Updates to PJM's Package

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April 13, 2026

Introduction

- Based on feedback PJM has received both in the RCSTF and in follow-up conversations with stakeholders, PJM has made some updates to its solution package
- These updates include:
  - Adjusting Ramp/Uncertainty Reserve Requirements to reflect resources that have been committed to the system and are starting up
  - Allocating reserve costs for all reserve services to exports as well as real-time load
  - An adjustment to the penalty rate for non-performance of resources with a Day-Ahead Schedule Reserve assignment
  - Introducing a minimum floor on the 30-Min Reserve Requirement at the largest single contingency

Reflecting Resource Commitment in Reserve Quantities

What was the previously presented design?

When calculating the ramp component of the Ramp/Uncertainty Reserve requirements, PJM previously proposed calculating this quantity based on the difference in the net-load forecast for the forward interval minus the forecast in the nearer interval. For example, for 10-Min RUR, this would mean taking the net-load forecast for 10 minutes beyond the target time and subtracting the net-load forecast at the target time. PJM did not include a provision for adjusting this quantity based on resources that had been committed to the system and were starting up.

What update is PJM making to this design?

PJM now proposes to adjust this expected ramp quantity based on the expected ramp of resources that have been committed to the system and are in start up mode. This will be done by using the output of these resources as reflected in the state estimator case and projecting their expected future output based on their bid in ramp rates.

What is the rationale for this change?

This was a change recommended in the March 17th, 2026, RCSTF, and PJM agrees that the suggested change makes sense given that these resources are expected to help serve net-load in future intervals and therefore reduce the need to provision reserves on other resources to meet this future demand.

Reserve Cost Allocation to Exports

What was the previously presented design?

PJM previously proposed allocating all reserve costs to real-time load based on Load Ratio Share. This would have been an extension of PJM's status quo reserve cost allocation rules.

What update is PJM making to this design?

PJM now proposes to allocate all reserve costs to both real-time load and exports based on Load Ratio Share both for PJM's existing and new reserve services.

What is the rationale for this change?

This was a change recommended in the March 17th, 2026, RCSTF. PJM agrees that the suggested change makes sense given that exports are also a beneficiary of PJM's reserve procurement and PJM's proposed cost allocation approach is based on allocating costs to service beneficiaries. Additionally, PJM has reviewed the reserve cost allocation practices of its neighbors, MISO and NYISO, and found that this change is consistent with their practices as detailed on the following slide.

Reserve Cost Allocation Rules in MISO and NYISO

MISO

MISO allocates the cost of its reserve services, including Contingency Reserves, Supplemental Reserves, Up Ramp Capability, Down Ramp Capability and Short-Term Reserves, to its Load Serving Entities and Exporting Entities.

References:

- *MISO Open Access Transmission Tariff*
  - *See Schedule 5.III, Schedule 6.III, Section 40.3.3.1.b, and Schedule 51.III*

NYISO

Operating Reserve Charges are allocated to Transmission Customers and Customers engaging in Export Transactions* and Load Serving Entities.

References:

- *NYISO Open Access Transmission Tariff*
  - *See Schedule 6.5.1*

**Excluding Export Transactions at a CTS Enabled Interface with ISO New England resulting from Exports that are not associated with wheels through New England*

Disclaimer: *Information provided on this slide is based on PJM's best understanding of the MISO and NYISO Tariffs. PJM does not guarantee the perfect accuracy of this information.*

Adjustment to Non-Performance Penalty Rate for DASR

What was the previously presented design?

PJM previously proposed that the consequence of non-performance for resources with a Day-Ahead Scheduling Reserve assignment fails to convert reserves into energy would be that the resource would have to pay for that performance shortfall at a penalty rate set by the greater of a) 1.5 times the Day-Ahead Scheduling Reserve market clearing price and b) 1.25 times the 30-Min Reserve market clearing price.

What update is PJM making to this design?

PJM now proposes to have that penalty rate be set by the greater of a) 1.5 times the Day-Ahead Scheduling Reserve market clearing price and b) **1.5** times the 30-Min Reserve market clearing price.

What is the rationale for this change?

PJM is proposing to make this change because it makes the consequences for non-performance for resources with a DASR assignment equivalent to resources with a 30-Min Reserve assignment.

Setting a Minimum Quantity for the 30-Min Reserve Requirement

What was the previously presented design?

PJM previously proposed allowing the 30-Minute Reserve Requirement to fall below the largest single contingency if the forecasted downward 30-minute net-load forecast was greater than the largest contingency. This would have allowed the 30-Minute Reserve Requirement to go down to as low as 0 MW in times of significant down ramp.

What update is PJM making to this design?

