

PJM Comments Following the April 9, 2025

Reserve Certainty Senior Task Force Meeting

Given the complexity of this topic, PJM is posting this document to clarify its position and proposal on specific sections of the Reserve Certainty Senior Task Force (RCSTF) scope and provide factual corrections to statements made during presentations by the IMM at the April 9, 2025, RCSTF meeting.

Agenda Item 2: IMM Energy Gap and Load Bidding

PJM recognizes that directly comparing the bid-in demand to the PJM load forecast is not an appropriate comparison. The data presented about the cold weather event over MLK weekend was not intended to represent how PJM would develop reserve requirements in its market clearing to address the energy gap. It was instead a part of a much larger conversation presenting information about that specific event.

PJM's goal in considering market solutions to address the energy gap is to ensure that **PJM enters the Operating Day with enough physical supply with either a reserve or energy commitment to meet the load forecast plus expected real-time reserve needs to enable reliable operations**. There are multiple factors that could cause the Day-Ahead Market to clear less physical supply than would be needed to meet the load forecast, including virtual participation and the use of bidding strategies.

The difference between the physical supply cleared through the Day-Ahead Market and the forecasted load is something that PJM already considers in Operations. Today, PJM uses its Reliability Assessment and Commitment (RAC) tool to commit resources outside of the Day-Ahead Market. Changes are required to the current approach based on an increased reliance on fuel insecure resources and gas market dependencies. In the future, PJM would like to reflect that reliability need in its Day-Ahead Market to ensure that resources have a day-ahead energy or reserve position and sufficient advance notice to make any arrangements necessary to be ready going into the Operating Day. PJM believes this will support reliable operations and promote market efficiency. A proposal has not been developed or presented by PJM on how the requirements for this reserve product would be defined or how it would be cleared. PJM presented some initial thinking and options on these topics to spur discussion within the RCSTF as the group works toward solution development.

Agenda Item 3: IMM RCSTF Phase II

1. Slide 2: The IMM asserts that the Secondary Reserve product does not have a defined purpose, and PJM has ample 30-minute Reserves available to be called, including demand response and recallable exports.

Secondary Reserves are Operating Reserves, comprising online and offline reserves that respond in between 10 to 30 minutes. Secondary Reserves help maintain/reestablish Primary Reserves upon their deployment but, like with all other reserve products, can be used for a variety of causes that result in a shortage of supply that needs to be addressed within the defined time frame. The concept of Operating Reserves was developed by the North American Power Systems Interconnection Committee (NAPSIC), the



predecessor of NERC, in the 1960s.¹ PJM adopted the Operating Reserves concept in the 1960s, which is composed of Primary (0- to 10-minute) and Secondary (10- to 30-minute) reserves. The defined purpose of secondary reserves is not unique to PJM.²

The PJM Market has a requirement of 3,000 MW of reserves, at all times, and that quantity is inclusive of the Synchronized and Primary reserves procured for the system. This requirement differs from what is used in system operations.³

The IMM states that ample 30-minute Reserves are available to be called upon if needed. In most cases, this statement is true; however, unoffered demand response and recallable exports are not currently considered to be supply for this service. Further, the offer rules in place today do not allow resources, which are required to offer this capability, to reflect any costs the resource may incur to provide 30-minute Reserves. For example, the cost of arranging fuel or other costs currently cannot be expressed in offers because they are required to be \$0/MWh. Nonetheless, resources are still required to offer into this market.

2. Slide 4: The IMM asserts that the role of reserves is to allow the market to economically allocate available supply between energy and reserves and should not reflect operator action.

PJM agrees the market construct for reserves is in place to economically allocate available supply between energy and reserves. This goal can only be met if the reserve requirements reflect what is necessary to address risk and maintain reliability. Failure to do this allocates resources in a manner that is inconsistent with the reliability needs of the system, is not cost minimizing, results in prices that are not consistent with the operation of the system, and forces system operators to take out-of-market actions to close the gap between the market outcomes and reality. All of these go against the goals of the market, which is to procure reserves at least cost to consumers and provide transparent clearing prices that reflect the cost of maintaining them.

As has been presented in the RCSTF, other ISO/RTOs have regimes that align market requirements with operational needs. PJM believes the market must do this to be effective, otherwise there is an increased risk to reliability.

