

Reserve Certainty Senior Task Force Overview and Proposal

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Markets and Reliability Committee

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Disclaimer: While materials are current at the time of publishing, applicable requirements may change. PJM Governing Documents control.

Comprehensive Topics on Reserve and Energy Market

- [Issue Charge](#) and [Problem Statement](#) approved at September 2023 MRC.

Immediate-Need Scope

Begin immediately, worked over 6 – 9 months

Addresses current Synchronized Reserve performance concerns, observation on reserve price formation implementation, and deployment of reserves

Longer-Term-Need Scope

Begin on 6 – 9 month lag, worked over 12 – 18 months

Addresses future system needs for reserve and flexibility, with evaluation of the Operating Reserve Demand Curve (ORDC), operational metrics, and enhancements or additional market solutions (ramping, multi-interval, etc.)

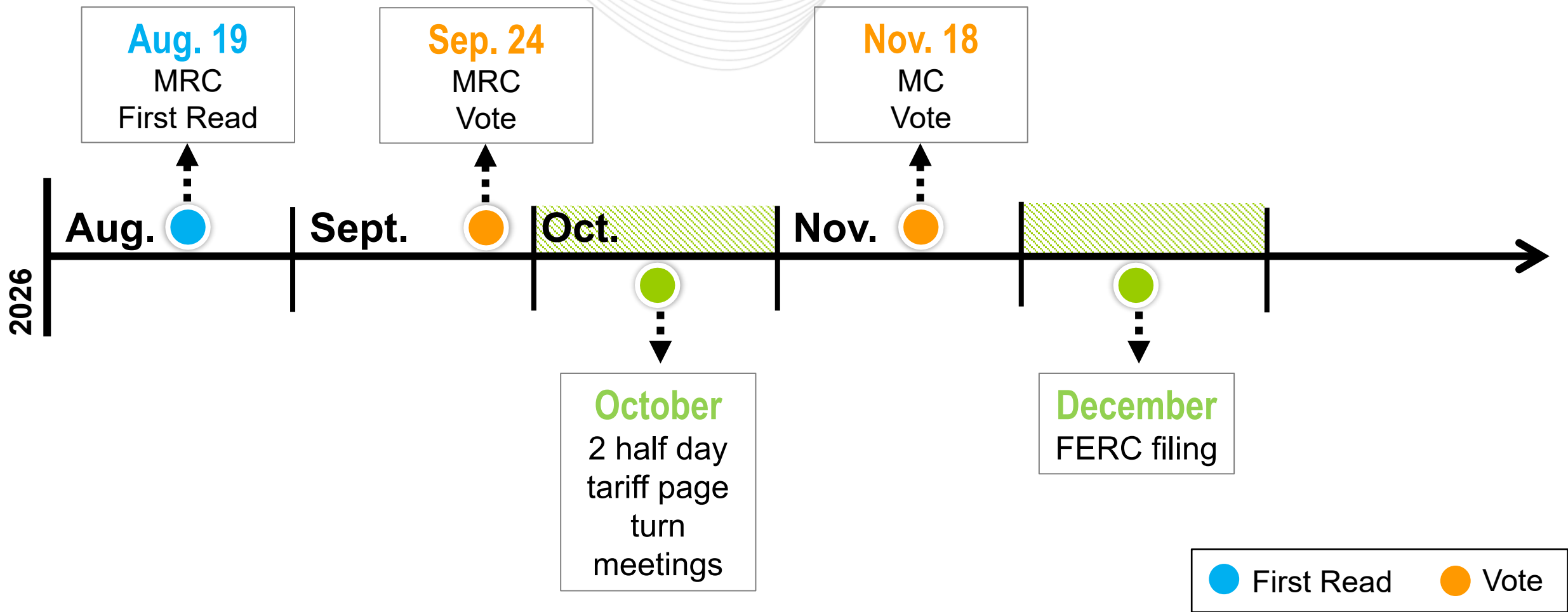
Work on the longer-term scope culminated in an RCSTF vote in July 2026.

- Packages were offered by PJM, the IMM and American Municipal Power.
- The changes in the packages include, but are not limited to:
 - New and/or increased day-ahead reserve market requirements to align operational scheduling needs with the day-ahead market
 - Introduction of new / modified reserve products and services to better position the system to respond to growing ramping and/or uncertainty system needs
 - Eligibility to provide each reserve product, and availability and performance expectations for each product
 - Updates to offer price rules to reflect the cost to provide reserves
 - Changes to the locational procurement of reserves

	PJM Package	AMP Package
Overview	• Introduction of several new reserve products, including: • DA Scheduling Reserves • DA Energy Gap Reserves • DA & RT 10- and 30-minute Ramping and Uncertainty Reserves • Updates to reserve offers, non-performance consequences, and cost allocation; • ORDC changes; • Shift from a sub-zonal to nodal reserve procurement model	Same as PJM package, but without the DA Energy Gap Reserves product
% In Favor	66%	44%
% In Favor over Status Quo	77%	56%

The IMM proposal was split into 3 separate proposals that allowed only portions of the full proposal to be implemented or for the full proposal to be implemented in phases.

