Data Release & Accessibility Initiative

Wade McCartney
Sr. Market Design & Policy Specialist

Stakeholder Conference Call
November 12, 2009
Data Release & Accessibility Initiative
Phase 1: Transmission Constraints

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Introduction and Overview
November 12, 2009
ISO Stakeholder Process
Phase 1: Transmission Constraints

1. October 2nd FERC Order
2. Phase 1 Issue Paper on 11/5
3. Proposal Paper and Draft Tariff Language on 12/3

Proposal Paper and Draft Tariff Language on 12/3
FERC Filing Proposed Tariffs by 12/31
Implementation TBD

Opportunities for Stakeholder Input

We are here
Agenda for Conference Call

1. Data Release & Accessibility Initiative & Phase 1

2. Management of Transmission Constraints
   a. Transmission Constraint Enforcement Practices
   b. Transmission Limit Adjustment Practices
   c. Types of Information Regarding Transmission Constraints and Contingencies

3. Discussion of Specific Business Needs of Stakeholders
Overview: Data Release & Accessibility Initiative

Three phases, staggered start dates, some overlap.

- **Phase 1: Transmission Constraints**
  Issue Paper 11/5; 11/12 stakeholder conference call.

- **Phase 2: Convergence Bidding Information Release**
  Issue paper expected before Thanksgiving.
  Brief discussion of Phase 2 issues at the end of the 12/10 onsite stakeholder meeting.

- **Phase 3**: Other types of market data to support well-functioning, competitive ISO spot markets, including price discovery and outage information.
  Issue paper expected before year-end 2009.
Phase 1: Transmission Constraints
Overview & Objectives

- The goal of Phase 1 is to discuss and resolve the following three items:
  - **Constraint Enforcement Practices:** Determine what additional information and visibility can be provided with respect to the ISO’s transmission constraint enforcement and practices to account for system conditions in managing the limits of the transmission system.
  - **Constraint & Contingency Lists:** Determine how the ISO can provide (1) the list of enforced and unenforced constraints and (2) the list of active contingencies.
  - **Tariff Guidelines on Constraint Management:** Develop high-level guidelines that describe the ISO’s constraint management processes and include the appropriate level of detail in a tariff filing on or before 12/31/2009.
Data Release & Accessibility Initiative
Phase 1: Transmission Constraints

Mark Rothleder
Principal Market Developer

Management of Transmission Constraints
November 12, 2009
Constraint Enforcement Practices

- **Constraint Enforcement Practices**: Determine what additional information and visibility can be provided with respect to the ISO’s transmission constraint enforcement and practices to account for system conditions in managing the limits of the transmission system.

- **Management of Transmission Constraints**: The diagram on the following slide provides a broad overview of ISO practices in this area.
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Phase 1: Transmission Constraints

Nan Liu
Lead Operations Engineer

Transmission Constraint Enforcement Practices
November 12, 2009
Constraints/Contingencies Modeled

- Flowgates – Lines and Transformers
  - Normal and Emergency Ratings
- Operating Limits
  - Nomograms
  - Branch Groups
- Intertie Scheduling Limits: MSL & ITCs
- M-405: Base Line Constraints and Contingencies
- Additional Constraints are defined and modeled as needed for planned and forced outages
Constraints/Contingencies Enforcement Practices

- **Flowgates**
  - Normal Ratings enforced in market runs
  - Emergency ratings enforced by running select contingencies in the market

- **Internal Paths/Branch Groups enforced**

- **Nomograms enforced**

- **Intertie:**
  - All Intertie Constraint (ITC) enforced
  - All Intertie MSLs with no companion ITC enforced

- **There are Exceptions**
Exceptions/Un-enforcement

- Not under ISO direct control
- Outside ISO balancing authority area, not part of ISO Controlled Grid
- Where flow mismatches across/near boundary
- Lower voltage systems
- Conforming Conflict: Normal vs. emergency ratings (for Contingency consideration only)
- Equipment ratings ambient temperature dependent
- Use Limited Resources in Day-Ahead Market
Exceptions (Cont.)