3. Slide 5: IMM states Synchronized and Primary reserve requirements should be tied to the largest contingency, according to PJM practice prior to 2023 and NERC rules.

Although the PJM Market requirements are set based on the largest contingency, NERC rules do not **require** PJM to tie its reserve requirements to the largest contingency. NERC BAL-002 sets **minimum** reserve requirements that Balancing Authorities need to carry but does not require carrying that amount.

¹ See page 155; <u>https://www.nerc.com/news/Documents/NERCHistoryBook.pdf</u>

² See slide seven;

https://www.nyiso.com/documents/20142/4615689/2%201242019%20MIWG%20Reserve%20Background.pdf/b9642377-556ace87-39f1-e2773a4d9d7e

³ <u>https://www.pjm.com/-/media/DotCom/committees-groups/task-forces/rcstf/2024/20240717/20240717-item-03---pjm-reserve-requirements.pdf</u>



The objective of the standards is not to set a specific requirement for reserves but rather a requirement for recovering Area Control Error. NERC BAL-002 does this by placing performance obligation on the Balancing Authority (PJM) to recover from a contingency event in a set time period. PJM sets the Synchronized and Primary reserve requirements to meet both obligations: (1) meeting the minimum standard NERC sets regarding the megawatt requirement and (2) ensuring it can recover from ACE excursions within the required time frame.

- OATT Attachment K Appendix, Section 1.7.19A(b), Page 4,210 "The Office of the Interconnection shall obtain and maintain for each Reserve Zone and Reserve Sub-zone an amount of Primary and Synchronized Reserve equal to the respective Primary Reserve Requirement and Synchronized Reserve Requirement objectives for such Reserve Zone and Reserve Sub-zone, as specified in the PJM Manuals."
- PJM M13, Section 2.2 "Reserve Requirements," Page 19: "PJM schedules sufficient Contingency Reserves to satisfy the Reliability First (RF) Regional Criteria."

Other ISOs also adjust for unit performance. SPP uses a performance adjustment to carry additional reserves when their reserve performance is poor. Performance adjustments enable PJM to rely on Synchronized Reserves for contingency recovery. PJM will operate in a manner that respects all NERC standards. The objective of the market is to provide a means to do so while minimizing cost to consumers and providing transparent clearing prices.

4. Slides 9–11: IMM states that PJM's 30% increase in the reserve requirement should be removed immediately.

PJM Synchronized Reserve performance has declined since Reserve Price Formation was implemented in October 2022 necessitating the 30% adder. PJM has communicated an approach to eventually phase out the Synchronized Reserve requirement based on observed improvements in resource performance.⁴ Synchronized Reserves must perform in order to maintain system reliability.

5. Slide 15: IMM states that the primary source of uncertainty is net load forecast error, and intermittent output in PJM remains a relatively small share of total energy.

Although a large amount of uncertainty PJM faces is net load forecast error, it is not the only uncertainty that needs to be evaluated and managed. The uncertainty PJM operators face is a result of load forecast error, wind and solar forecast error, <u>unit performance, weather, behind-the-meter generation, and</u> <u>interchange.</u>

PJM's intermittent penetration grows daily, setting new peaks. PJM is on track to almost double its solar production since last summer. As of December 2024, PJM has an additional 54,474 MW of solar in the planning queue process. As a result, it is important to get ahead of these challenging operational conditions.

⁴ <u>20250306-item-08a---synchronized-reserve-performance-update.pdf;</u> 20250306-item-08b---synchronized-reserve-adder.pdf



PJM presented the challenges and the need to quantify operational uncertainty in previous Reserve Certainty Senior Task Force meetings.⁵

In addition, PJM has collaborated with its peer ISOs/RTOs with deep penetration of renewables, and their uncertainty programs all reflect more than load forecast error; rather, they account for load forecast, weather, renewable generation error, generator performance and interchange.⁶

Finally, the IMM asserts that "Intermittent output is increasing in PJM but remains a relatively small share of total energy" but does not recognize that with nearly 16,000 MW of grid-connected solar anticipated for summer 2025, PJM will encounter challenges with operating intermittent resources that move quickly and can pose ramping challenges intra-day that current reserve products are challenged to address. This challenge is a current-day challenge, which will only increase in the future.

6. Slide 20: The IMM states that Primary Reserve covers forced outage risk, and uncertainty reserves should not include forced outage risk.