	IMM Package B.1 (Changes to Market Inputs)	IMM Package B.2 (Changes to PJM internal systems and processes)	IMM Package B.3 (Changes to market clearing engines)
Overview	Incorporate net load forecast uncertainty into existing reserve products	Package B.1 + Changes to reserve performance evaluation and reserve settlements	Package B.2 + changes addressing Reserve eligibility, inclusion of emergency DR in reserves, reserve subzone use, performance adjustments in resource clearing, and all other changes
% In Favor	22%	12%	11%
% In Favor over Status Quo	25%	14%	13%

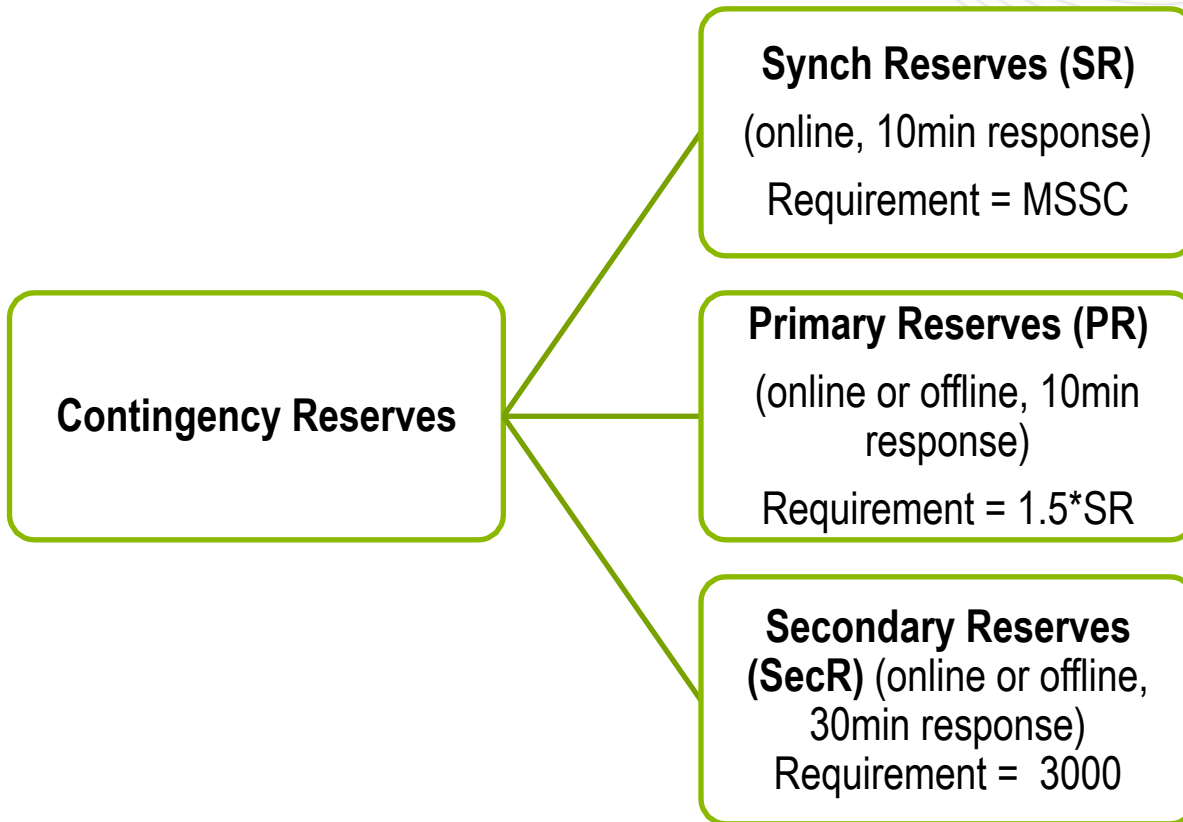


PJM Package Summary

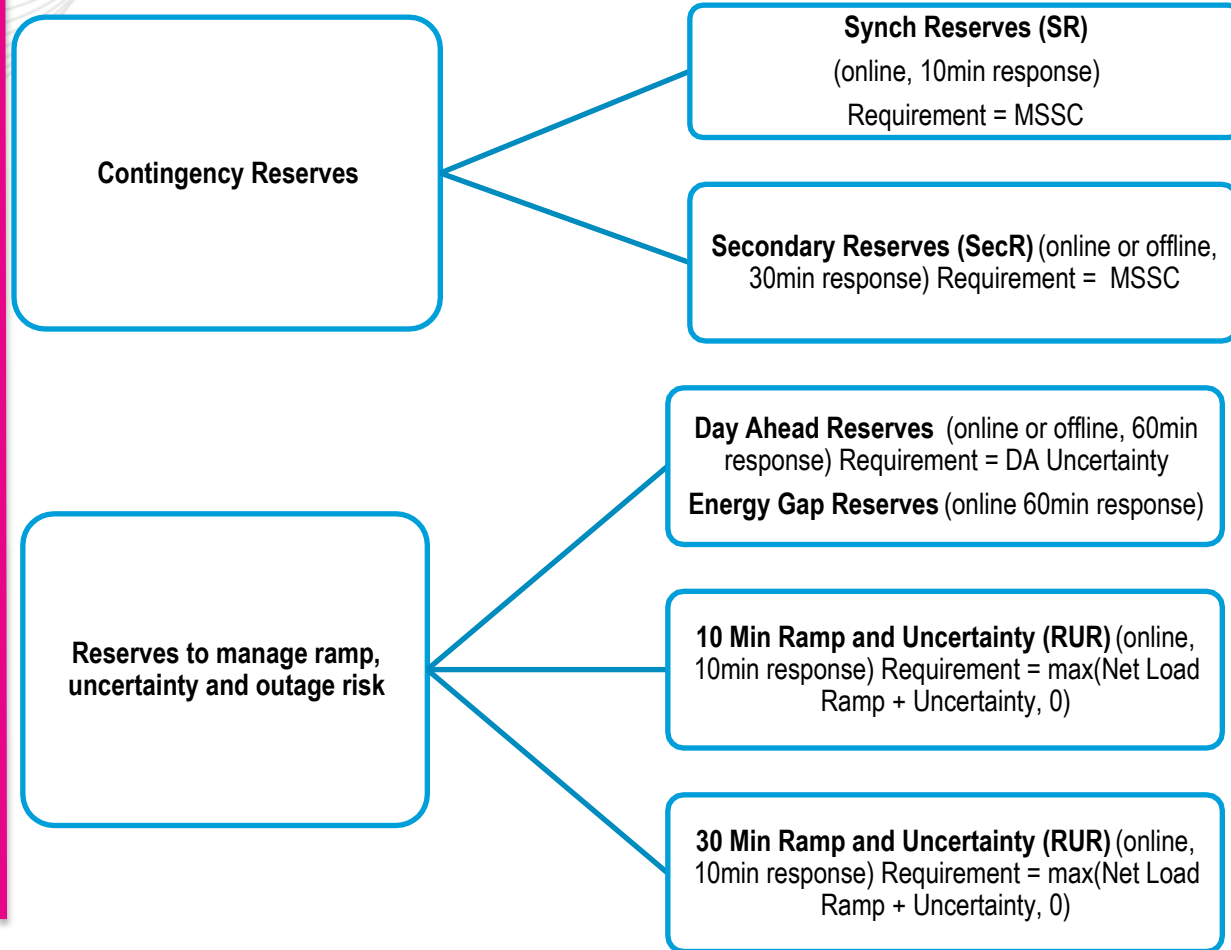
- ☒ Introduction of Ramp and Uncertainty Reserve and risk-based day-ahead reserve services to reflect operational uncertainty and risk
- ☒ Updates to reserve offer rules, consequences for non-performance and reserve cost allocation
- ☒ Changes to PJM's Operating Reserve Demand Curves
- ☒ Unnesting of reserve services to recognize energy endurance needs, particularly when considering energy limited resources
- ☒ New locational design

