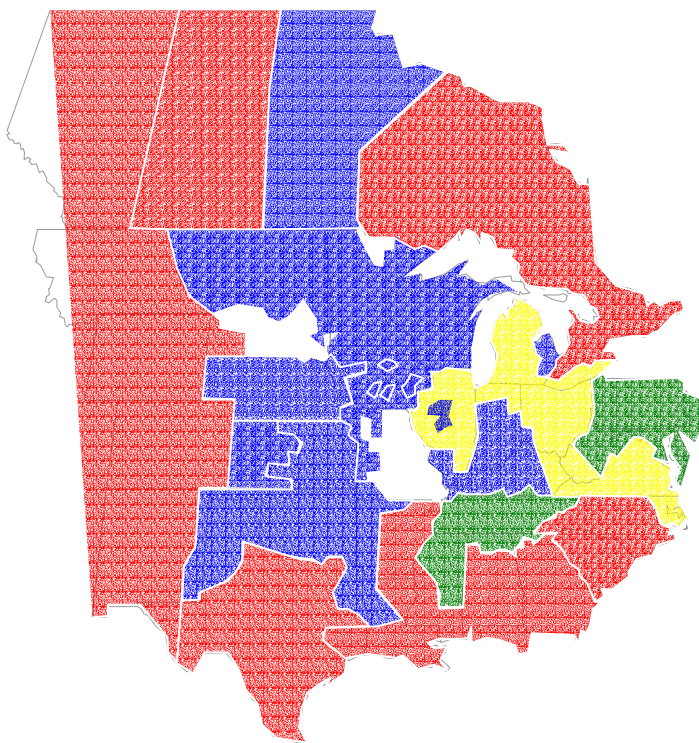
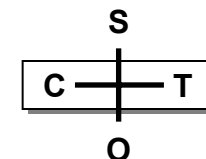
Source: Compiled from various sources, including RTO compliance filings, public Web sites, FERC orders, and market reports.

* Entities have expressed an interest in becoming a member, participated in RTO proceedings, and/or executed agreement(s).

† Entities may be eligible to become a participant based on RTO scope and regional configuration criteria.

‡ ERCOT does not fall under FERC jurisdiction but possesses many RTO characteristics and performs many RTO functions.

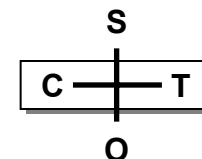
The Midwest region's scope and regional configuration has gone through several iterations – and continues to evolve...



- ❑ Current scope-enhancing entities:
 - /// Midwest ISO (via participant membership)
 - /// Southwest Power Pool (via merger)
 - /// TRANSLink (via “Appendix I”)
 - /// Manitoba Hydro (via coordination agreement)
 - /// PJM Interconnection (via convergence effort)
 - /// TVA (via seams agreement)

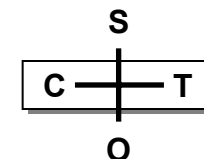
- ❑ Outstanding scope-related challenges:
 - /// Alliance GridCo (via “Appendix I”?)
 - /// SaskPower (via coordination agreement?)
 - /// ERCOT (via seams agreement?)
 - /// Ontario IMO (via seams agreement?)
 - /// SeTrans (via seams agreement?)
 - /// “West RTO” entities (via seams agreement?)
 - /// Others?

These issues have ranged from cross-border participation to consolidation of RTO candidates and Transcos.



- ❑ **Non-Jurisdictional Entities** – an issue of effective RTO participation:
 - /// Non-jurisdictional US entities (e.g., municipalities and cooperatives)
 - /// Canadian entities (e.g., Manitoba Hydro, SaskPower, Ontario IMO)
 - /// Several legal and regulatory issues remain unresolved
- ❑ **State Regulatory Agencies** – an issue of shared responsibilities and authority:
 - /// Primarily related to transmission planning and expansion
 - /// Also touches other functional areas (e.g., market monitoring)
 - /// Several cooperation and coordination issues remain unresolved
- ❑ **Corporate & Market Governance** – an issue of decision-making mechanisms:
 - /// Composition of independent RTO Board of Directors and executive team
 - /// Role and weight of various categories of market participants (e.g., Transcos)
 - /// Advisory role(s) for industry/market stakeholders

In many respects, the Midwest has taken a pioneering role in the treatment of super-regional and shared functions.



