Operating Reserves Rules Update

RMWG

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Market Monitoring Unit

Market Power Issues: Operating Reserves Goals

- Goal is competitive outcome
- Ensure that units cannot use operating parameters to exercise market power
  - Require flexible operating parameters
  - Require operating parameters consistent with unit capabilities

- When the relevant market is not structurally competitive, market power may be exercised via submission of inflexible operating parameters compared to unit capabilities
  - Long minimum run times
  - Small number of starts per day/week
  - Long minimum down times
  - Set economic minimum equal to or close to economic maximum

Market Power Issues: Proposed Changes

- Operating parameters proposal:
  - Define relevant market
  - Define non-competitive market structure using three pivotal supplier test for relevant market
  - When market structure is non-competitive, use competitive parameter schedule

- Operating parameters proposal:
  - Limit competitive operating reserve parameters to be consistent with operating parameters based on the market data for actual PJM market offers by unit class, where relevant.
  - Limit competitive operating reserve parameters consistent with economic minimum and economic maximum points set consistent with unit capabilities based on PJM market data
  - Limit payment of operating reserves credits to units that may provide operating reserves – exclude nuclear units from operating reserves credits eligibility except in cases where nuclear units requested to back down by PJM
  - Exception process - limit operating reserve parameters to be consistent with operating parameters based on physical, operational issues at specific units, where relevant.

Definitions of Relevant Operating Parameters

•**Minimum Down Time** — The minimum number of hours between starts, calculated as the difference between when the unit shuts-down and the next time the unit is put online, as measured by telemetry available to PJM.

•**Minimum Run Time** — The minimum number of hours a unit must run, from the time the unit is put online to the time the unit is shut down (as measured by PJM's state estimator).

•**Maximum Daily Starts** — The maximum number of times that a unit can be started in a day under normal operating conditions.

•**Maximum Weekly Starts** — The maximum number of times that a unit can be started in a week under normal operating conditions.

Definitions of Relevant Operating Parameters

•Turn Down Ratio – The ratio of economic maximum MW to economic minimum MW.

•Cold Start Lead Time — The time interval, measured in hours, from the time of PJM notification to the actual unit start sequence to the unit breaker closing for a generating unit in its cold temperature state.

•Hot Start Lead Time — The time interval, measured in hours, from the time of PJM notification to the actual unit start sequence to the unit breaker closing for a generating unit in its hot temperature state.

•Warm Start Lead Time — The time interval, measured in hours, from the time of PJM notification to the actual unit start sequence to the unit breaker closing for a generating unit in its warm temperature state.

eMKT User Guide - http://www.pjm.com/etools/downloads/emkt/ts-userguide.pdf

Parameter Discussion – Additional Points

- Diesel unit parameters are the same as Small Frame CT and Aero Units.
- Modified Medium Frame CT parameters
  - Max daily starts
  - Max weekly starts
- Modified Large Frame CT parameters
  - Max daily starts
  - Max weekly starts
- Petroleum and Natural Gas Fired steam units: Pre 1985
  - Traditional utility steam generators
- Petroleum and Natural Gas Fired steam units: Post 1985
  - QF applications - dedicated steam host

PJM Unit Parameter Matrix Summary

Turn Down Ratio = Economic Maximum MW / Economic Minimum MW

Parameter	Minimum Down Time (Hrs)	Minimum Run Time (Hrs)	Maximum Daily Starts	Maximum Weekly Starts	Turn Down Ratio
Small Frame CT and Aero CT Units - Up to 29 MW ICAP	2.0 or Less	2.0 or Less	2 or More	14 or More	1.0 or More
Medium Frame CT and Aero CT Units - 30 MW to 65 MW ICAP	2.0 or Less	3.0 or Less	2 or More	14 or More	1.0 or More
Medium-Large Frame CT Units - 65 MW to 125 MW ICAP	3.0 or Less	5.0 or Less	2 or More	14 or More	1.0 or More
Large Frame CT Units - 135 MW to 180 MW ICAP	4.0 or Less	5.0 or Less	2 or More	14 or More	1.0 or More
Combined Cycle Units	4.0 or Less	6.0 or Less	2 or More	11 or More	2.0 or More
Petroleum and Natural Gas Steam Units - Pre-1985	7.0 or Less	8.0 or Less	1 or More	7 or More	3.0 or More
Petroleum and Natural Gas Steam Units - Post-1985	3.5 or Less	5.5 or Less	2 or More	11 or More	2.0 or More
Sub-Critical Coal Units	9.0 or Less	15.0 or Less	1 or More	5 or More	2.0 or More
Super-Critical Coal Units	84.0	24.0 or Less	1 or More	2 or More	1.5 or More