Infrastructure Issues in the Midwest: A “Seams” Analysis

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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 —

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

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<tbody>
<tr>
<td>Transaction Management</td>
<td>Forecasting &amp; Availability</td>
<td>Tariff Design &amp; Administration</td>
</tr>
<tr>
<td>Market Clearing</td>
<td>Transmission Services</td>
<td>Market Monitoring</td>
</tr>
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<td>Congestion Management</td>
<td>Ancillary Services</td>
<td>Planning &amp; Expansion</td>
</tr>
<tr>
<td>Financial Risk Management</td>
<td>Scheduling &amp; Dispatching</td>
<td>Market Development</td>
</tr>
<tr>
<td>Settlement &amp; Billing</td>
<td>Security &amp; Reliability</td>
<td>Interregional Coordination</td>
</tr>
<tr>
<td>Market Information</td>
<td>Metering &amp; Measurement</td>
<td>Dispute Resolution</td>
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Conclusions

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.