

# RCSTF Initial Solution Packages Overview

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## Comprehensive Topics on Reserve and Energy Market

- [Issue Charge](#) and [Problem Statement](#) approved at September MRC.
- Addresses immediate-need issues and longer-term issues

### 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

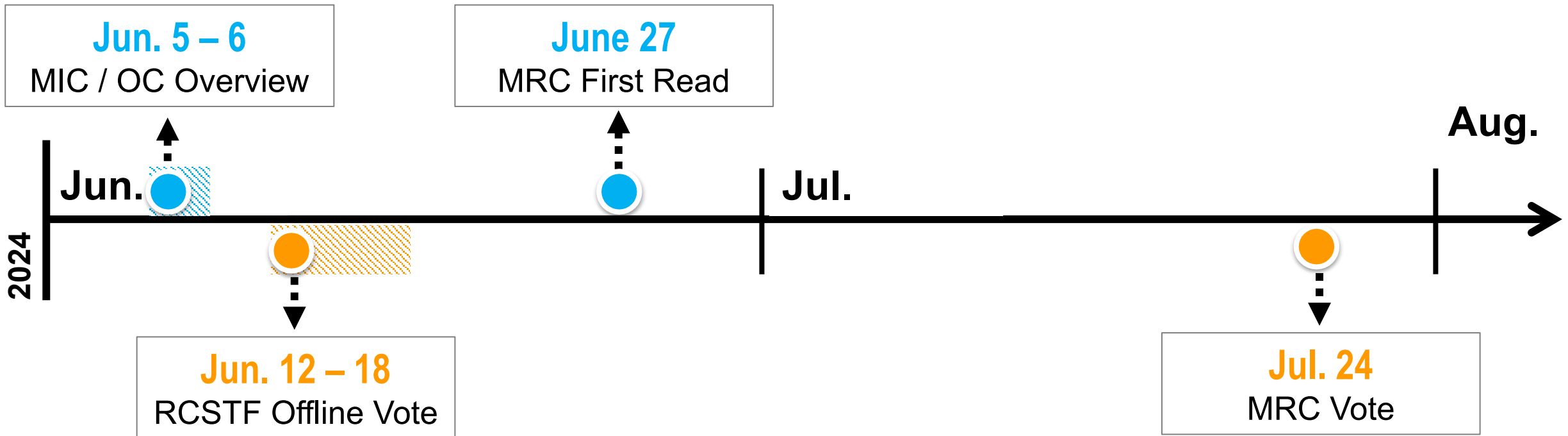
Addresses future system needs for reserve and flexibility, with evaluation of the Operating Reserve Demand Curve (ORDC), operational metrics, and enhancements or additional market solutions (ramping, multi-interval, etc.)

The RCSTF has worked on solutions addressing the immediate-need scope over the past 8 months. Additional time would be needed to reach consensus on a broad package of reforms, many of which could not be implemented before Winter 2024/2025.

## Path Forward

<b>Now:</b>	Vote on two targeted reforms that provide incremental improvement to the status quo, and which may be implemented before next winter: <ol style="list-style-type: none"><li>1. Adjustments to the reserve requirements</li><li>2. Changes to synchronized reserve deployment</li></ol>
<b>Up Next:</b>	Address the alignment of the reserve offer structure and compensation with resource fuel procurement
<b>Further Ahead:</b>	Begin discussions on the scope addressing the longer-term needs towards the end of this year

The RCSTF will be asked to take two separate, independent votes: one on the reserve requirements proposal and one on the reserve deployment proposal.



*There are no tariff changes needed for these proposals. An MC vote is not necessary.*

● First Read / Info    ● Vote



# Solution Package 1: Reserve Requirement Definitions

**Challenge:** The 30-minute reserve requirement does not currently reflect the operational risks that PJM dispatcher must account for on a day-to-day basis.

Change the 3,000 MW quantity the 30-minute Reliability Requirement to better capture day-to-day risks in alignment with current operational practice, using the methodology previously used under the Day-Ahead Scheduling Reserve:

**30-Min Requirement = MAX(Load Forecast Peak\*(Avg. Load Forecast Error + Avg. Forced Outage Rate), Primary Reserve Requirement, Active Gas Contingency)**

**Challenge:** Extending one of the extended reserve requirements to address operational uncertainty would cascade into all three, and could force the over-procurement of unneeded reserves.

For example, if PJM needed to procure additional 30-minute reserves to address operational uncertainty, that would require also procuring the same amount of additional SR and PR.

Clarify that Synchronized Reserve, Primary Reserve and 30-Minute Reserve extended reserve requirements (i.e., Step 2B of each ORDC) can be increased independently. Product substitution and nesting rules would still apply as they do in status quo.

