Principles: Real Time Scarcity Pricing

SPWG

August 11, 2009

Howard J. Haas

Monitoring Analytics

Proposed Scarcity Pricing Approach: Overview

- **Concept: Add reserve requirements as constraints to the optimization model**
  - **No separate offers for reserves products (other than existing reserve product offers)**
  - **Shortages defined relative to primary reserve requirements**
    - **Need meaningful defined targets**
    - **Correct measurement is required**
  - **Reserve regions must be of sufficient size and resource owner diversity to mitigate gaming opportunities (two or more transmission zones)**
  - **Full scarcity revenue offset in RPM**

Proposed Scarcity Pricing Approach: Consistent with Dispatch

- **Scarcity signals should be implemented via reserve requirements modeled as constraints for predefined reserve regions in the security constrained dispatch**
  - **Reserve Constraint Penalty Factor Curve (RCPFC)**
    - Defined by reserve constraint penalty factors
    - Defined for primary reserve requirements
  - **The level of the penalty factor would be determined by the severity level of the primary reserve shortage event.**
  - **Would provide a means to signal scarcity that is consistent with economic dispatch, consistent with locational pricing, consistent with market power mitigation and consistent with competitive market outcomes.**

Proposed Scarcity Pricing Approach: Stages of Scarcity

- **Scarcity pricing should include stages, based on system conditions, with progressive impacts on prices.**

- **Each emergency measure taken in a given scarcity pricing region:**
  - Would tighten the reserve requirement constraint for that region
  - Could increase the penalty factor associated with the reserve requirement constraint

Proposed Scarcity Pricing Approach: Maintain Market Power Mitigation

- **Properly set, the penalty factors would increase prices on the system to provide a rational locational pricing signal properly reflecting the severity of the shortage of reserves in the reserve region.**
- **Should maintain offer capping rules during scarcity**
  - **Eliminates the "need" and incentive for participants to make non-competitive energy offers in anticipation of scarcity events.**
  - **Operationally cleaner solution**

Proposed Scarcity Pricing Approach: Overview

- **Results in optimized allocation of resources between energy and reserves**
  - **LMP is the incremental cost to serve incremental load at a location while controlling for *all* related constraints**
  - **LMP = Energy + Marginal Losses + Congestion + Reserve Penalty Factors**
- **RPM and Scarcity Revenue Offset**
  - **Capacity Resources should not collect the Reserve Penalty Factor component of LMP**