Current and Proposed Future Reserve Constructs

CURRENT



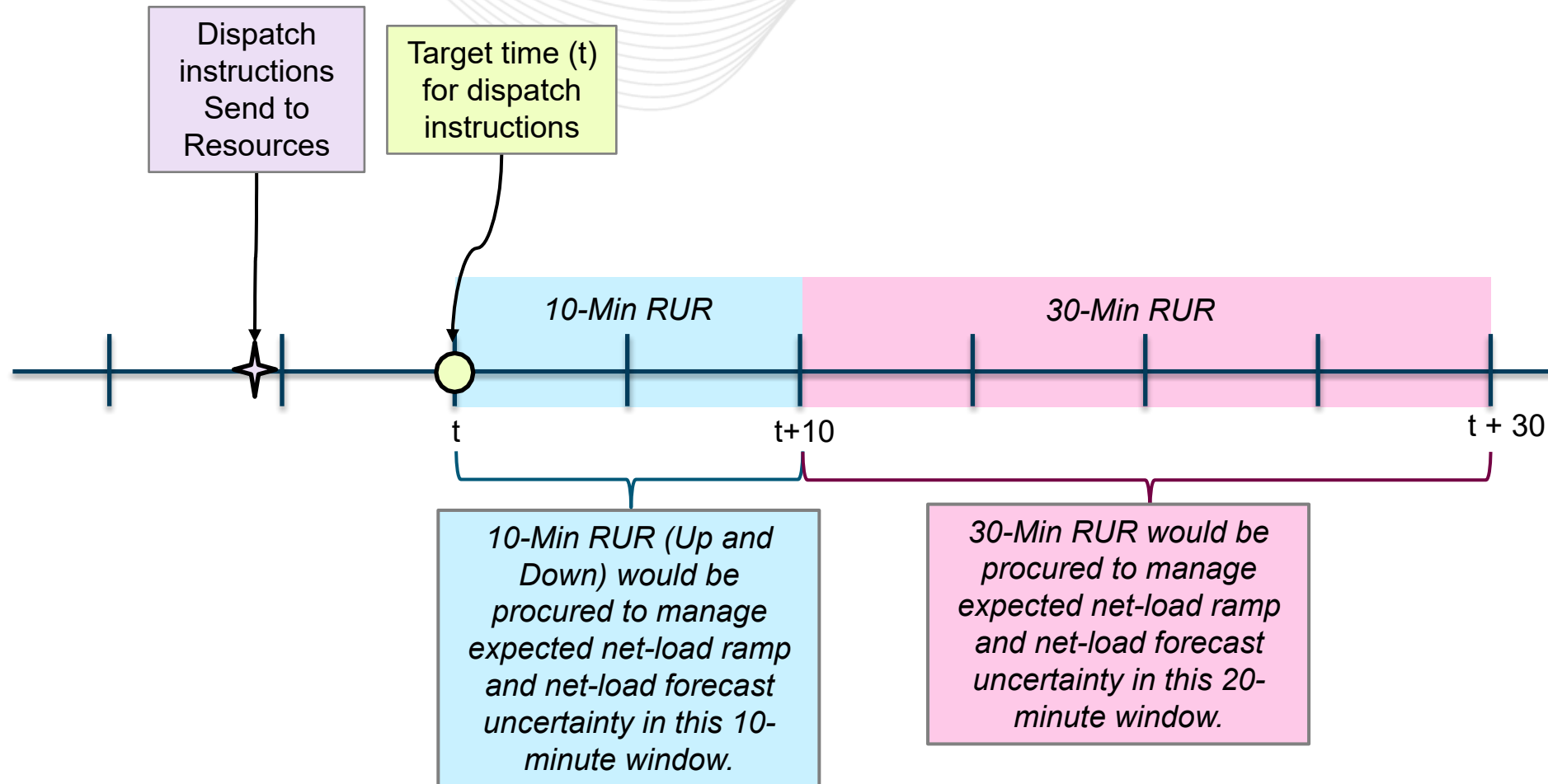
FUTURE



MSSC = Most Severe Single Contingency

Introduction of New Ramp and Uncertainty Reserves

Ramp and Uncertainty Reserve Timing



Performance

Follow PJM's energy dispatch instructions

Soft Offer Caps*

DAM: \$10/MWh **RTM:** \$0/MWh

**Cost-based offers above the soft offer cap may be submitted if justified with documentation*

Resource Eligibility

Resources must be online, able to respond (ramp) within the time to response (10 minutes for 10-Min RUR and 30 minutes for 30-Min RUR) and be dispatchable by SCED.

