

Phase 1

Projected Timeline - complete stakeholder process Q4-2011 and implement in Q1-2012

- 1) Performance factors
 - a. Calculated hourly for each interval a resource regulates
 - b. Feedback to the resource owners via GPM or eMKT
 - c. Alerts to resources below minimum threshold in near real time
- 2) Below minimum threshold
 - a. Resources made ineligible for compensation in a regulating hour when regulation performance score is below 25% for that hour
 - b. Disqualification from the regulation market if a resource's rolling average score of last 100 hours falls below 40%
 - c. When disqualified, a resource must re-test and re-qualify
 - d. Once a unit re-qualifies the rolling 100 hour average resets
- 3) Reduce Energy Ramp Rate used by SPREGO and SCED to minimize the conflict when a resource is ramping for energy or regulation
 - a. While regulating, the segment specific ramp rate should be:

$$\text{Bid-in Energy Ramp Rate} - \frac{\text{Cleared Regulation Capacity}}{5}$$
 - b. Minimum MW/min ramp rate constraint applied
 - c. This change incorporates the Product Substitution Cost in the RMCP
 - d. Increased RMCP and PSC may be offset by lower after-the-fact make-whole payments and a lower regulation requirement.

Phase 2

Projected Timeline - Implement by Q4-2012 pending FERC approval

1. Performance factors
 - a. Adjust the merit order stack for both capacity and mileage
 - b. For initial or increased regulation capability use the performance factor scoring technique of a unit's ability to follow the actual regulation signal using the current three test benchmark
2. Two part payment
 - a. Based on Regulation Capability and Mileage
 - b. Hourly clearing based on lowest total expected production cost
3. Mileage
 - a. Payment determined by:
 (Mileage Clearing Price * Normalized Miles of the Regulation Control Signal * Performance Factor * Regulation Capability)
 - b. Units with the ability to provide fast regulation will receive about 3-4 times more mileage \$ based on current signals
4. Reduction in Regulation Capability Procured
 - a. Improved performance of regulating resources due to performance scoring should reduce procurement
 - b. Track actual changes in regulation capability procured with CPS1 and BAAL needs driven by delta load or other estimation

Current State

Change and Phase indicated by color

1. Regulation Resource Eligibility Testing
 - a. 0.5 MW minimum of regulation capability for all resource types (in process of changing to 0.1 MW)
 - b. Resources follow square wave control signals for 10 minutes. **Replaced by actual control signals – Phase 2.**
 - c. 75% passing composite score of 3 consecutive tests for initial qualification, then best 3 out of 4, 3 out of 5, 4 out of 6, or 5 out of the last 7 tests for on-going qualification. **Replaced by Performance Factor based qualification and disqualification – Phase 1 & 2.**
2. Data Transfer and Control Signals
 - a. Differentiated by speed
 - i. Slow or traditional signal
 - ii. Fast or dynamic signal
 - b. AREG – unit level hourly assignment, created by SPREGO used by SCED, sent by PJM
 - c. REGA – fleet level regulation signal sent by PJM
 - d. TREG – total fleet capability sent to PJM
 - e. CREG – total fleet response sent to PJM
3. Market Clearing
 - a. Total Regulation Market Size – 1% of forecasted load in on/off peak periods. **Adjusted based on increased performance and alignment with reliability needs – Phase 2.**
 - b. Merit Order Stack – Resource owners submit specific offers to provide Regulation. SPREGO then optimizes the RTO dispatch profile and forecasts LMPs to calculate an hourly Regulation Market Clearing Price (RMCP). **Replaced by two part clearing price – Phase 2.**
 - c. Regulation LOC – takes into account shoulder hour in a make whole payment. **Energy Limited Ramp Rate will alter LOC potentially lowering it – Phase 1&2.**
 - d. Regulation TPS – tests for market power of a supplier. When test is failed resource receives regulation cost based offer.
4. Verification – After the fact manual process that compares goodness of fit from TReg to resource response. **Replaced with automated Performance Factor based scores and thresholds – Phase 1&2.**
5. Regulation Settlement
 - a. $MW * RCMP + LOC$. **Replaced by two-part clearing – Phase 2.**
 - b. Settlement is a line item
 - c. Regulation Credit Report delivers more detail.