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

Suzanne Coyne
Market Settlement Development

Market Implementation Committee

January 7, 2026

# Background

- 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.

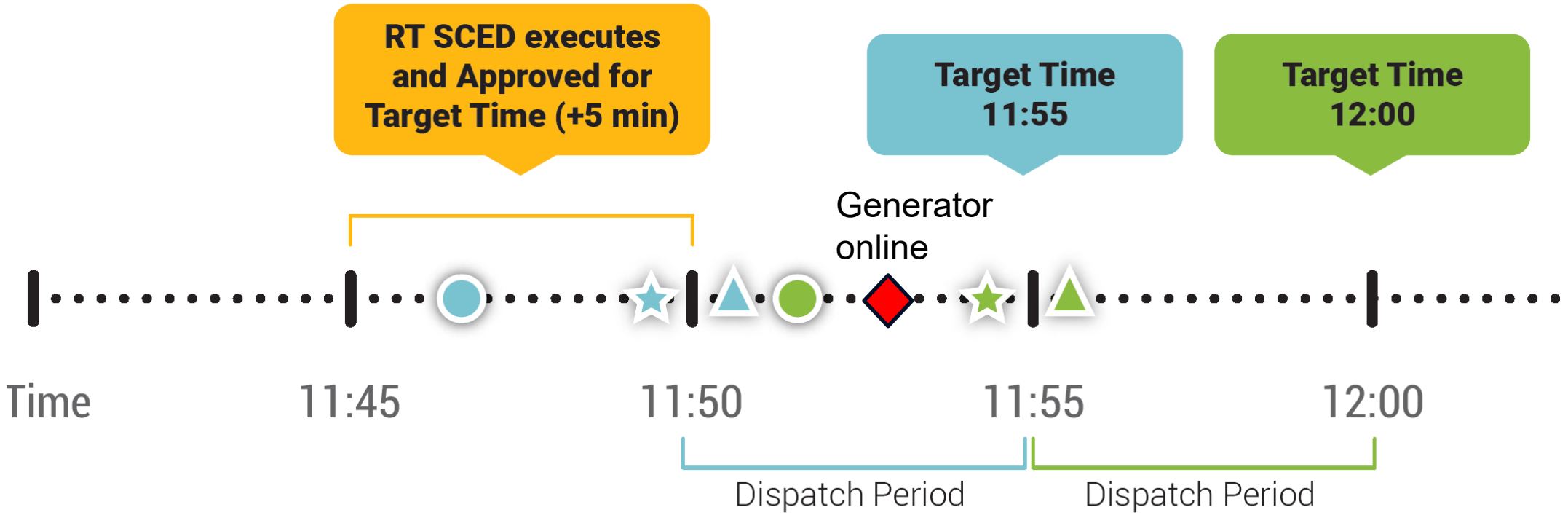
## Settlements

- 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 a quick fix to define and enhance the settlements methodology used to identify resources as offline.

# Current Implementation




- ● 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.