Requirement

Expected Ramp Over Forward Period + Uncertainty

Uncertainty Calculation

Uncertainty = % Load Forecast Uncertainty x Forecasted Load + % Wind Forecast Uncertainty x Forecasted Wind + % Solar Forecast Uncertainty x Forecasted Solar

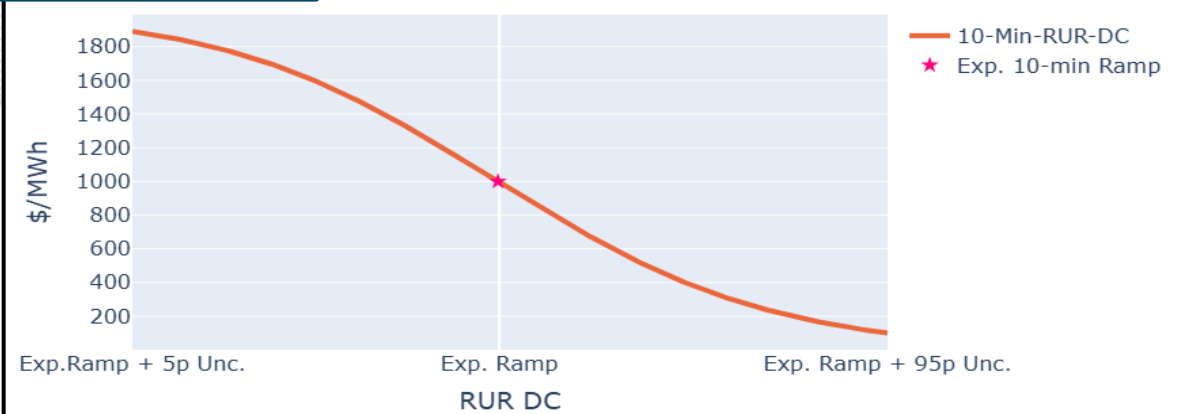
Product	Uncertainty %		
	Load*	Wind*	Solar*
10-Min RUR (Up and Down)	0.4%	1.9%	3.1%
30-Min RUR	0.6%	2.7%	4.0%

** Uncertainty % based on 24/25 data*

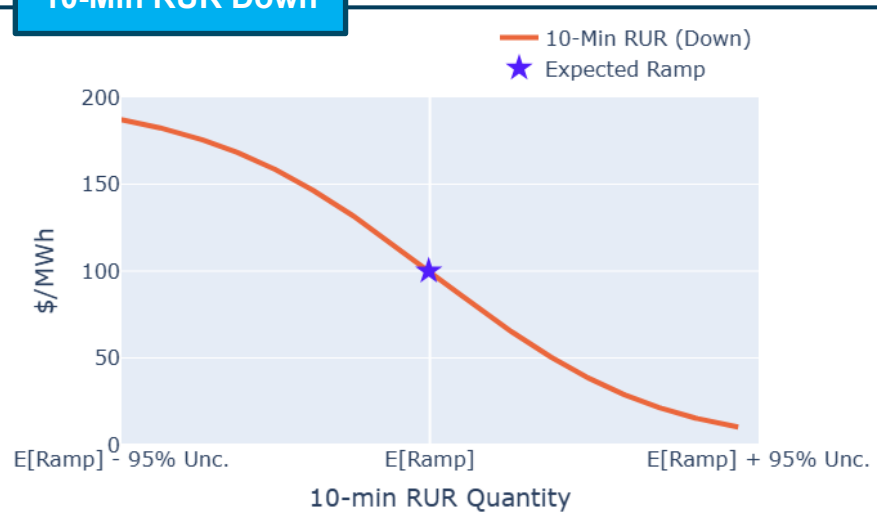
Ramp and Uncertainty Reserve ORDCs

Ramp and Uncertainty Reserve ORDCs would be anchored at the point of expected net-load ramp and shift based on that point. For example, at times of down ramping, RUR Up would only be procured based on the tail to the left of this point.