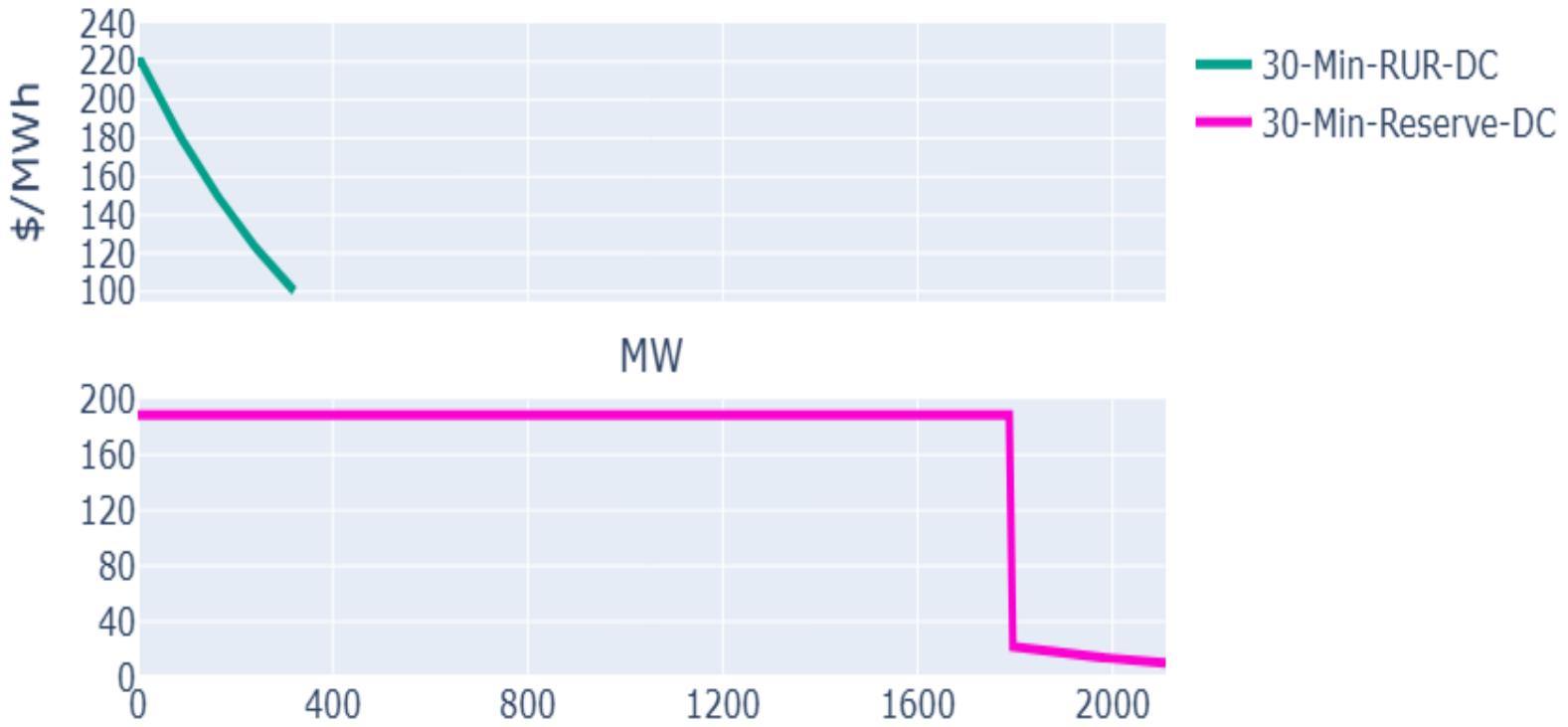
PJM now proposes to introduce a minimum quantity on the 30-Minute Reserve requirement at the largest single contingency. This would mean that the 30-Minute Reserve requirement would never fall below the largest single contingency on the system. How this change will be reflected in the 30-Min Reserve Operating Reserve Demand Curve is provided in the following slides.

What is the rationale for this change?

PJM is proposing this change as a reliability backstop to ensure that PJM always has enough 30-Minute Reserves available to backfill its Synchronized Reserves. PJM believes this is an important update to its proposal, particularly in light of the previously discussed change which will recognize the commitment of resources in setting Ramp/Uncertainty Reserve Requirements.

