IMM RCSTF Perspective

Reserve Certainty
Senior Task Force

June 9, 2026

IMM

Monitoring Analytics

IMM RCSTF Proposal

- The IMM proposal addresses immediate RCSTF goals:
  - Reserve performance
  - Reserves to address net load forecast uncertainty
  - Reserves to address BAL-002-03 R3 (Contingency Reserve Restoration)
- Additional reserve changes in the PJM proposal are market design preferences, not operational needs.
- Additional reserve changes have alternatives that PJM is not willing to study.
- Additional reserve changes significantly delay addressing immediate needs.

Alignment with Goals of RCSTF

- **Other goals from PJM's RCSTF problem statement are vague and undefined**
  - **Pricing operator actions and valuing reserves**
  - **Compensating for unit availability**

- **None of the RCSTF goals require unmitigated market power, basing DA reserves on load bidding behavior, online secondary reserves, or eliminating NSR.**

Implementation

- **Implementation time frames matter**
  - **The IMM proposal can be implemented in the near term.**
  - **Additional reserve changes significantly delay addressing immediate needs.**
  - **The PJM proposal competes with other implementation priorities that also address future market needs, like the multiconfiguration model / ESR model.**

Implementation

- **IMM recommends separate votes on these issues:**
  - **A vote on whether to separate immediate changes from longer term changes.**
  - **A vote on immediate change packages.**
  - **A vote on complete packages.**

System Implementation

- **Correctly modeling reserves and modeling the flexibility in the market requires a more sophisticated model than PJM currently uses.**
- **The multiconfiguration and storage models that are part of the nGEM project are complementary to the RCSTF.**
- **RCSTF implementation should not be allowed to slow the work on nGEM priorities.**
- **PJM and stakeholders should develop and implement rules for CC/CT/ST operating transitions and storage before implementation of new reserves design.**

RCSTF Recommendation

- In addition to RCSTF proposal vote, the IMM recommends that the RCSTF vote on interim steps that address the near term needs.
- Interim steps can be grouped by need and implementation type.

- Incorporating net load forecast uncertainty in reserves should be addressed as soon as possible.
- Improvements to reserve performance accountability should continue to move forward.

RCSTF Recommendation

- **The IMM proposal can be broken down by implementation time and process:**
  1. **Changes to market inputs**
     - Incorporate net load forecast uncertainty in reserves
  2. **Changes to PJM internal systems and processes**
     - Reserve performance evaluation and settlements changes
  3. **Changes to market clearing engines**
     - Reserve eligibility, inclusion of DR, reserve subzone use, performance adjustment to resource clearing, and all other changes.
- **The implementation could proceed in this order.**