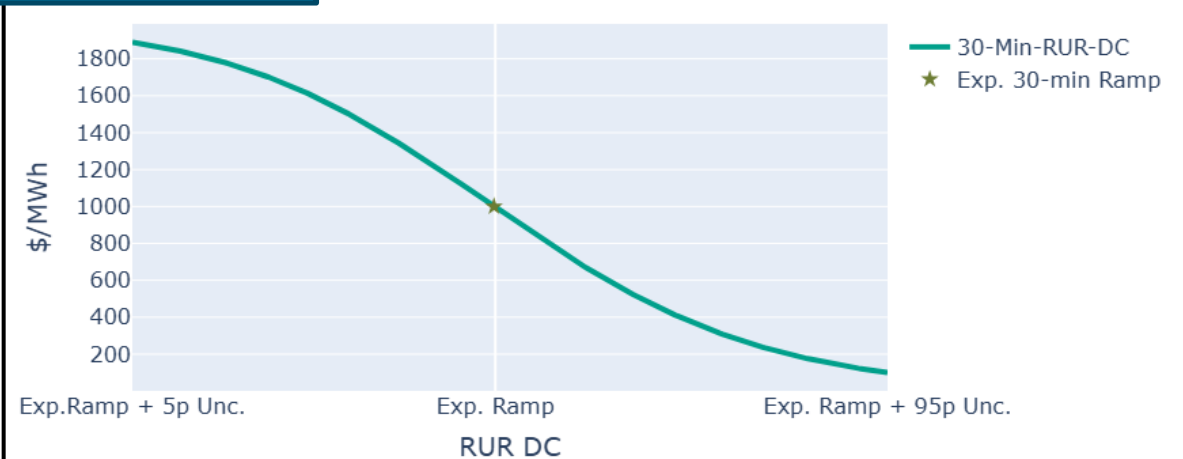
10-Min RUR Up



10-Min RUR Down



30-Min RUR



Updates to Contingency Reserves

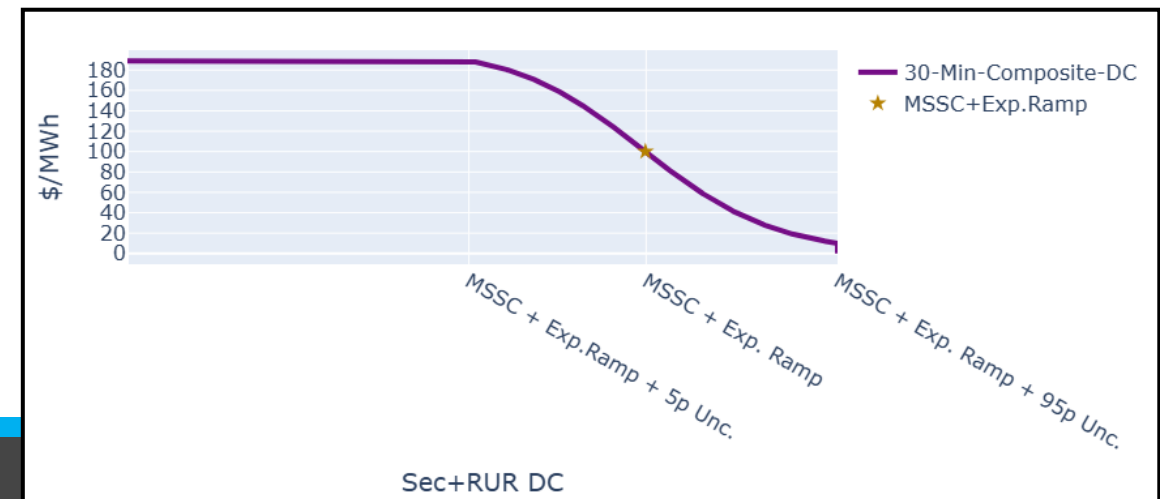
Performance	Deploy all reserves during Synchronized Reserve Events
Soft Offer Caps*	DAM: \$10/MWh + Penalty Risk RTM: \$10/MWh + Penalty Risk
ORDC	A single step at \$2,100/MWh
Resource Eligibility	Resources must be online and able to fully deploy within 10 minutes. Resources do not need to be dispatchable by SCED (e.g., resources in condensing mode and reserves only Demand Response can both provide Synchronized Reserves).
Requirement	The largest contingency x Synchronized Reserve performance factor* <i>Synchronized Reserve performance factor is based on observed reserve performance during Synchronized Reserve Events and is currently 1.2.</i>

**Cost-based offers above the soft offer cap may be submitted if justified with documentation*

30-Min Reserves (Secondary Reserves)

Performance	For offline Secondary Reserves: consistent with performance
Soft Offer Caps*	DAM: \$10/MWh RTM: \$10/MWh
Resource Eligibility	Resources must be able to come online and fully deploy within 30 minutes.
Requirement	30-Min RUR Requirement + the largest contingency <i>This requirement will be met by 30-Min RUR and 30-Min Secondary Reserves (nested design).</i>

*Cost-based offers above the soft offer cap may be submitted if justified with documentation



Day-Ahead Only Reserve Services

Performance	Maintain availability to provide energy and reserves consistent with day-ahead assignments. Come online when called by PJM in real-time.
Soft Offer Caps*	DAM: \$10/MWh. RTM: N/A *Cost-based offers above the soft offer cap may be submitted if justified with documentation
Resource Eligibility	Resources must be online or able to come online within 30 minutes and be able to fully respond (ramp) within 60.
ORDC	A single step at \$50/MWh
Requirement	Based on Risk Day, $DASR_T = \text{load forecast}_T * \text{load error} + \text{load forecast}_T * \text{gen performance} + \text{solar forecast}_T * \text{solar error} + \text{wind forecast}_T * \text{wind error}$ Hourly DASR values would be capped at the DASR values for the peak load hour. <i>This requirement will be met by 10-Min RUR, 30-Min RUR, 30-Min Secondary Reserves, 60-Min Spin Reserves and 60-Min Non-Spin Reserves (nested design).</i>

Risk Level	Percentile	Load	Gen. Perf.	Solar	Wind
Low	80 th Load / 50 th Others	2.19%	2.03%	11.28%	9.68%
Medium	85 th All	2.42%	3.49%	22.50%	24.19%
High	90 th All	2.79%	3.88%	25.51%	26.54%

* Uncertainty % based on three years of historical data

Performance

Maintain availability to provide energy and reserves consistent with day-ahead assignments. Follow PJM's energy dispatch instructions.

