



# PJM Settlements: Generator Deviations for Balancing Operating Reserve Charges

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## PJM Settlements:

- Understanding generator deviations for balancing operating reserve charges
- Incentives for resources to update offers

- Dispatchable pool-scheduled generation resources and dispatchable self-scheduled generation resources that follow dispatch are not assessed balancing Operating Reserve deviations.
- Generation resources that do not follow dispatch are assessed balancing Operating Reserve deviations.
  - The deviation MW used to assess deviation charges is calculated by comparing the resource's real-time output to the desired MW level, which in most cases is based on real-time prices and dispatch instructions.
  - This creates greater incentive for generators to follow PJM real-time dispatch instructions rather than their day-ahead schedule.
- The deviation charge calculation recognizes that generators are not able to follow the dispatch signal perfectly and excuses small deviations.



# Desired MW Utilized for Deviation Calculation

Currently PJM calculates how well a unit follows dispatch by comparing its RT MW to one of these three desired metrics to determine deviations:

Methodology	Description	When Used as Desired MW
Dispatch Signal	Dispatch Signal calculated by RT SCED (Real-Time Security Constraint Economic Dispatch) and sent to generators.	<ul style="list-style-type: none"><li>Dispatch Signal MW is less than or equal to the ramp-limited desired MW</li><li>Dispatch Signal MW is greater than the ramp-limited desired MW and the resource's Real-time MW is greater than the ramp-limited desired MW</li></ul>
Ramp Limited Desired (RLD) <i>(used most frequently)</i>	The MW value that the unit should have achieved between Dispatch Signals or RT SCED case approvals.	Generally used when resource is "following dispatch" within +/- 20%
LMP Desired	The LMP Desired is the MW level on the incremental offer curve where the Dispatch Run LMP intersects the offer curve. Not a ramp-limited value.	<ul style="list-style-type: none"><li>Percent off dispatch is greater than 20% or</li><li>Resource's Fixed Gen Flag is set in Real-time but not Day-ahead or</li><li>Resource clamps its economic limits from Day Ahead to Real-Time</li></ul>

PJM conducts Balancing Operating Reserve Cost Analysis to determine reason why Operating Reserve credit is earned so charges can be properly allocated

- Total daily cost of operating reserve in balancing market related to resources identified as **Credits for Reliability** is allocated based on regional shares of real-time load (without losses) plus exports
- Total daily costs of BOR related to resources identified as **Credits for Deviations** is allocated based on regional shares of real-time locational deviations from day-ahead scheduled or otherwise desired quantities
  - **Cleared generation offers not following PJM dispatch instructions**
  - Cleared Demand Resources not following cleared Day-Ahead offer
  - Cleared INC offers and external purchase transactions
  - Cleared demand bids, DEC bids, UTCs, and external sale transactions



- RTO region defined as East region, West region, & exports that are at interfaces or hubs not completely contained in either East or West region
- West region defined as AEP, AP, ATSI, ComEd, DEOK, DUQ, Dayton, & EKPC transmission zones
- East region defined as AE, BGE, DOM, Penelec, PEPCO, Meted, PPL, JCPL, PECO, Delmarva, PSEG, & Rockland transmission zones

Deviation Charge rates are relatively small given the costs assigned to deviations are spread across all injections, withdrawals and generation deviations.

1	2	3
Deviations are agnostic per resource type	Regional rates for BOR Deviations are minimal and incentives to update resource parameters are not driven via settlements calculations	Existing business rules and calculations may be subject to change in the MIC special sessions “Operating Reserve Clarification for Resources Operating as Requested by PJM”

OA Schedule 1 Section 3.2 (o)

- [PJM Operating Agreement](#)

M28 - 5.3.2.3 Deviation Calculations for Generating Resources

- [PJM Manual 28](#)

Data Miner

- [Data Miner Operating Reserve Deviation Rates](#)

MIC references and presentations

- [MIC Operating Reserve Clarification for Resources Operating as Requested by PJM](#)
- [MIC Special Operating Reserve Clarification Issue Charge Problem Statement](#)
- [Tracking Ramp Limit Desired Metric](#)
- [Operating Reserve Clarification Incentives Education](#)



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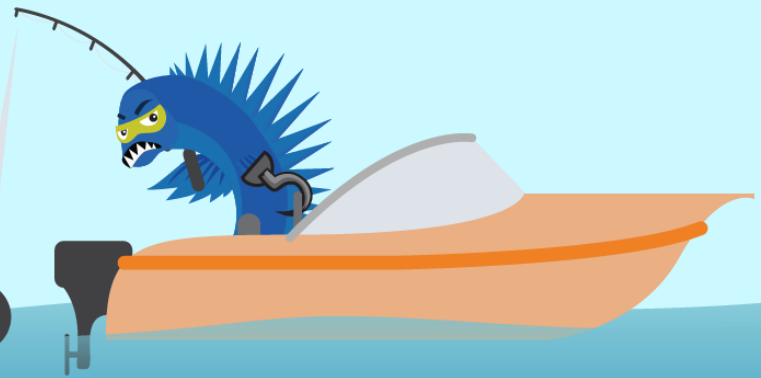
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