

RCSTF Work to Support Operations A review of MLK Weekend Challenges

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RCSTF March 12, 2025





BACKGROUND:

Reserve Certainty Senior Task Force

The long-term scope of the Reserve Certainty Senior Task Force (RCSTF) is intended to align market products and outcomes with system operation needs on a daily basis both under normal and conservative operations.

The events of the January 2025 cold weather underscored the need for reform.

Extreme Uplift	Price Formation	Gas/Electric Coordination
Over \$300M in uplift emphasizes the need to better capture operational needs in pricing and jeopardizes the market's ability to send actionable price signals.	PJM and FERC price formation principles highlight the need for reserve and energy prices to reflect system conditions and appropriately value scarcity.	The RCSTF and Gas Electric Subcommittee will need to work together to address discontinuities in the gas and electricity markets specifically during weekends and holidays.



FERC has highlighted concerns when markets do not appropriately align with reliability and operational needs.

Use of uplift payments

"Use of uplift payments can undermine the market's ability to send actionable price signals."

Over \$300M of uplift due to out of market commitments for reliability.

Scarcity and shortage pricing

"To the extent that actions taken to avoid reserve deficiencies are not priced appropriately or not priced in a manner consistent with the prices set during a reserve deficiency, the price signals sent when the system is tight will not incent appropriate short- and long-term actions by resources and load."

ORDC to procure 30-minute operating reserves is a flat 3000MW, regardless of operational conditions or risks.

"These protocols require that the RTO/ISO's measure of marginal cost be accurate and allow a resource to fully reflect its marginal cost in its bid. To the extent existing rules on marginal cost bidding do not provide for this, bids and resulting energy and ancillary service prices may be artificially low."

Reserve offers today are \$0. Reserve clearing prices did not reflect the value of reserves during the January cold

Operator actions that affect prices

"To the extent RTOs/ISOs regularly commit excess resources [out-of-market], such actions may artificially suppress energy and ancillary service prices or otherwise interfere with price formation."

Operations committed many units for reliability out of market, since there was no market mechanism to commit them.

Energy Price Formation | Federal Energy Regulatory Commission (ferc.gov)



Long Term Reserve Changes: Areas of Focus

PJM's market design must align with operational and reliability needs.

Accurately quantifying and valuing essential reliability services is critical.

3 Avoidable costs for providing reserve services should be recoverable through reserve markets.

Address the energy gap day-ahead for a reliable operating plan Reform current operating reserves and/or develop new reserve products to address the operational risk uncertainty needs

Properly value, price, and incentivize the reserve needs of the system

Day-Ahead Reserves



PJM's Day-Ahead Energy Market clears enough supply to meet bidin demand, which may be lower than the PJM load forecast for the next day.

During MLK Weekend and the cold weather in February, we saw load under bidding in the Day-Ahead Market in comparison to PJM's forecast.

PJM's Day-Ahead Energy Market does not have mechanisms and/or requirements in place to procure sufficient reserves to manage operational risk. This is inclusive of:

- 1. the energy gap in the Day-Ahead Energy Market
- 2. the day-ahead scheduling reserves needed for operations
- 3. additional reserves operations may need for conservative operations and risk/uncertainty.





Day-Ahead Energy Gap

- The Day-Ahead Energy Gap where the DA market does not commit enough physical generation to meet PJM's load forecast exists on a day-to-day basis.
- During the cold weather over MLK weekend and in February, the DA energy gap was observed to be larger than the day-to-day gap, and largest during





Day-Ahead Scheduling Reserves

Short- Term RCSTF Proposal: Better align the 30-minute reserve requirement to more accurately reflect the operational risks that dispatch must account for *on a day-to-day basis* (inclusive of conservative operations)

Revise the 30minute Reserve Requirement to be the greater of:

- Load Forecast Peak*(Avg. Load Forecast Error + Avg. Forced Outage Rate) = Load Forecast Peak* 4.51% for 2025
- Primary Reserve Requirement,
- Largest Gas Contingency



30-Minute Reserve Requirement

Day	Peak MW	30min Reserve Reliability Requirement	Proposed (Operations) 30 min Reliability Reserve Requirement	(Min) Cleared 30 min Reserves
1/18/2025	104,510	3,000	4,713	15,612
1/19/2025	119,608	3,000	5,394	13,410
1/20/2025	139,650	3,000	6,298	8,761
1/21/2025	144,024	3,000	6,495	7,951
1/22/2025	145,037	3,000	6,541	8,007
1/23/2025	138,923	3,000	6,265	9,712