Soft Offer Caps

DAM: \$10/MWh. **RTM:** N/A

**Cost-based offers above the soft offer cap may be submitted if justified with documentation*

Resource Eligibility

Resources must be online and be able to fully respond (ramp) within 60.

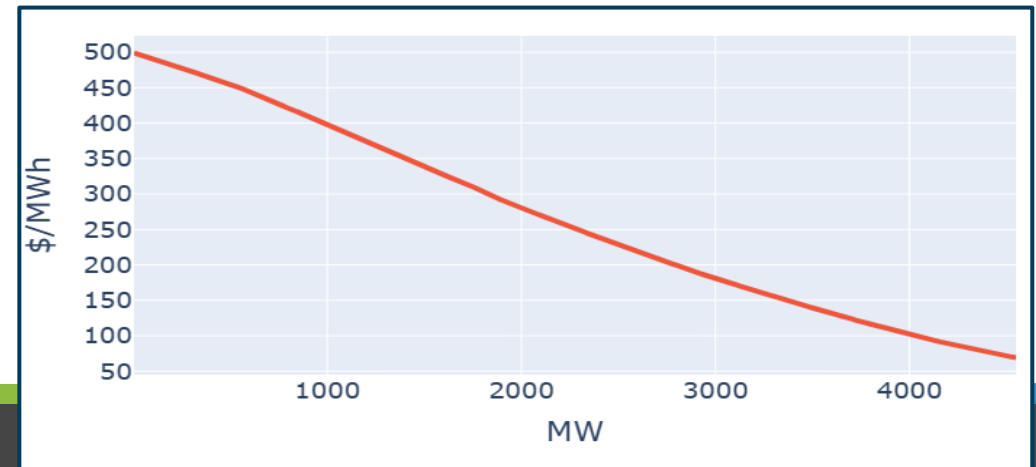
Requirement

Requirement is based on the 90th percentile shortfall in physical supply procured through the Day-Ahead Market relative to PJM's load forecast during winter days over the prior three years.

This requirement will be met by 10-Min RUR, 30-Min RUR and 60-Min Spin Reserves Reserves (nested design).

Energy Gap would only be procured on medium- and high-risk days* that fall within the "winter" season (November – March).

**Based on analysis of historical operational data, PJM estimates that this represents approximately 3-10 days a year, depending on winter risk factors.*



Synchronized Reserves

Nodal procurement where the reserve congestion constraint models a select number of interfaces that represent cascade risk

10-Min Ramp/Uncertainty Reserves

Nodal procurement where the reserve congestion constraint uses the same DFAX and the same transmission limits as for energy

30-Min Reserves

Nodal procurement where the reserve congestion constraint uses reserve-specific DFAX that reflect post-contingency flows for contingency scenarios of reliability concern

Day-Ahead Reserves

RTO procurement

Reserve Services included in PJM's Proposed Reforms

	Purpose	RTM / DAM	Response Time	Duration	Online Only	Locational
Synchronized Reserve	Contingency recovery	Both	10 min	30 min	☒	☒
10-Min RUR (Up and Down)	Real-time net-load ramp and uncertainty	Both	10 min	60 min	☒	☒
30-Min RUR	Real-time net-load ramp and uncertainty	Both	30 min	4 hr	☒	☒
30-Min Reserves	Replacement for contingency reserves	Both	30 min	4 hr	☐	☒
Day-Ahead Scheduling Reserves	Day-ahead uncertainty	DAM-only	60 min	--	☐	☐
Energy Gap Reserves	Scheduling physical supply to meet the PJM load forecast	DAM-only	60 minutes	--	☒	☐

- PJM has posted several documents and data sets to support understanding of its RCSTF proposal
- These documents are posted on the RCSTF page on [pjm.com](https://www.pjm.com) alongside the Issue Charge and Problem Statement:
<https://www.pjm.com/committees-and-groups/task-forces/rcstf>

Reserve Certainty Senior Task Force

The Reserve Certainty Senior Task Force (RCSTF) will investigate enhancements to PJM's reserve markets. Immediate-term topics to be explored include the quantity of reserves procured, how reserves are deployed, event performance and penalty structure, and alignment of offer structure with fuel procurement practices. Additionally, the group will explore long-term system needs due to an evolving generation fleet, including reserve product participation requirements and incentives for resource flexibility. The RCSTF reports to the Markets and Reliability Committee (MRC).