- Clarified that each of the reserve services has its own Extended Reserve Requirement
- Clarified that each reserve service's Extended Reserve Requirement can be increased discretely
- Replaced the 3,000 MW value in the 30-Minute Reliability Requirement with the new minimum operating reserve quantity, and referenced Manual 13 where that calculation is detailed





# Solution Package 2: Synchronized Reserve Deployment

- Communication delays caused by the All-Call
- Inconsistency between how instructions are given during a spin event and during normal dispatch
- Confusion on what PJM is requesting from resources during a spin event
- Dispatchers lack tools to deploy less than 100% of the reserves held

- Dispatcher initiates the reserve event, entering the amount of reserves to be deployed
- **Reserve deployment instructions to generators will be transmitted as an update to basepoints.** Deployed reserve MWs are added to the current output of each resource and sent out immediately through telemetry
  - The automated notification that we are in a spin event, and the All-Call notification will still be issued.
- For demand response resources, deployment instructions continue to go through DR Hub
- While the event persists, dispatch instructions to dispatch-following resources with a reserve deployment assignment would be the greater of a) the original deployment instruction sent at the start of the event or b) the new economic dispatch point calculated by SCED



# Less than 100% Reserve Deployment Proposed Solution

- To the extent possible, all resources will be deployed pro rata
  - Example: A resource has a 10 MW SR assignment and PJM deploys 80% of held reserves. The resource would be instructed to deploy 8 MW.
- Inflexible generation resources will be deployed to the greater of a) EcoMin and b) the pro rata reserve deployment instruction\*
  - Example: A condenser has an EcoMin of 10 MW, a 30 MW SR assignment, and PJM deploys 50% of held reserves. The resource would be instructed to deploy 15 MW.
  - Example: A condenser has an EcoMin of 20 MW, a 30 MW SR assignment, and PJM deploys 50% of held reserves. The resource would be instructed to deploy 20 MW.
- Resources without a dispatchable range will be deployed to their SR assignment\*

*\*Due to these constraints, actual reserves deployed may be greater than the pro rata calculation*

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<ul style="list-style-type: none"> <li>The RCSTF will be conducting an offline vote on two solution packages following the June 12 meeting.</li> </ul>	<ul style="list-style-type: none"> <li>The reserve requirements proposal seeks to amend the 30-minute reserve requirement and provide additional flexibility when extending the 2<sup>nd</sup> step on the reserve demand curves.</li> </ul> <p>The goal is to better reflect operational needs in the market clearing.</p>	<ul style="list-style-type: none"> <li>The reserve deployment proposal seeks to add reserve deployment instructions to resource basepoints in order to reduce communication issues.</li> </ul> <p>The existing All Call and ICCP event notifications are not changing.</p>



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## **RCSTF Initial Solution Packages**

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# Appendix: Additional Manual Revisions

- Detailed how the minimum operating reserve value would be calculated, based on the load forecast peak, average load forecast error and average generator forced outage rate
- Detailed how each quantity in the operating reserve calculation is derived
- Explained the process for calculating the average load forecast error and average generator forced outage rate annually
- Clarified how the 30-Minute Reliability Requirement is set



- Updated PJM Actions to specify that the reserve deployment quantities will be added to resource basepoints and sent out immediately during a SR Event
- Added information about demand response SR deployment through DRHub
- Updated PJM Member Actions to specify that resources shall continue to follow their basepoints, which will reflect the SR deployment instructions
- Specified that if resources holding a SR assignment either a) do not receive a basepoint or b) cannot deploy less than 100% of their assignment in the case of a partial deployment event, these resources should immediately deploy their full SR assignment

Acronym	Term & Definition
LMP	<p><b>Locational Marginal Price</b> is defined as the marginal price for energy at the location where the energy is delivered or received. For accounting purposes, LMP is expressed in dollars per megawatt-hour (\$/MWh). LMP is a pricing approach that addresses Transmission System congestion and loss costs, as well as energy costs.</p>
SCED	<p><b>Security Constrained Economic Dispatch</b> is the optimization engine used to calculate dispatch and reserve assignments and to set prices.</p>
MW	<p>A <b>Megawatt</b> is a unit of power equaling one million watts (1 MW = 1,000,000 watts) or one thousand kilowatts (1 MW = 1,000 KW). To put it in perspective, under non-severe weather conditions, one MW could power roughly 800 to 1,000 average-sized American homes.</p>

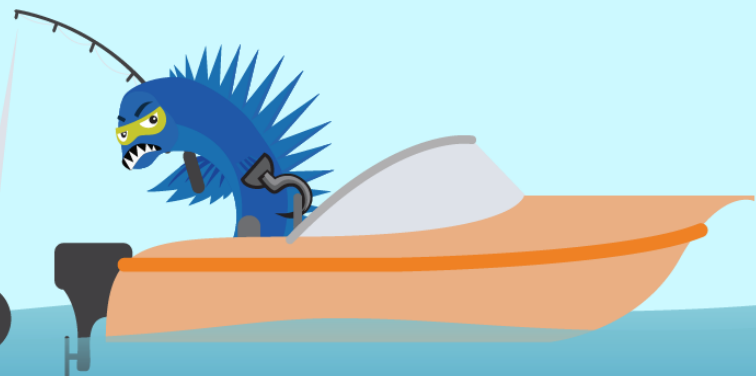
Acronym	Term & Definition
SR	<p><b>Synchronized Reserves</b> is a reserve capability that can be converted fully into energy within 10 minutes following the request of PJM. Equipment providing Synchronized Reserve must be electrically synchronized to the power system.</p>
PR	<p><b>Primary Reserves</b> is a reserve capability that can be converted fully into energy within 10 minutes following the request of PJM. The Primary Reserve service can be provided by both Synchronized and Non-Synchronized Reserves.</p>
ORDC	<p><b>Operating Reserve Demand Curve</b> is used to articulate the value of maintaining reserves at specified levels</p>

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POWER GRID**

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YOU CLICK!**



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EMAILS**



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