PJM Manual 12:

Balancing Operations
Revision: 52
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4.1.2 Loading Reserves

During disturbance conditions (e.g., loss of generation and/or transmission resources), Synchronized Reserve and, to the extent necessary, Non-Synchronized Reserves are used to recover the ACE so that tie line schedules are maintained. Depending on system conditions, manual methods may be used to accomplish this recovery. Based on system conditions and the ability of regulation to recover, PJM operators will evaluate the need to implement its Contingency Reserve upon the contingent loss of generation.

PJM Actions

- PJM dispatcher determines the approximate amount and location of lost generation, and the amount of Synchronized Reserve that must be loaded to:
  - Correct for the sudden loss of generation located within the PJM Balancing Authority Area (as indicated by the PJM Balancing Authority's ACE and system frequency deviations)
  - Return interchange transfers or other thermal or reactive limitations to within the appropriate limits
- Implement ~~100 percent~~ Synchronized Reserve and/or Quick Start Reserves if there is insufficient regulation and economic generation to recover the ACE within DCS (BAL standards). A Reportable Balancing Contingency Event is the lesser of 900 MWs in the Eastern Interconnection or 80 percent of the Most Severe Single Contingency.
- PJM dispatcher will initiate the event by entering the desired quantity of reserves to be deployed (either in MW or % of reserves held) through a reserve deployment application and selecting the appropriate ~~Synchronized~~ Reserve Zone or sub-zone ~~in the PJM EMS~~. This action will trigger the following:
  - PJM central automatic generation control application will calculate the pro rata reserves to be deployed on each resource.
  - For generation resources, the reserve deployment MW will be added to the current telemetered output of each resource and new basepoint signals will be immediately sent out. ~~send an initiating signal~~
  - A signal will be transmitted indicating that there is an active reserve event to resource owners capable of receiving the signal via any existing EMS datalinks established between PJM and the resource owners using ICCP or DNP3 protocols.
  - For demand response resources, the reserve deployment instructions and notification of the active ~~spin~~reserve event will be published to DR Hub.
- PJM dispatcher will follow up with a PJM ALL-CALLMessage requesting resource owners with a Synchronized Reserve Commitment to load a percentage ~~(25, 50, 75, or 100 percent)~~ of the Reserve ~~(typically 100 percent)~~ in the appropriate ~~control~~ reserve zone or reserve sub-zone(s). ~~PJM has several Synchronized Reserve market areas.~~ The dispatchers will select the most

effective response respecting the requirements of the regional reserve sharing programs in which PJM is a participant.

- If specific equipment is excluded from the request, the PJM dispatcher calls the appropriate resource owner immediately following the PJM ALL-CALL message.
- If transmission limits exist, or may be caused by loading Synchronized Reserve and Non-Synchronized Reserve in certain geographic areas or control zones, the PJM dispatcher specifies the areas or control zones that are to be included in the request for Synchronized Reserve.
- If the PJM dispatcher anticipates that loading of Synchronized Reserve may continue for longer than 10 minutes, the PJM dispatcher includes this statement in the PJM ALL-CALL message.
- The PJM dispatcher contacts external systems to implement shared reserves (as required).
- PJM dispatcher also requests the loading of an appropriate amount of Non-Synchronized Reserve (as required).
- If the PJM dispatcher determines that the Synchronized Reserve that is being loaded is not sufficient to recover the system from a facility malfunction or failure, the PJM dispatcher requests Synchronized Supplemental Reserve to be loaded (as required).
- As the resource owner dispatchers load the reserves, the PJM dispatcher evaluates the effect. The PJM dispatcher surveys the resources loaded and determines generation that is needed to remain loaded and the replacement resources that can be returned to normal status so that the PJM Balancing Authority load can be economically carried at a new price level.
- The PJM dispatcher cancels the requests, as appropriate.

PJM Members Actions

- The basepoints transmitted to generation resources will reflect the Synchronized Reserve deployment instructions, and generation resources shall follow their basepoints. Once the event is cancelled by PJM Dispatch, the basepoints will reflect a return to normal dispatch, and generation resources shall continue to follow their basepoints.
- Resource owners that have a Synchronized Reserve assignment but do not receive the updated basepoint, for example because of a ICCP or DNP3 communication failure, elect to use their assets to respond to an event shall, without regard to price and as quickly as possible, load their assigned requested percentage of Synchronized Reserves and Non-Synchronized Reserve immediately after receiving either the PJM ICCP signal, DNP3 signal, or PJM All-Call Message. PJM Members responding to the event will continue to load resources until directed by the PJM dispatcher to discontinue. Resources providing Regulation service should only provide Synchronized Reserves to the extent that they can quickly resume accurate Regulation control following the event.
- Upon cancellation, the Generation Owner dispatchers unload the Synchronized and NonSynchronized Reserve, as directed by the PJM dispatcher.
- Demand response resources shall immediately deploy reserves as instructed through DR Hub. Once the event is cancelled and the cancellation notification is transmitted through DR Hub, demand response resources shall return to normal operations.
- If a resource is unable to accommodate a partial deployment of reserves for any reason during an event where less than 100% of available reserves are deployed by PJM dispatch, the resource shall follow the deployment instruction as closely as possible while providing no less than the

deployment instruction. Resources shall not be penalized for any reserve MWs deployed that exceed the deployment instruction.