The 30 Minute Reserve Requirement Cleared at \$0 for all intervals during this time period



30-Minute Reserve Requirement

Day	Peak MW	30min Reserve Reliability Requirement	Proposed (Operations) 30 min Reserve Reliability Requirement	(Min) Cleared 30 min Reserves
2/16/2025	99,950	3,000	4,508	14,027
2/17/2025	119,543	3,000	5,391	14,146
2/18/2025	127,875	3,000	5,767	12,921
2/19/2025	131,264	3,000	5,920	11,173

The 30 Minute Reserve Requirement Cleared at \$0 for all intervals during this time period



Uncertainty Reserve Needs

 Enhance quantification of uncertainty/risk through a risk-based approach and reflected in Markets to address this uncertainty/risk

TODAY:

- · Process to assess uncertainty is not streamlined
- · Handling uncertainty on a case by case basis
- Fixed (seasonal) market products and not dynamic risk-based products

TOMORROW:

- Streamlined uncertainty evaluation
- Markets products that support uncertainty in operations
- Uncertainty on the system comes from Intermittent Resources (Solar, Wind), Generator Performance, Load, Weather, BTM Solar
 - The RCSTF will focus on developing market constructs for key uncertainty risk factors



Reliability needs dictate that PJM manage uncertainties that are not reflected in its markets.

Current ORDC does not have a mechanism to reflect these in market

An updated Market Design should allow these uncertainties in market clearing





Cold Weather Operating Risk

PJM's Short-Term proposal in the RCSTF was to de-couple extending the ORDC (Step 2B) to allow operations to reflect some of the additional risk in the 30-minute reserve requirement.



- Reflecting some risk would have benefited DA to better align Markets and Operations
- All the identified MWs at risk would not have been reflected in Markets, for a few reasons
 - All the identified MWs are not needed in 30 minutes
 - Carrying large MW values under the current market design can create uplift and price suppression.



Cold Weather Operating Risk

PJM's Longer-Term view is to reflect the operational risk in the market with the support of a number of reforms

- Reviewing the requirements for reserves using a probabilistic, riskbased approach and how operations needs these resources committed (online, offline)
- Looking at product definitions including a longer duration product (2hrs, 4hrs)
- Reviewing ORDCs and Price Formation



PJM's existing reserve construct does not have a mechanism for resources to reflect avoidable costs (e.g. fuel procurement) into the market

- 30-Minute Reserves were \$0 throughout MLK weekend
- We know generators were taking action, with associated costs, to secure gas to be available reserves for PJM

This is not a new observation, and was also a recommendation from FERC and NERC in the WSE Report Recommendations

Reflecting Cost of Actions to Provide Reserves

Avoidable costs associated with providing reserve services should be recoverable through PJM's Energy & Ancillary Service markets

Simplest Example: A resource buying gas from the spot market would make an offer for reserves on expectations of purchasing gas and be available to run if they received a reserve commitment. Costs can capture activities such as: fuel procurement costs, expected cost related to disposition of unburned gas, balancing charges, etc.

- What's missing?
- Other considerations for resource parameters (example pipeline restrictions/OFO/ratable takes)



Additional Enhancements for Reserves

Additional areas we have discussed in RCSTF will also provide benefits to the challenges of MLK weekend.

• Locational reserves and modeling the constraints to ensure deliverability

 Looking at requirements to provide reserves and unit parameter to ensure RT availability of the reserves



Additional Challenges & Discussion

Conversations in the RCSTF to-date will not fully address the gas/electric day timing and the multi-day gas packages for weekends and holiday weekends

- Further discussion in the RCSTF for these challenges
- PS/IC at MIC for long lead commitments and offer capping
- Electric-Gas Coordination Subcommittee Work

Electric-Gas Coordination Subcommittee

Discussion overlap will occur between the RCSTF and the EGCS however the intent is that the new EGCS will focus on more general discussions with stakeholders on cross industry topics impacting gas electric coordination including updates on efforts and actions going on at FERC, NERC, NAESB et al and that the subcommittee is not intending to directly address the RCSTF work.

First EGCS meeting scheduled for 3/27/25 from 1pm to 4pm





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