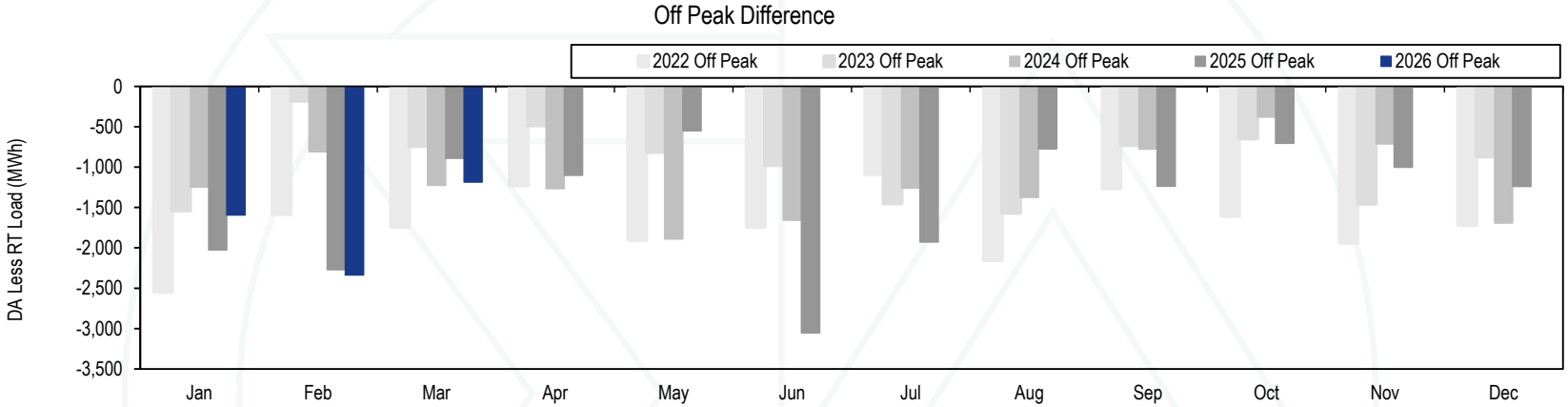
IMM Objections to PJM's Proposal

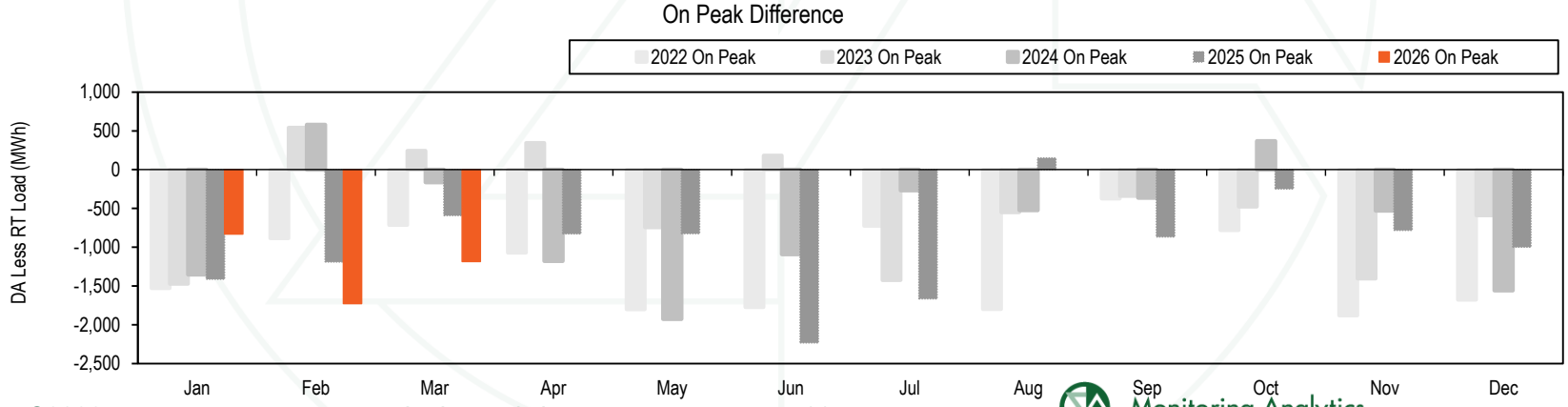
- **IMM has five key objections to the PJM proposal.**
  1. **Reserves for PJM Load Forecast**
  2. **Ramping Product**
  3. **Price offers without mitigation**
  4. **Elimination of Nonsynch Reserves**
  5. **Online Secondary Reserves**
  6. **Modelling of Locational Reserves**

Objection 1. Reserves for PJM Load Forecast

- **The market does not require load to bid in the day-ahead market. A small subset of loads do not.**
- **Some LSEs have real-time LMP based tariffs. Some loads have hedging arrangements outside the market.**
- **Much of the load that does not bid DA is offset by generation that economically withholds DA, mostly wind and solar resources.**

