

RT Secondary Reserve Opportunity Costs in Settlements - Identification of Offline Generation Resources

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February 19, 2026

- Tariff, Attachment K-Appendix, Section 3.2.3A.01(f)(v) and the parallel provisions in Schedule 1 of the OA state that Secondary Reserve market opportunity costs for generation resources not synchronized to the grid, such as offline resources, should be zero.
 - (f)(v) The opportunity costs for Economic Load Response Participant resources **and generation resources not synchronized to the grid shall be zero**, except that Economic Load Response Participant resources may have a day-ahead opportunity cost as determined in subsection (f)(i) above.
- Neither the tariff nor the manuals specify how the online/offline determination should be made for clearing or settlement.
- Current Secondary Reserves rules implemented on 10/1/2022.

Secondary Reserves Offline RT Opportunity Cost

Market Clearing (RT SCED)

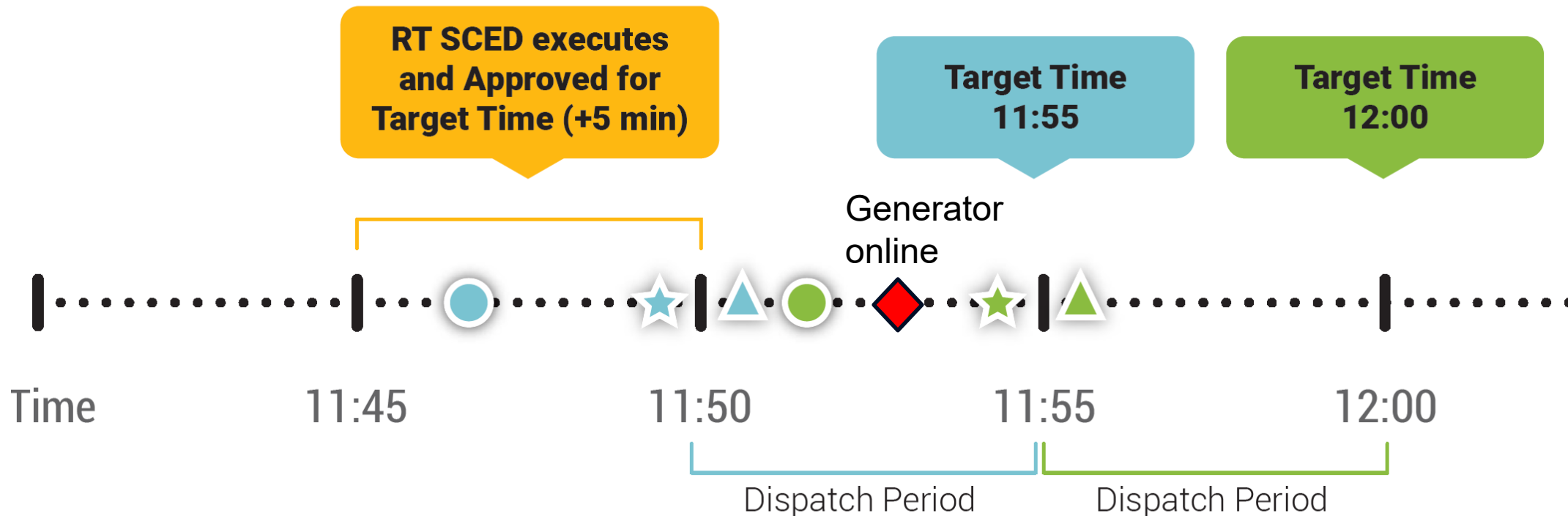
- Executes on a ten minute ahead basis
- Calculates energy dispatch and RT Secondary Reserve assignments based on inputs at time of case execution.
- Source for generator online/offline status is the real-time output from the state estimator application
- Offline generators with Secondary Reserve assignments have zero opportunity costs in clearing.

Settlements

- Settlements are conducted using generator revenue quality meter data reported via Power Meter (“Revenue Data for Settlements”).
- Source for generator online/offline status is the Revenue Data for Settlements
- Offline generators with Secondary Reserve assignments have zero opportunity costs in settlements.

Problem/Opportunity:

- Timing and source data differences have resulted in resources being cleared as offline with zero opportunity costs, however non-zero real-time opportunity costs were calculated in settlements if the resource came online in the intervening ten minutes as reported via Revenue Data for Settlements.
- PJM is proposing to define and enhance the settlements methodology used to identify resources as offline.