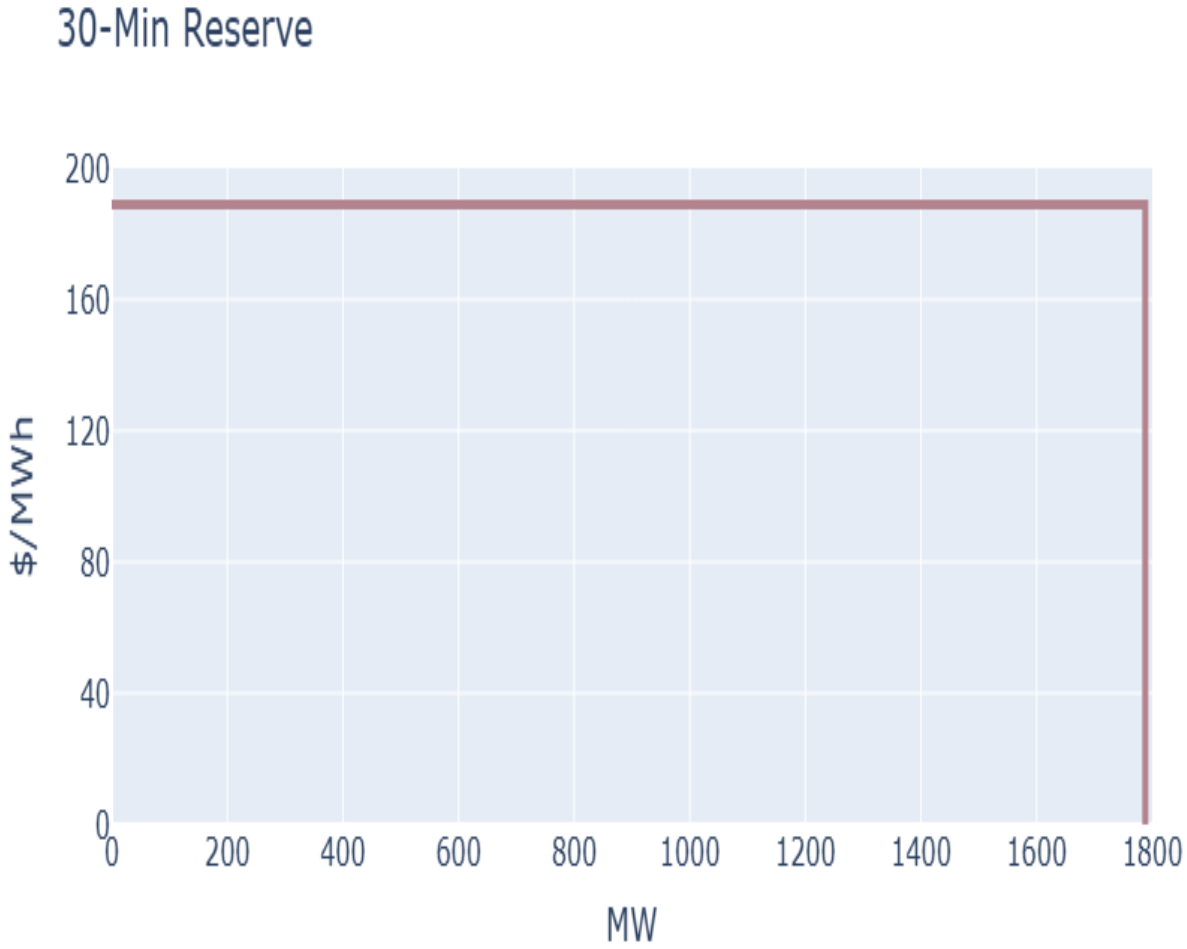
Example June 24, 2025, 20:00: Negative Exp. Ramp & Positive Uncertainty Tail

- 30-Min expected ramp requirement is -769 MW
- 30-Min 95th percentile uncertainty requirement is 1090 MW
- Only the tails of the 30-Min RUR curve and the 30-Min Reserve curve have positive MW segments
- The 30-Min Reserve curve has a right shift by 1,788 MW (MSSC), with the price till MSSC at $190, and the remaining portion is priced at 10% of RUR curve (top)
- The plot shows both curves — 30-Min RUR (top), 30-Min Reserves (bottom)



Example June 24, 2025, 23:00: Negative Net-Load Ramp with No Positive Uncertainty Tail

- The expected 10-min ramp and 30-min ramp requirements are -1,532 MW and -3064 MW, respectively
- The 95th percentile uncertainty requirements for 10-min and 30-min are 549 MW and 822 MW, respectively
- Consequently, there is no 10-Min RUR Up and 30-Min RUR requirement, and therefore, no demand curves for these products
- The 30-Min Reserve demand curve (right) is a single step till MSSC priced at $190
- SR, 30-Min Reserves and 10-Min Down RUR are the only RT reserves that will be procured in this hour



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Updates to PJM's Package

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Acronyms

Acronym	Term & Definition
SR	**Synchronized Reserves** are reserves provided by resources that are synchronized to the grid and can respond within 10 minutes.
RUR	**Ramping/Uncertainty Reserves** are reserves that would be procured to manage forecasted ramp and uncertainty operational flexibility needs.
MW	A **Megawatt** is a unit of power equaling one million watts (1 MW = 1,000,000 watts) or one thousand kilowatts (1 MW = 1,000 KW).

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