[View issues](#) the RCSTF is currently tracking.

Chair/Facilitator: [Lisa Morelli](#)

Secretary: [Amanda Egan](#)

During the meeting, if you are experiencing issues with connectivity or teleconference, please contact [Meeting Support](#). For registration issues, contact [PJM](#).

[Roster](#) [PDF](#) | [Updates](#)

	Date
PJM's RCSTF Package and Rationale PDF	4.7.2026
PJM's RCSTF Proposal Summary PDF	4.7.2026
Incentive Compatibility via Interactions between Reserve and Energy Prices PDF	4.7.2026
Reserve Service Nesting, Unnesting and Price Formation PDF	4.7.2026
2025 Reserve Requirements XLS	4.7.2026
RCSTF Product Explainer PDF	4.7.2026
Supplement Product Nesting and Resource Level Constraints PDF	4.7.2026
Visualizations of 2025 RCSTF Reserve Requirements PDF	4.7.2026
Operation Uncertainty Quantification PDF	3.12.2026
Real-Time Net-Load Uncertainty Quantification PDF	3.12.2026
Supplement Locational Constraints for Reserve Services PDF	3.13.2026
Day-Ahead Uncertainty and Risk Framework WEB	10.29.2025
Issue Charge PDF	10.3.2023
Problem Statement PDF	9.25.2023

- [RCSTF Matrix](#)
- [PJM's RCSTF Package and Rationale](#)
- [Operation Uncertainty Quantification](#)
- [Real-Time Net-Load Uncertainty Quantification](#)
- [Locational Constraints for Reserve Services](#)
- [Product Nesting and Resource-Level Constraints](#)
- [Reserve Service Explainer Table](#)
- [2025 Day-Ahead and Real-Time Reserve Requirements](#)
- [Graphical Visualizations of the 2025 Requirement Values](#)
- [Reserve Service Nesting, Unnesting and Price Formation Examples](#)
- [Incentive Compatibility via Interactions between Reserve and Energy Prices](#)

Facilitator:

Lisa Morelli, Lisa.Morelli@pjm.com

Secretary:

Amanda Egan, Amanda.Egan@pjm.com

SME/Presenter:

Emily Barrett, Emily.Barrett@pjm.com

RCSTF Proposal Summary

A green speech bubble containing a white question mark, positioned above a blue speech bubble with three horizontal lines, indicating a question or a point for clarification.

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Member Hotline

(610) 666 – 8980

(866) 400 – 8980

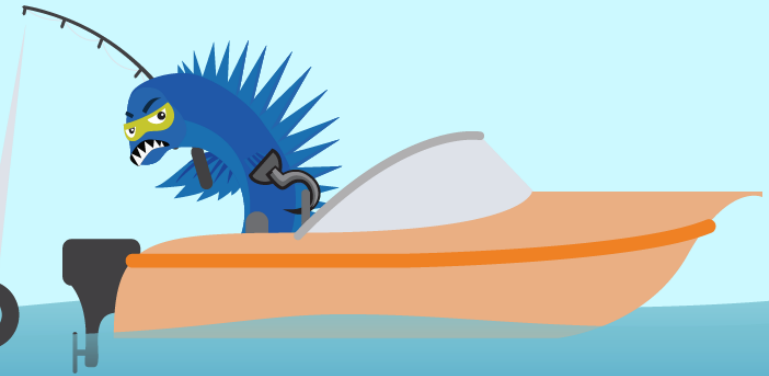
custsvc@pjm.com

Acronym	Term & Definition
SR	Synchronized Reserves are reserves provided by resources that are synchronized to the grid and can respond within 10 minutes.
ORDC	An Operating Reserve Demand Curve is an administrative pricing curve that represents the markets willingness to pay for reserves at different reserve levels.
RUR	Ramping/Uncertainty Reserves are reserves that would be procured to manage forecasted ramp and uncertainty operational flexibility needs.

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POWER GRID**
**THINK BEFORE
YOU CLICK!**



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MALICIOUS PHISHING
EMAILS**



Report suspicious email activity to PJM.
Call (610) 666-2244 or email it_ops_ctr_shift@pjm.com