RTO West

Congestion Management Work Group
Report to the RRG

Recommendations and Open issues

August 10, 2000

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Outline of Presentation

- **Principles and Objectives of Congestion Management WG**
- **FERC Order 2000 says much about Congestion (some excerpts)**
- **Issues Assigned to CM WG by the RRG**
- **WG Recommendations / Open Issues**
- **Summary Recommendations / Direction to WG from RRG**

Principles and Objectives of Congestion Management WG:

- **Provide for consistent and unbiased access to all transmission grid facilities by all eligible parties.**
- **Efficient use of constrained transmission paths through pricing of Firm Transmission Rights (FTRs) on facilities that has commercially-significant amounts of congestion**
- **Translation (equal value) of existing contracts rights and honoring of non-converted contract rights**
- **Identify constraints on the system and be able to take operational actions to relieve those constraints within the trading rules.**
- **Provide price signal on the cost of congestion to support market based planning to relieve congestion.**

FERC Order 2000 says much about Congestion (some excerpts):

• "In the NOPR, we proposed seven minimum functions that an RTO must perform. In general, we proposed that an RTO must:

(2) create market mechanisms to manage transmission congestion;"

• "[W]e conclude that the RTO or an independent entity must assume an active role in developing and implementing any congestion market mechanisms, because the use of such mechanisms must necessarily be closely coordinated with the operational activities that the RTO performs on a day-to-day and, in many cases, moment-to-moment basis." (p. 380)

• "[W]e…proposed that the market mechanisms must accommodate broad participation by all market participants, and must provide all transmission customers with efficient price signals regarding the consequences of their transmission usage decisions." (p. 332)

FERC Order 2000 says much about Congestion (some excerpts – continued):

• "[W]e will require the RTO to implement a market mechanism that provides all transmission customers with efficient price signals regarding the consequences of their transmission use decisions. We are convinced that efficient congestion management requires that transmission customers be made aware of the cost consequences of their actions in an accurate and timely manner, and we believe that this is best accomplished through such a market mechanism." (p. 382)

• "[T]raditional approaches to congestion management such as those that rely exclusively on the use of administrative curtailment procedures may no longer be acceptable in a competitive, vertically de-integrated industry. We thus concluded that efficient congestion management requires a greater reliance on market mechanisms…" (p. 333)

• "[E]very RTO must establish a system of congestion management that establishes clear rights to transmission facilities and provides market participants with price signals that reflect congestion and expansion costs." (p. 489)

Issues Assigned to CM WG

Issues Assigned to CM WG:

- **Congestion Pricing**
  - **Recommendations with open issues**
- **Firm Transmission Rights (FTRs)**
  - **Recommendations with open issues**
- **Pre-existing Contracts and Obligations (PCOs)**
  - **Process under development**
- **Control area functions to be performed by the RTO – Joint team with Ancillary Services**
  - **Joint work group addressed Scheduling Coordinator and Control Area Consolidation**

Issues Assigned to CM WG (continued):

- **Transmission Planning – Pricing Mechanism**
  - **Joint work group with Planning and Transmission Pricing WG addressing this issue.**
- **Transmission Losses**
  - **Joint work team to address**
- **Price Reciprocity and Other Seams Issues**
  - **Assist Seams and Transmission Pricing WGs as needed**
- **Operations**
  - **Define the scheduling process, since intimately related to Congestion Management**
  - **Receive assistance for Implementation WG as needed**

WG Recommendations / Open Issues

Physical Rights Model - Objectives

- Provide non-discriminatory open access using efficient market-based mechanisms.
- Use pricing to manage congested paths and to signal the the market to relieve congestion.
- Provide equivalent value to preexisting rights holders.
- Provide for a secure and reliable grid.
- Maximize opportunities for efficient decentralized decision making, both access and pricing, by market participants.
- Minimize the RTO's role in forward energy, transmission and ancillary services markets.

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Physical Rights Model - Essential Conditions

- Unbundling of energy, transmission and ancillary services.
- Transparency of RTO process (models, pricing and operations).
- For RTO requirements (e.g. ancillary services, Firm Transmission Rights, etc.)
  - Terms and conditions are conveyed ahead of time.
  - Requirements can be traded bilaterally and through external exchanges.
  - Wherever possible, requirements such as ancillary services can be self-provided.