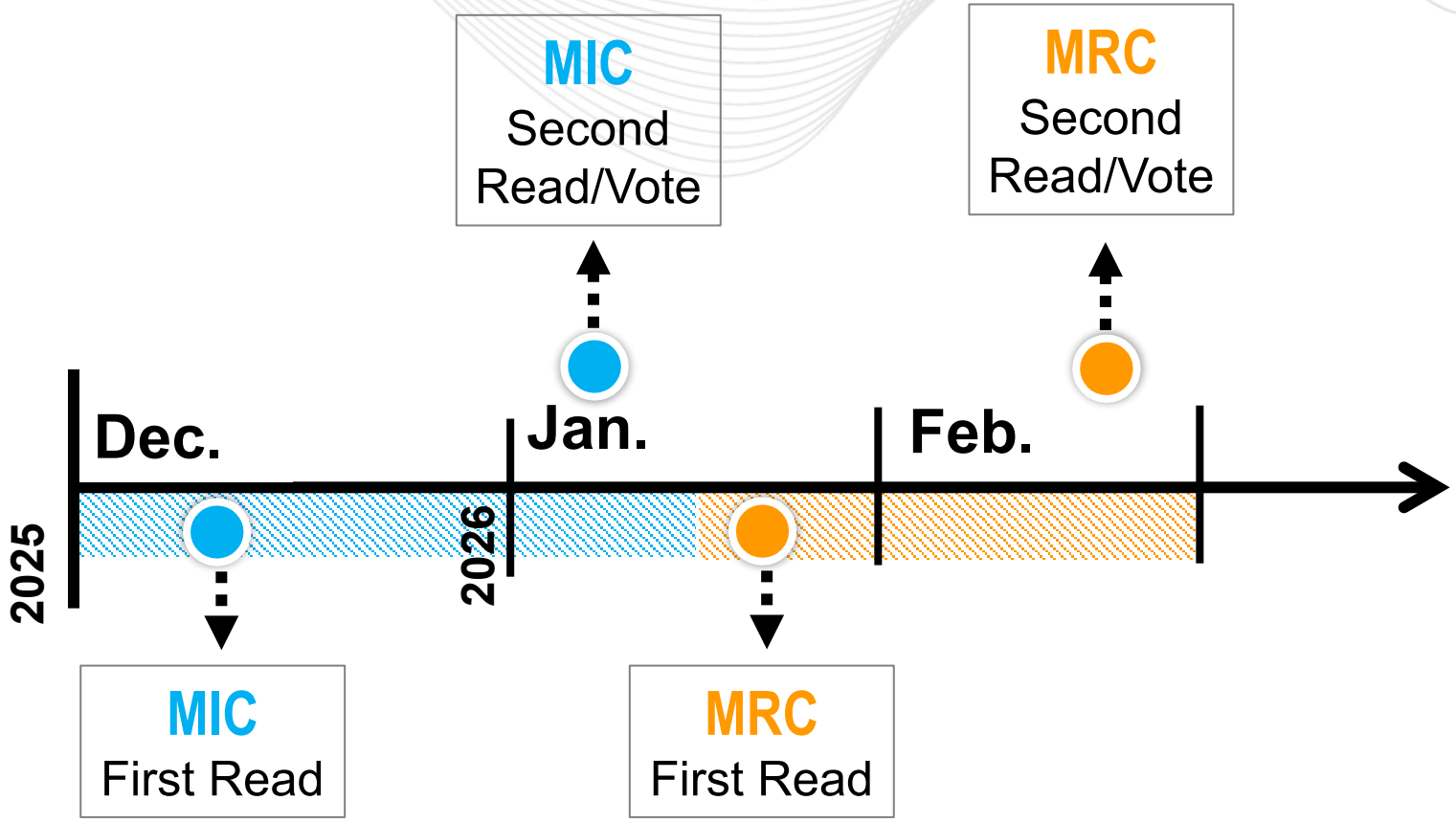
# Proposed Enhancement

- PJM proposes using the Quick Fix process 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

# Proposed Manual 28 Language

- 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 = ((Real-time Condense Energy Use – Day-ahead Condense Energy Use) * RT LMP at the generation bus) + 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

# Review/Endorsement Timeline for Issue Charge and Solution



# Key Takeaways

| 1 | 2 | 3 |
|---|---|---|
| • 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. | • Opportunity to define and enhance settlements methodology | • 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. |

# Contact

Chair:
Jason Shoemaker,
Jason.Shoemaker@pjm.com

Secretary:
Stefan Starkov, Stefan.Starkov@pjm.com

SME:
Suzanne Coyne, Suzanne.Coyne@pjm.com

**Secondary Reserve Lost Opportunity Cost Offline Status Clarification**

Member Hotline

(610) 666-8980

(866) 400-8980

custsvc@pjm.com

# Acronyms

| 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

# PROTECT THE POWER GRID

# THINK BEFORE YOU CLICK!

Be alert to malicious phishing emails.

**Report suspicious email activity to PJM.**

(610) 666-2244 / it_ops_ctr_shift@pjm.com