

Manual 11 Updates: Regulation and Reserves

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August 22, 2019

Action Required	Deadline	Who May Be Affected
Communicate to Staff about updates to Manual 11	9/26/2019	Market Buyers, Market Sellers



- Manual updates
 - Document procedure for addressing missing historical performance scores in the regulation market
 - clarify that the reserve requirements used in the market clearing process are based on the potential largest single contingencies which are communicated by PJM Operations and modeled in the markets clearing software.

- The historic performance score is used to adjust Regulation Resource Offer Price, Offer MW and Opportunity Cost
 - Calculated for each regulation resource by signal type
 - Calculated as a rolling average actual hourly performance score for the last 100 hours a resource has operated on the specific signal or If 100 hours of data is not yet available, a weighted average of the average of the three initial or requalification scores that are then averaged with any available actual hourly performance scores
- Historic performance scores are calculated upstream of the Market Clearing Engine
- Existing Manual language does not address what score to use if system failure or other issue prevents the latest performance score from being transferred to the Market Clearing Engine

New paragraph proposed to be added to 3.2.9 Regulation Market Operations:

The historic performance score is calculated upstream of the market clearing process as discussed in PJM Manual 12: Balancing Operations, Section 4.5.5 Disqualification and Requalification of a Resource. If the daily historic performance scores for an operating day are not available due to a system failure or other issue that affects the calculation of the historic performance scores for all resources, the latest available historic performance scores from the last three days will be used. If no historic performance scores are available from the last three days, then a default value of 1 will be used.

- Section 2.2 of Manual 13 defines the conditions that set the Reserve Requirement
 - Based on unit output as well as system topology configurations
- Market Clearing Engines cannot identify the topology configurations on its own
 - PJM Markets relies on PJM Operations to identify and communicate to Markets all possible contingencies that result from topology configurations (i.e. outage conditions, station with multiple generators but single feed to the grid)
 - Market staff must then add those possible contingencies to the market database
 - Market Clearing Engines can then screen for the possible largest single contingency

Proposed revision to Section 4.2.2: Synchronized Reserve Requirement Determination

For the purposes of market clearing, the PJM Primary Reserve and Synchronized Reserve Zone and Reserve Sub-zone Reliability Requirements are based on the greatest MW loss of all potential Largest Single Contingencies on the system as documented in PJM Manual 13: Emergency Operations, Section 2.2. Only those potential largest single contingencies communicated by PJM Operations and modeled in the market clearing software will be eligible to set the reserve requirements used in the market clearing process.

Proposed language: Section 4.2.2.1: Reserve Demand Curves and Penalty Factors

The demand curves for each of these products and locations are similar in that they share the same penalty factors on the Y axis; however, the desired reserve levels on the X axis differ to reflect the reserve requirement differences amongst the reserve products and locations. These demand curves are defined as follows:

- Step 1
 - Penalty Factor = \$850/MWh
 - Desired Reserve MW = locational ~~reserve requirement~~ Reliability Requirement for the specified reserve product as defined in ~~PJM Manual 13: Emergency Operations Section 4.2.2~~ above
- ...
- Step 2
 - Penalty Factor = \$300/MWh
 - Desired Reserve MW = locational ~~reserve requirement~~ Reliability Requirement for the specified reserve product as defined in ~~PJM Manual 13: Emergency Operations Section 4.2.2~~ above plus 190 MW plus any additional reserves that are being carried in anticipation of heavy load conditions, as referenced in Section 4.2.2 above.
- ...

- Manual 11 updates
 - Section 3.2.9 Regulation Market Operations
 - Inclusion of process for addressing regulation historic performance scores for an operating day that fail to bridge over into the market clearing system

 - Section 4.2.2 Synchronized Reserve Requirement Determination
 - Clarifying language on reserve requirement determination for market clearing purposes

	MIC	MRC
First Read	7.10.2019	8.22.2019
Endorsement	8.7.2019	9.26.2019