Physical Rights Model - Prerequisites

- Firm Transmission Rights (FTRs) clearly defined and released to the marketplace
- RTO model must adopt reasonable commercial simplification of grid operation (there must be procedures to manage differences between the commercial model and the operational model “real world”).
- RTO scheduling protocols to accommodate continuous secondary markets operating as close to real time as possible.
- Efficient markets external to the RTO will exist
  - Transmission exchanges
  - Power exchanges
  - Ancillary Service exchanges

RTO West Physical Rights Model - Characteristics

- Based on how power actually flows, as contrasted with a contract path model.
- Commercially significant congestion is managed by attributing costs to transmission users of the congested path(s).
- Transmission grid users acquire Transmission Rights to schedule on the commercially significant paths (flowpaths). If no congestion there is no cost to schedule.
- All other congestion (small, unpredictable, system not in a normal state, etc.) is managed by the RTO and allocated to users through an uplift charge. The RTO manages residual congestion through a combination of inc and dec bids and rights buyback.

Physical Rights Model - Flowpaths

- **Flowpaths** (also called flowgates or cutplanes) are transmission facilities that experience commercially significant amounts of congestion.
- **Congestion Zones** are regions where incremental injections (or withdrawals) have substantially similar impacts on power flows across the flowpaths.
- Commercially significant amounts of congestion was defined by CAISO as congestion for which the cost of relief over some period (12 months), is greater than some threshold (5%) of the average access charge on a per MW basis.
- Many key paths and their ratings have been established through the WSCC process.

RTO West Physical Rights Model – Flowpaths (cont'd)

- Western Interconnection Biennial Plan (6/00) lists paths with operational procedures or system redispatch.
- Identified a candidate set of 14 - 40 flowpaths. Still addressing the exact number.
- Objective is to strike a reasonable balance between:
  - Trading model simplicity to enhance trading and liquidity.
  - Reasonably small amounts of congestion costs treated as uplift.
  - Consistency of the commercial and operations models.
- Since congestion data is not readily available, judgement will be required to establish the initial set of flowpaths.
- A process will be developed to add or remove flowpaths in the future. This should involve specific triggers and adequate opportunity for stakeholders to participate in the decision.

Flowpath Candidate Map

Insert PAC Map Here

Physical Rights Model - Flow Distribution Factors

- **Flow Distribution Factors** (also called Path Utilization Factors) show how power injected at a source and removed at a sink will distribute across the defined flowpaths.
- A table of FDFs can be developed from a power flow study.
  - As a approximation, FDFs *do not* change by season, dispatch or load level.
  - FDFs *do* change if grid facilities are added, removed or changed.
  - Where phase shifters are used to manage flows, they should be modeled when determining the FDFs.

Physical Rights Model - Flow Distribution Factors **(cont'd)**

- As part of the balance between simplicity of the model and the amount of congestion costs treated as uplift, a *minimum* threshold will be established below which it will not be necessary to hold FTRs in order to schedule.
- There is a tradeoff between reserving a portion of Transmission Reliability Margin (TRM) for managing residual impacts and releasing the maximum amount of FTRs into the marketplace.

Physical Rights Model - Flow Distribution Factors **(cont'd)**

- FDFs will change over time either due to temporary or permanent changes to the grid (e.g. outages or new lines).
- FDF changes can impact the flowpath rights needed for scheduling a particular transaction.
- To the extent that facilities are upgraded or added, ratings will be revised or developed through the WSCC or successor process and the FDFs will be updated.

Preexisting Contracts and Obligations (PCOs) - Principles

- Rights to use RTO West transmission facilities are associated with Preexisting Contracts (PECs) and Load Service Obligations (LSOs) with service commencement *(prior to the RTO Grandfathering Date).*
- Rights will be honored for the duration of the contract or obligation.
- A transmission customer's transmission rights may be associated with PECs, LSOs or some combination thereof.

PCO Translation Process

- Process under development to determine PCO transmission rights on a flowpath basis.
- PCO existing rights/obligations translated to flowpath specific allocation of rights (FTRs).
- Flow distribution factors would be used in translation process.
- Details to be worked out.