Day-ahead vs Real-time Load





Generation by Fuel: Day-ahead vs. Real-time

	2026 (Jan-Mar)					
	Day-Ahead GWh	Percent	Real-Time GWh	Percent	RT - DA	Percent Difference
Coal	40,805.7	18.1%	39,973.1	17.6%	(832.7)	(2.0%)
Bituminous	34,417.7	15.2%	33,892.8	14.9%	(525.0)	(1.5%)
Sub Bituminous	4,540.2	2.0%	4,197.1	1.8%	(343.1)	(7.6%)
Other Coal	1,847.8	0.8%	1,883.2	0.8%	35.4	1.9%
Nuclear	68,871.4	30.5%	68,769.7	30.2%	(101.7)	(0.1%)
Gas	95,996.3	42.5%	95,911.3	42.1%	(85.0)	(0.1%)
Natural Gas CC	86,825.3	38.5%	86,038.9	37.8%	(786.4)	(0.9%)
Natural Gas CT	4,882.0	2.2%	5,673.7	2.5%	791.7	16.2%
Natural Gas Other Units	4,044.1	1.8%	3,964.4	1.7%	(79.7)	(2.0%)
Other Gas	244.9	0.1%	234.3	0.1%	(10.6)	(4.3%)
Hydroelectric	3,854.9	1.7%	3,921.5	1.7%	66.6	1.7%
Pumped Storage	1,855.7	0.8%	1,577.1	0.7%	(278.6)	(15.0%)
Run of River	1,999.2	0.9%	1,924.6	0.8%	(74.6)	(3.7%)
Other Hydro	0.0	0.0%	419.8	0.2%	419.8	NA
Wind	8,457.1	3.7%	10,725.5	4.7%	2,268.3	26.8%
Waste	932.2	0.4%	929.2	0.4%	(3.1)	(0.3%)
Oil	1,600.7	0.7%	1,655.4	0.7%	54.7	3.4%
Heavy Oil	25.7	0.0%	152.7	0.1%	127.0	493.3%
Light Oil	1,022.8	0.5%	975.3	0.4%	(47.5)	(4.6%)
Diesel	159.3	0.1%	125.9	0.1%	(33.4)	(21.0%)
Other Oil	392.9	0.2%	401.6	0.2%	8.7	2.2%
Solar	4,822.7	2.1%	5,396.0	2.4%	573.3	11.9%
Battery	4.6	0.0%	31.0	0.0%	26.4	574.7%
Biofuel	368.8	0.2%	299.3	0.1%	(69.5)	(18.8%)
Total	225,714.4	100.0%	227,611.8	100.0%	1,897.4	0.8%

Objection 1. Reserves for PJM Load Forecast

- **PJM proposes to carry extra reserves on high risk days based on the difference between the PJM load forecast and bid in load.**
- **Does not address the incentives of load and generation not participating day ahead.**
- **Not consistent with market design.**
- **All load would bear a cost based on behavior of a few.**
- **Results in higher prices without addressing the underlying issues.**

Objection 1. Reserves for PJM Load Forecast

- **PJM currently relies on advanced commitments and RAC commitments to address generation performance risk, load forecast and load forecast error.**
- **PJM's proposal does not address advanced commitments.**
- **PJM's proposal is not a replacement for RAC commitments.**
- **PJM's opinion is that the DASR/Energy Gap changes are more efficient than RAC commitments. This is theoretical. PJM has not shown how the DASR / Energy Gap will impact RAC commitments. PJM not shown a cost / benefit analysis of the two options.**

Objection 2: Ramping Product

- **PJM is proposing to create a ramping reserve product to address the fact that RTSCED does not look ahead far enough.**
- **A ramp product is not a substitute for multi-interval dispatch.**
- **PJM has not argued that a ramping product is superior to multi-interval dispatch.**

Objection 2: Ramping Product

- **PJM's concerns with multi-interval dispatch are related to pricing and settlements**
- **PJM is concerned that implementing a time coupled, multi-interval dispatch could:**
  - **Require out of market uplift payments and potentially suppress prices when the forecast does not materialize.**
  - **Lead to unintuitive pricing outcomes and disincentives to follow PJM dispatch if only the first interval in a multi-interval dispatch solution is settled.**
  - **Entail considerable additional complexity if a multi-interval settlement is implemented.**

