



Working to Perfect the Flow of Energy

PJM Manual 11:

**Energy & Ancillary Services
Market Operations**

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Forward Market Operations

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Section 3: Overview of the PJM Regulation Market

3.2.4 Regulation Requirement Determination

The total PJM Regulation Requirement for the PJM RTO is determined in whole MW for the on-peak (0500—2359) and off-peak (0000—0459)-on-ramp and off-ramp periods of day. Further detail can be found in Manual 12, Section 4.4.3 Determining Regulation Assignment. Demand Resources will be limited to providing 25% of the regulation requirement.

3.2.5 Regulation Obligation Fulfillment

LSEs may fulfill their regulation obligations by:

- Self-scheduling the entity's own resources;
- Entering contractual arrangements with other market participants; or
- Purchasing regulation from the regulation market.

3.2.6 Regulation Offer Period

Resource owners wishing to sell regulation service must at least supply a cost-based regulation offer reflecting both Regulation capability offer cost and the Regulation performance cost of the resource by 1415 the day prior to operation, and the remainder of the necessary data prior to Regulation market closing as stated above in the Regulation Market Date Timeline section.

Regulation offers are locked as of 1415 the day prior to operation. The Markets Database is generally unavailable for updates to offers for the next Operating Day between 1030 and the time the office of interconnection posts the results of the Day-ahead Energy Market for that Operating Day while the Day-ahead market is being cleared. All resources listed as available for regulation with no offer price have their offer prices set to zero.

3.2.7 Regulation Market Clearing

Section 6: Reserve Requirements in PJM Energy Markets

6.1.1 PJM Regulation Requirement

The total PJM Regulation Requirement for the PJM RTO is determined in whole MW for the ~~on-peak (0500—2359) and off-peak (0000—0459)~~ on-ramp and off-ramp periods each day.

The PJM RTO on-peak Regulation Requirement Further detail is described in Manual 12 – Balanceing Operations, Section 4.4.3 Determining Regulation Assignment.

PJM Actions:

- PJM clears the Regulation Market by establishing the list of resources to provide regulation for the next operating hour and by calculating the Regulation Market Clearing Prices (RMCCP and RMPCP) every 5 minutes, then averaging for the hour as defined in Section 3 of this Manual.
- Hourly participant Regulation obligations are determined after-the-fact, based on the LSE's actual load ratios. Participants can estimate their share of the PJM Regulation Requirement in advance by comparing their hourly load forecast to the PJM hourly load forecasts provided by the PJM

PJM Member Actions:

- PJM Members submit Individual Synchronized Reserve and Regulation offer data for each Resource that is available to provide synchronized reserve and/or regulation (for generation or demand resources meeting the Regulation quality standard and Synchronized Reserve quality standard), differentiated as self-scheduled, External Transaction sale/purchase (identifying seller and buyer) and available for PJM RTO-scheduling. This information is maintained within the PJM Markets Gateway Web site and is passed to the PJM Ancillary Service Optimizer (ASO). Exhibit 8 summarizes this information.
- PJM Members update regulating resource operating limits and availability in the PJM Markets Gateway Web site