- RT SCED Case Executes
- ★ RT SCED Case Approval
- ▲ Dispatch LPC Case Executes

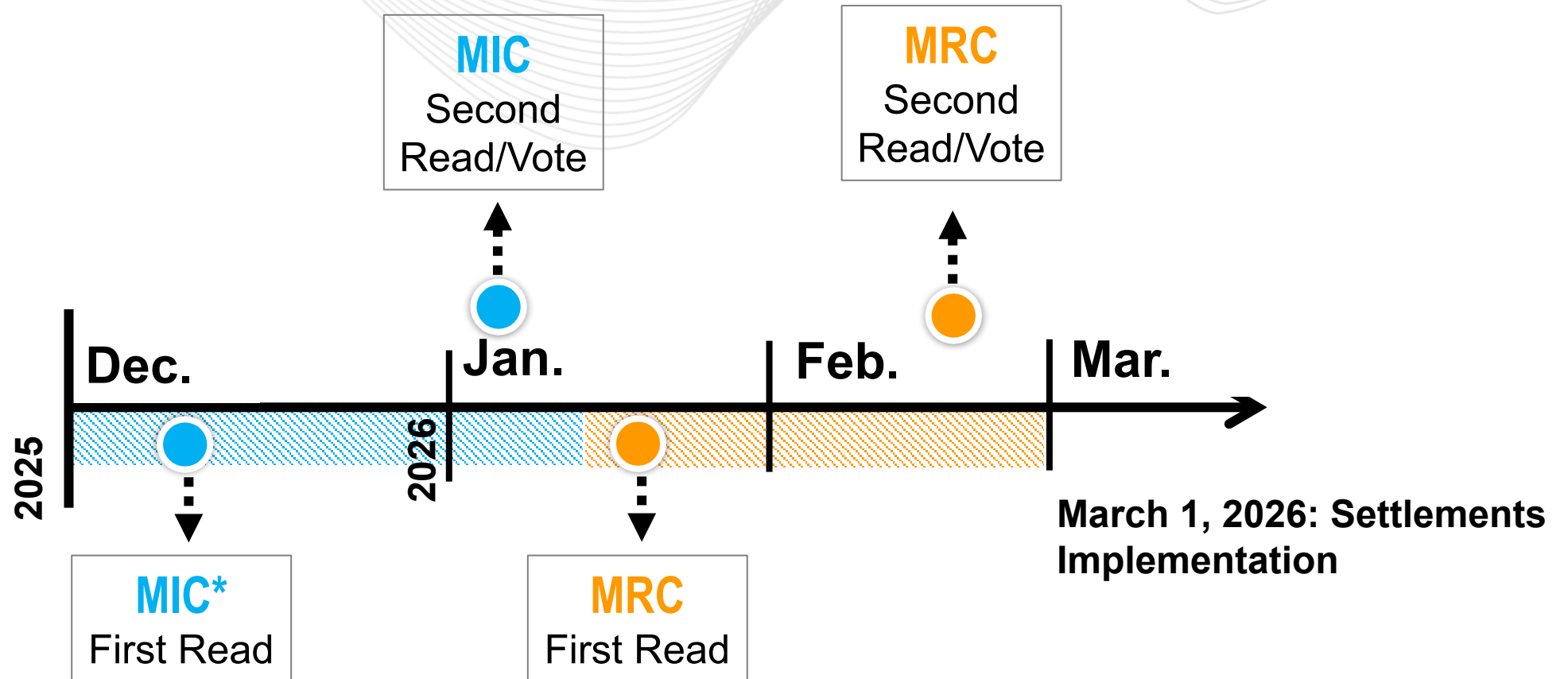
RT SCED: Resource is offline and clears with an offline SecR assignment and \$0 opportunity cost for 11:50 – 11:55 and 11:55 – 12:00

Settlements: Resource comes online at 11:53 and reports non-zero generation output to settlements for 11:50 – 11:55 and 11:55 – 12:00. Eligible for SecR opportunity cost as an online resource.

- PJM proposes to enhance the settlement methodology used to identify generation resources as offline for the purposes of calculating RT Secondary Reserve opportunity costs.
 - Use RT SCED data in settlements to identify a resource as offline. Provides a consistent approach to offline status between market clearing and settlements.
 - Define settlements methodology in Manual 28

- Manual 28, Section 19.2.3

- For the following resource types, the Real-time Secondary Reserve Opportunity Cost is calculated as follows:
- Resources providing secondary reserves in synchronous condensing mode without a Real-time Synchronized Reserve assignment = $((\text{Real-time Condense Energy Use} - \text{Day-ahead Condense Energy Use}) * \text{RT LMP at the generation bus}) + \text{any additional Condense Start-up Cost in excess of Day-ahead Condense Start-up Cost}$
- Resources providing secondary reserves in synchronous condensing mode with a Real-time Synchronized Reserve assignment = \$0
- Resources with a Real-time Secondary Reserve assignment that were cleared and committed as offline resources ~~in offline mode~~ = \$0



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<ul style="list-style-type: none"> Scenarios identified where generators cleared as offline with \$0 opportunity costs for RT Secondary Reserves, but due to timing differences were treated as online and eligible for RT Secondary Reserve opportunity costs in settlements. 	<ul style="list-style-type: none"> Opportunity to define and enhance settlements methodology 	<ul style="list-style-type: none"> PJM proposes settlements enhancement to use RT SCED case data to determine offline status consistent with market clearing for purposes of calculating RT Secondary Reserve opportunity costs.

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**RT Secondary Reserve Opportunity Costs in
Settlements - Identification of Offline Generation
Resources**

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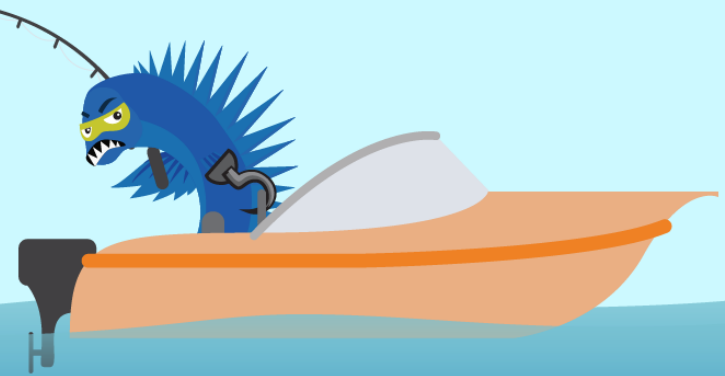
Acronym	Term & Definition
RTSCED	Real-Time Security Constrained Economic Dispatch is the application use to dispatch in Real-Time. It's based on the least costly means of serving load and meeting reserve requirements at different locations in the PJM Region based on forecasted operating conditions on the power grid.

[PJM Glossary](#)

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