Objection 2: Ramping Product

- **These are excuses. A ramping reserve product creates room to meet future demand needs by ramping units up (that otherwise would not ramp up) while maintaining or creating reserves from units that have an incentive to ramp up.**
- **This is an action that the DAM and ITSCED perform today. In the case of the DAM, the MW result in actual cleared MW. In the case of ITSCED, the information is used for committing units to meet expected load. It is not used for dispatch.**

Objection 3. Price offers without mitigation

- Prior to 2022 market changes, economic withholding occurred using offers up to $7.50 for Tier 2 synchronized reserves.
- Physical withholding also occurred.
- Tier 2 was a minority of the requirement, including only resources with explicit or opportunity costs.
- In 2022, the Tier 1 and Tier 2 reserves were combined into one product that receives the same clearing price.
- Economic and physical withholding were eliminated with cost-based offers and must offer requirement.
- Total reserve market revenues rose, while prices fell.

Objection 3. Price offers without mitigation

- **PJM proposes $10 per MW price-based offers for reserves, even without explicit costs.**
- **There is structural market power in the reserve markets, as documented in the SOM.**
- **Any explicit costs of providing reserves should go through the CDS, Manual 15 process.**
- **Price-based offers without market power mitigation would raise prices without a demonstrated benefit.**

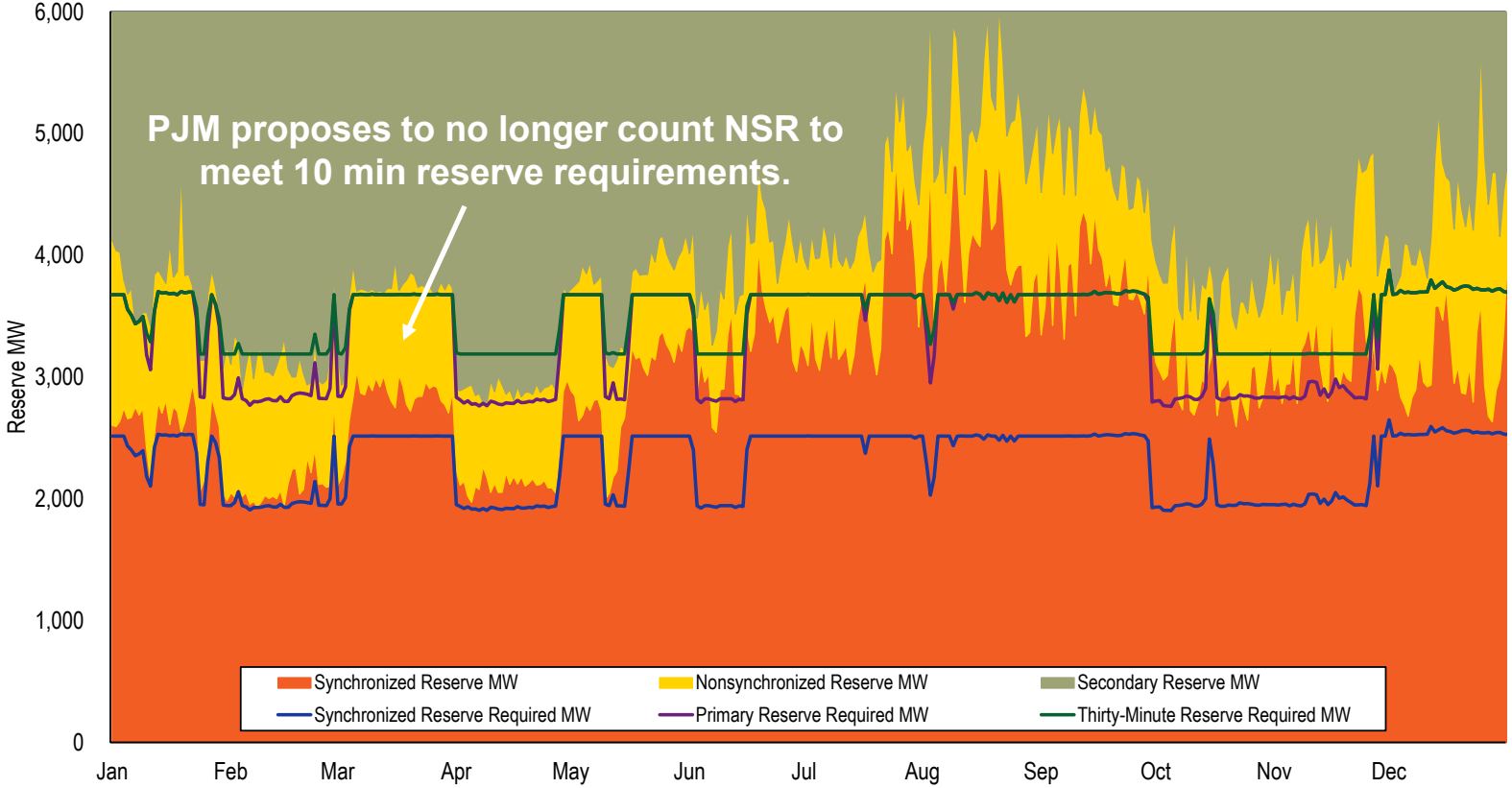
Objection 3. Price offers without mitigation