— Sharing of Functions Between RTO & Transcos —

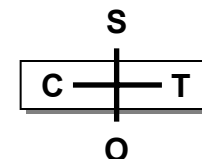
RTO

Transcos

	RTO	Transcos
1. Tariff Administration & Design	designs and administers tariff for region; multiple schedules allowed	may make sub-regional rate filings under separate tariff schedules
2. Congestion Management	operates single congestion management mechanism for region	has limited ability to redispatch for reliability during transition period
3. Parallel Path Flow	manages parallel path flow for region	assists, especially in emergencies
4. Ancillary Services	serves as POLR for most ancillary services, including imbalance energy	may provide select ancillary services, subject to “no harm” condition
5. Transmission Administration	operates OASIS node for region, calculates ATC, assures consistency	may have OASIS page, calculates TTC based on RTO formula
6. Market Monitoring	monitors markets for region	no specific duties
7. Planning & Expansion	serves as primary planning and expansion authority for region	may serve as authority for sub-region, subject to RTO authority
8. Interregional Coordination	coordinates with other regions	no specific duties

Source: Adapted from FERC’s Midwest Transco orders, issued in April 2002

RTO candidates and stakeholders in the Midwest region have indicated a preference for a phased transition program.



□ Baseline: Q4 2001 – Q1 2002

- /// FERC’s “go-live” deadline for RTOs, Midwest RTO orders and standard market design initiative
- /// Approved by FERC, Midwest ISO begins security coordination and transmission services roles
- /// Midwest ISO consolidates (e.g., SPP, MAPP, Manitoba Hydro and discussions with Alliance)

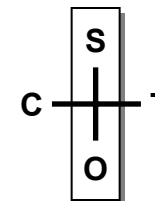
□ Incremental MISO-PJM-SPP Approach

- /// Increment #1 (Q1 2002-Q2 2003): Midwest ISO Operates Markets in Midwest ISO/SPP Area
- /// Increment #2 (Q2 2003-Q2 2004): Regional Market Standardization/Shared Data Services
- /// Increment #3 (Q2 2004-Q4 2005): Shared Market Services/Shared Data Services

□ Planning & Implementation Issues

- /// FERC’s standard market design NOPR (June 2002?) and final rule (December 2002?)
- /// Outstanding issues with Alliance GridCo and use of its systems
- /// PJM interconnection’s conflicting priorities between Northeast and Midwest

Some market convergence has occurred despite delays in RTO development and FERC's standard market design.



❑ Select Dimensions

- /// Participants: Genco, Trader/Marketer, RTO, Transco, Disco, Retailer, Consumer, Regulator
- /// Products/services: energy (RT & DA), regulation, reserves, capacity, transmission
- /// Mechanisms: auction, procurement, self-supply, locational pricing, hedging tools

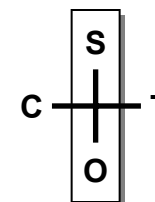
❑ Standardization

- /// FERC's standard market design (SMD) initiative will likely provide high-level policy guidance
- /// NAESB and NERC to work with industry stakeholders to define market and reliability standards
- /// Concerns: dependent on regulatory process; governance and decision-making challenges

❑ Convergence

- /// Open and consultative RTO-led efforts may ultimately produce the quickest results
- /// MISO-PJM-SPP joint and common wholesale energy market has made progress
- /// Concerns: may diverge from regulator's ideal; may not represent true industry perspective

Business practices currently being developed for use in the Midwest may eventually result in seams issues.



— Overview of Business Practices (by Category) —

Market Operations	Power System Operations	Market Facilitation
Transaction Management	Forecasting & Availability	Tariff Design & Administration
Market Clearing	Transmission Services	Market Monitoring
Congestion Management	Ancillary Services	Planning & Expansion
Financial Risk Management	Scheduling & Dispatching	Market Development
Settlement & Billing	Security & Reliability	Interregional Coordination
Market Information	Metering & Measurement	Dispute Resolution

RTO candidates, market participants and other stakeholders in the Midwest have made significant progress but much work remains...

- ❑ **Progress** – since FERC issued Order No. 2000, industry stakeholders in the Midwest have overcome challenges and made progress toward a wholesale electricity market and RTO with Midwest ISO as the first “unconditionally approved” RTO
- ❑ **Focus** – most of the activity to date has focused on seams issues along the *configuration/transition* axis (e.g., scope and regional configuration) rather than the *structure/operation* axis (e.g., market operations business practices)
- ❑ **Outlook** – based on past performance, current state, and anticipated future transition, the Midwest region is on its way to achieving a successful wholesale electricity market and RTO
- ❑ **Challenges** – consolidation (e.g., SPP and Transcos) and convergence (e.g., MISO-PJM-SPP initiative) will continue to present challenges in the transition toward a fully operational wholesale electricity market and RTO