PCOs - Entitlement to FTRs
3 Alternatives Under Review

- At the election of the party holding FTRs associated with a PEC or LSO, their FTRs may either be withheld from or included in the annual auction.
- FTRs are monetized and the party is entitled to the revenue from the auction of the rights.
- If quantity of rights on a flowpath is:
  - Less than or equal to x% - At your option to place or withhold from the auction
  - Greater that x% - Must be placed in the auction and a reserve price (of any amount) can be submitted.

Types of Transmission Rights:

- **Firm Transmission Rights (FTRs)**
  - **Firm Right to schedule on Congested Flowpath**
- **Recallable Transmission Rights (RTRs)**
  - **Firm Right not scheduled in Day Ahead Market by Rights holder is sold as recallable with provision to recall if needed for scheduling.**
- **Non Firm Transmission Rights (NCRs)**
  - **Release of capacity reserved for NCRs, recalled anytime up to near real-time.**

Firm Transmission Rights:

- **Defined and sold in annual auctions.**
- **Additional releases and auction of rights will occur on a monthly, weekly and daily basis.**
- **The rights can be defined as a flexibly within duration specified by auction.**
- **The rights will be further defined on a Term Sheet that specifies:**
  - The planned maintenance schedule (for large construction and rebuild projects);
  - The frequency and duration of other de-rates of a customer's rights;
  - Historical levels of unplanned outages on the flowpath
- **Held or sold in secondary market**

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- Who is responsible for the cost of managing residual congestion?
- Residual congestion is congestion resulting from the difference between the commercial and operational models. The RTO will resolve this congestion through use of inc/dec bids and rights buyback
- Options
  - Buyer Beware, all costs borne by FTR holder
  - Socialized, recovered from all users(on Company, zone or RTO basis)
  - Hybrid, cost below threshold or those associated with non path facilities socialized with remain borne by path users

Scheduling and Managing Congestion

(Detail Process under Development)

- Pre-RTO formation and as required
  - Market participants' pre-existing rights are translated to path specific RTO Transmission service.
- Mid-term (year ahead to day ahead)
  - Market participants acquire FTRs in RTO's primary release process and buy/sell FTRs in secondary markets, or choose to rely on RTRs/NTRs near real time
- Day ahead scheduling process
    - Scheduling Coordinators balance resource portfolios and acquire RTRs and NTRs if needed.
    - Scheduling Coordinators submit balanced schedules to the RTO
    - RTO manages any residual congestion.

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Scheduling and Managing Congestion (cont'd)

- Schedule Adjustment Process (Post-day ahead, but pre-real-time)
  - Scheduling Coordinators may submit additional balanced schedules to the RTO, provided that they do not create additional congestion
- Real time
  - RTO resolves real time congestion using A/S resources
  - Scheduling coordinators may change resource schedules subject to RTO approval
- Settlements (post real time)
  - Scheduling Coordinators provide validated meter data to the RTO
  - RTO sends preliminary balancing energy charges and Ancillary Services charges to SCs
  - Scheduling Coordinators may trade energy imbalances with one another and settle with RTO for the net.

Recommendations:

- **Next Step for WG**
  - **Keep Addressing Open Issue related to CM**
  - **Form dedicated group to develop PCO rights translation approach**
    - Complete by Sept 1
- **Provide Additional Consensus Next Week and Position Statements on Non-Consensus Issues**
- **Provide direction as Policy Statement on Open Issues**
- **Accept the Consensus provided in this Report**

Questions/Comments

Congestion Management WG

Calendar:

May 24, 2000	**Kick Off Meeting - Complete**	**RTO West Facility**
June 6-7, 2000	**CM Workshop - Complete**	**RTO West Facility**
June 12	**CM WG Meeting #2 - Complete**	**RTO West Facility**
June 19	**CM WG Meeting #3 - Complete**	**RTO West Facility**
June 26-27	**CM WG Meeting #4 - Complete**	**RTO West Facility**
July 10-11	**CM WG Meeting #5 - Complete**	**RTO West Facility**
July 18	**CM WG Meeting #6 - Complete**	**RTO West Facility**
July 24-25	**CM WG Meeting #7 - Complete**	**RTO West Facility**
July 31-August 1	**CM WG Meeting #8 - Complete**	**RTO West Facility**
August 7-8	**CM WG Meeting #9 – Complete**	**RTO West Facility**
August 15	**CM WG Meeting #10**	**RTO West Facility**
As necessary		

More Face to Face Meetings