- **PJM also proposes cost-based offers for reserves above $10 per MW when approved by PJM.**
- **PJM review process has no criteria.**
- **PJM stated that these costs "would include any steps a resource owner needs to take day ahead to maintain availability to provide energy in real time if called upon."**
- **PJM's cost definition overlaps with capacity market avoidable costs.**

Objection 4: Elimination of Nonsynch Reserves

- **Nonsynchronized reserves (NSR) are available to PJM offline, with no opportunity cost.**
- **Many nonsynchronized reserve resources respond to the PJM All Call during synchronized reserve events, demonstrating their reliability.**
- **On average, PJM has 1,067 MW of NSR.**
- **PJM proposes to eliminate the product, pushing these resources into 30 minute reserves with no justification for reducing their value in the market.**
- **Eliminating NSR would make the market less efficient and raise prices without a demonstrated benefit.**

Daily Avg Reserves and Requirements: 2025



Objection 5. Online Secondary Reserves

- The PJM market has ample 30 minute reserves.
- An online only requirement is not necessary.
- There are no demonstrated issues with resources coming online in 30 minutes.
  - Issues identified during Winter Storm Elliott have been addressed through changes to notification time rules.
- Online reserves have opportunity costs with providing energy and 10 minute reserves, making them much more costly than their offline perfect substitutes.
- Requiring online only 30 min reserves is less efficient than a single 30 min requirement and would raise prices without a demonstrated benefit.

Objection 6. Modelling of Locational Reserves

- Ensuring that reserves are deliverable is important.
- IMM has recommended reevaluating PJM's definition of the reserve subzone since 2019 for this reason.
- PJM proposes to model constraint specific reserve requirements in addition to the base requirements.
- The proposal would impact transmission constraints and economic dispatch for both energy and reserves.
- The potential for unintended consequences for LMP and congestion call for further research, refinement, and testing of locational reserves modelling.

Category Components of Annual Load-Weighted Average LMP: 2024 and 2025

Component	2024	2025	Change in LMP	Percent of Total Change
Fuel and Consumables	$20.06	$29.99	$9.94	58.5%
Emission Related	$3.19	$3.44	$0.25	1.5%
Market Power Related	$5.16	$6.35	$1.20	7.1%
Scarcity	$0.17	$1.00	$0.83	4.9%
Transmission Constraint Penalty Factor	$3.01	$5.65	$2.64	15.5%
Ancillary Service Redispatch Cost	$1.33	$1.27	($0.06)	(0.3%)
Pre-emergency Demand Response	$0.00	$0.67	$0.67	4.0%
PJM Administrative Cap	$0.00	($0.08)	($0.08)	(0.5%)
All Other	$0.82	$2.43	$1.60	9.4%
Total Change	$33.74	$50.73	$16.99	100.0%

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