



Accounting for Ancillary Service Assignments in the Balancing Operating Reserve Calculations

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- Opportunity Cost Review
- Reserve Examples (Excel)

- Proposed updated Balancing Operating Reserve make whole calculation:
 - Step 1: Calculate make whole credit for the segment using ***Tracking Desired MW***.
 - Step 2: Calculate make whole credit for the segment using ***Actual RT MW***.
 - Step 3: Compare and set the resource's credit equal to the ***lesser*** of the two values.
- The effect of this change is that resources are made whole to their costs, but the make whole is limited to the amount of uplift the resource would have been entitled to if the resource followed dispatch.
 - When a resource offers an ancillary service or adheres to a manual dispatch directive from PJM, it's crucial that the make whole calculations accurately represent the desired MW output. This is to prevent any discrepancies, such as double counting or underestimation of profits or costs, that could arise from credits paid through other markets / line items on the billing statement.



Make Whole Credit Using Tracking Desired MW

- Tracking Desired MW acknowledges ramping limitations and reflects the economically desired value over a period of time.
- If a resource is directed by PJM to deviate from the economically desired value, the Tracking Desired MW must be adjusted to reflect the requested action. This allows the measurement of following dispatch to be maintained.
- The adjusted Tracking Desired MW is defined as the point at which the resource is able to provide the ancillary MW assuming the economic set point is equivalent to the originally calculated Tracking Desired MW.

Action	Tracking Desired MW Impact (Used in Step 1 Calculation)
PJM manual dispatch up or down	Reflects desired value based on eco min/max or MW overrides
PJM assigned regulation	Adjusted up or down, as necessary, to the level at which the resource can provide the assigned regulation MW (regulation set point)
PJM assigned reserves	Adjusted down, as necessary, to the level at which the resource can provide the assigned reserve MW (reserves set point)



Double Counting Opportunity Costs

- Ancillary Service Market or Energy LOC settlements rules compensate a resource for foregone profits or additional costs (opportunity costs) if the resource is directed to deviate from the economically desired value. These opportunity costs reflect the payment required to keep the resource indifferent between providing energy or the requested service.
- To avoid the double counting of profit or costs between markets, the Balancing Operating Reserve calculations must account for the receipt of any credits covering these opportunity costs via other markets when calculating net revenues.

Action	Make whole calculation using Tracking Desired MW (Step 1)	Make whole calculation using Actual RT MW (Step 2)
PJM manual dispatch down	Includes opportunity cost from Energy LOC credit based on desired MWs	Includes opportunity cost from Energy LOC credit based on actual MWs
PJM manual dispatch up	No separate LOC payment. No additional adjustment needed.	No separate LOC payment. No additional adjustment needed.
PJM assigned regulation	Includes potential regulation opportunity cost using historical performance score	Includes actual opportunity cost using actual performance score
PJM assigned reserves	Includes potential reserves opportunity cost using actual reserve assignment	Includes actual reserves opportunity cost using capped actual reserve assignment

Operating Reserve Clarifications

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Operating Reserve Clarifications

Potential Solution Options – Desired MW Calculations



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