- Operated under contracts/agreements that require local operating procedures

- Congestion can be mitigated by non-market/generation measures such as transmission switching

- Consideration for using adjustment instead of not enforcing a limit completely
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Phase 1: Transmission Constraints

Brian Jacobsen
Manager, Market Operations

Transmission Limit Adjustment Practices
November 12, 2009
Adjustment of Transmission Limits

- Not a new feature of ISO nodal market (MRTU)
- Applied to flow-based transmission limits
- Processes applied to day-ahead and real-time markets; similar but different
- Two drivers for adjusting limits:
  - Conforming limits to close gap between market modeling and operational observations and/or expectations
  - Create operating margin for reliability
Conforming Limits: Real-Time Markets

- To account for (one or more of the following):
  - Differences between market model flows and either (a) measured flows telemetered or (b) anticipated actual flows
  - Inherent differences in RTED (5-min), RTUC (15-min), and Day-Ahead (hourly) market design and modeling
  - Where flow visibility (telemetry) is unavailable or unreliable
- Procedure and tools developed to ensure consistent application of these principles
- Significant adjustments are “feathered in” to avoid abrupt market impacts (price spikes)
Conforming Limits: Day-Ahead Market

- To account for (one or more of the following):
  - Persistent need to conform limits in Real-Time Market
  - Historical difference between Day-Ahead Market flows and actual flows for the same operational day
- Market flows compared against anticipated real flows: engineering and operational experience driven
- Slightly more conservative compared to Real-Time Market conforming limits practice
Adjusting Limits for Reliability Margin

- To account for (one or more of the following):
  - Deliverability of Contingency Only operating reserves
  - Account for Regulation movement (for resources on AGC) in opposite direction of congestion management
  - Uncertainty of intermittent resources (wind): Day-Ahead
  - Adverse operating conditions

- Same margins in Day-Ahead and Real-Time
Mark Rothleder
Principal Market Developer

Types of Information Regarding Transmission Constraints and Contingencies
November 12, 2009
# Types of Information Regarding Transmission Constraints and Contingencies

<table>
<thead>
<tr>
<th>CRR Data Package</th>
<th>File</th>
<th>Re-fresh Under Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Full Network Model (FNM) base case</td>
<td>Raw</td>
<td>Upon new DB Model (6-8 weeks)</td>
</tr>
<tr>
<td>CRR Thermal branch limits (normal and emergency) for enforced elements</td>
<td>MonFac</td>
<td>Limits Upon new DB Model (6-8 wks) Enforce/Un-enforce Status – Daily</td>
</tr>
<tr>
<td>Branch group and Nomogram Constraint Definitions</td>
<td>Definitions</td>
<td>Definition upon new DB Model- (6-8 wks) enforced/Un-enforce – Daily</td>
</tr>
<tr>
<td>Branch Group and Nomogram Constraint Limits</td>
<td>Limits</td>
<td>OASIS already provides ties/WECC paths Enforce / Un-enforce Status – Daily</td>
</tr>
<tr>
<td>TOR / ETC / CVR Nominations</td>
<td>TOR, ETC, CVR, AN</td>
<td>Aggregate Unscheduled TR already available on OASIS</td>
</tr>
<tr>
<td>Contingency information</td>
<td>Definitions, Enforced</td>
<td>Definition upon new DB Model- (6-8 wks) - enforced/Un-enforce – Daily</td>
</tr>
</tbody>
</table>
### Types of Information Regarding Transmission Constraints and Contingencies

<table>
<thead>
<tr>
<th>Information</th>
<th>Current ISO Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Distribution Factor:</td>
<td>CRR provides LDF used for CRR and OAISIS provides typical seasonal</td>
</tr>
<tr>
<td>Power Transfer Distribution Factor:</td>
<td>A typical set can be derived from available CRR model</td>
</tr>
<tr>
<td>Adjustment to Limits:</td>
<td>Information not reported</td>
</tr>
<tr>
<td>Unplanned Transmission Outages:</td>
<td>Only planned outages</td>
</tr>
</tbody>
</table>
Approach to Provide a List of Constraints/Contingencies

- **Creation of a Daily All Constraints and Contingencies List**
  - Full daily list of Constraints Enforced and Not Enforced in the Day-Ahead Market
  - Full daily list of Contingencies model in the Day-Ahead Market
  - Provided after a Day Ahead Market list is implemented
  - Real-Time Market - Benefit/Cost Considerations with creating more frequent RTM lists

- **Alternative**
  - provide list of constraint changes from CRR model
  - administratively cumbersome/redundant
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Phase 1: Transmission Constraints

Stakeholders
Open Forum

Stakeholder Business Needs
November 12, 2009
Stakeholder Business Needs

- Stakeholder input on their transmission constraint management information business needs
- Follow-up questions from ISO staff
- Areas of agreement
- Outstanding issues
Next Steps

- Stakeholder comments due by close of business Monday, November 23rd to phase1tc@caiso.com
- On or before Thursday, December 3rd: Publish data release proposal and draft high-level guidelines for constraint management tariff language.
- December 10th (Thursday): On-Site Stakeholder Meeting
- December 16th (Wednesday): Stakeholder comments on data release proposal and draft tariff language.
- December 31st (Thursday): FERC Compliance Filing in ER09-1542-000
- Post-December 31st: Provision of information proposal and implementation details finalized