As a starting point, Primary Reserves are 10-minute reserves used to recover ACE, typically from a unit contingency but not exclusively, and have a duration of 30 minutes. The largest single contingency loss plus a 50% margin is covered by Primary Reserves. When these reserves are deployed for ACE recovery, they have a 30-minute duration after which they must be replaced with longer-duration energy providing resources that must be prepared to be online within 30 minutes at most. Primary Reserves do not cover the need for longer-duration energy resources. Those megawatts must be made available to PJM somewhere in order to replenish its Primary Reserves as soon as possible.

7. Slide 22: IMM asserts that PJM is proposing in the long-term RCSTF reserve effort to use the DASR requirement to establish reserve needs.

This is an incorrect characterization of PJM's thinking on the needed reforms. This was a past proposal for the short-term effort that was voted on in July 2024. At that time, PJM proposed updating the DASR requirement to match operational needs as a near-term improvement upon the status quo, which set the requirement at 3,000 MW, which does not adequately address system operations risk. Our current proposal is to quantify our uncertainty and represent those needs in the reserve requirement.⁷

8. Slide 23: IMM claims that PJM's identification of an energy gap is based on an incorrect analysis, which was comparing the "DA PJM forecast to DA Bid in Load."

20250212-item-04---pim-perspective-on-approaches-to-address-uncertainty.pdf

⁵ 20250212-item-02---uncertainty-in-operations-rcstf.pdf

⁶ https://www.pjm.com/-/media/DotCom/committees-groups/task-forces/rcstf/2025/20250212/20250212-item-02---uncertainty-inoperations-rcstf.pdf

⁷ <u>20250212-item-02---uncertainty-in-operations-rcstf.pdf</u>; <u>20250212-item-04---pjm-perspective-on-approaches-to-address-uncertainty.pdf</u>



The IMM then further states PJM's energy gap proposal aims to match day-ahead physical generation plus reserves to real-time physical generation plus reserves.

PJM is not proposing to compare "DA PJM forecast to DA Bid in Load" when determining the energy gap. PJM is proposing to look at an option to allow the total DA energy and reserve commitments cleared on physical resources to meet the real-time load forecast plus expected real-time reserve requirements as they are best known at the time of the DA market. PJM has not proposed a detailed approach to do this at this time.⁸

9. Slide 24: IMM indicates PJM's proposal is to use an ISO-NE-like option product to address the energy gap.

This is not a PJM proposal. The ISO-NE-like solution was presented as one of two options in January 2025 for discussion purposes and to share all the potential options PJM has considered in our work to address the energy gap challenge. It was not presented as a PJM proposed solution, and PJM identified some of the same questions and potential challenges in that presentation as the IMM has highlighted.

10. Slides 26–27: IMM suggests all ramping needs of the system can be solved with IT SCED and multi-interval dispatch.

PJM agrees that the implementation of a robust multi-interval dispatch, pricing and settlement process is an option that could be advantageous in addressing forecastable ramping needs. Further, PJM has been working on exploring advancements like this with partners in academia for some time. However, as discussed in "PJM's Perspective on the Challenges and Potential Solutions for Long-Term Reserve Certainty Reforms" starting on page 24,⁹ PJM does not view this to be a solution that can be implemented in time to address the current and near-future problems facing system operators, nor does it address issues related to the need for additional reserves due to growing system uncertainty.

Additionally, without a multi-interval settlement approach, which would introduce significant complexity, PJM has concerns that multi-interval dispatch could increase uplift and/or create disincentives to follow PJM dispatch, as Dr. Mort Webster of Pennsylvania State University (PSU) highlighted in his presentation to the RCSTF in October 2024.¹⁰ While PJM does believe that reforms to IT SCED should be evaluated and that they could support the broader market reforms, PJM does not currently have a clear understanding of how it could effectively be used as a look-ahead dispatch engine.

⁸ <u>20250115-item-03---pjms-perspective-on-solutions-to-address-the-day-ahead-energy-gap.pdf;</u> <u>20250312-item-03---rcstf-work-and-mlk-challenges.pdf</u>

⁹ 20241211-item-02---reserve-certainty-long-term-scope-priorities.pdf

¹⁰ <u>20241016-item-03---flexible-ramping-products-tutorial.pdf</u>