Performance Impact of Multi-Schedule Model on the Market Clearing Engine –Next Step

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- In October 2022, PJM conducted an education workshop on [combined cycle modeling](#) to highlight the challenges with configuration based models with the current multi-schedule model in Market Clearing Engine.

- In December 2022, PJM presented a [Problem Statement](#) (PS) and [Issue Charge](#) (IC) to address the performance Impact of Multi-Schedule Model on Market Clearing Engine with future configuration-based models for Combined Cycle, Energy Storage Resources, and hybrid resources.

- Stakeholders approved the IC in March 2023.

Four packages were developed in special sessions of the MIC to address this issue.

## At the October 2023 meeting, the MIC endorsed two packages:

MAIN MOTION	ALTERNATE MOTION
The PJM package (A) was endorsed with 77% in favor and 23% opposed.	The PJM/GT Power group package (B) was endorsed with 66% in favor and 34% opposed.
A second vote showed stakeholders preferred the PJM package (A) over status-quo with 77% in favor and 23% opposed.	A second vote showed stakeholders preferred the PJM/GT Power package (B) over status-quo with 68% in favor and 32% opposed.

- Package A was endorsed by the Markets and Reliability Committee and Members Committee in December 2023.

- PJM filed Package A with FERC on March 1, 2024 in Docket No. ER24-1387-000

- FERC rejected the filing on April 30, 2024.

In its rejection, FERC indicated its concern with what PJM filed.

- "under PJM's proposal, Market Sellers may be able to shift the clearing price away from a competitive level by submitting a market-based offer that includes a lower offer price and dispatch cost at EcoMin than its cost-based offer but much higher offer prices at MW output levels above EcoMin than its cost-based offer (i.e., the "crossing offer curves" scenario). …. Market Sellers would know which offer PJM will select when the resource is subject to an offer cap because the selection would be determined by a standalone calculation of dispatch cost. Based on the record here, we therefore find that PJM's proposal would create the ability for Market Sellers to exercise market power, which the commission has found unjust and unreasonable".

- "..that PJM does not propose to change the existing market power screening process, TPS test, or mitigation framework, we find that PJM's proposal would in fact change how PJM mitigates market power. Specifically, PJM's proposal would largely eliminate market power mitigation in the Day-ahead Energy Market by selecting for consideration in PJM's market clearing optimization software a single offer per resource solely on the lowest dispatch cost at EcoMin…..it would no longer mitigate a seller's offer to the offer producing the lowest total production cost by considering the entire offer curve for each of a seller's offers…"

- PJM plans to bring Package B (PJM/GT Power group) for endorsement at the MRC

  - First Read at MRC: June 27, 2024

  - Endorsement at MRC: July 24, 2024

  - Endorsement at MC: July 24, 2024

- Package B addresses FERC's concern about the exercise of market power.

  - Only market-based parameter limited offers will be used when a resource does not fail the Three Pivotal Supplier (TPS) test under emergency conditions.

  - Only cost-based offer(s) will be used when a resource fails the TPS test.

June

July

Aug.

2024

July 24
MRC, MC

June 27
MRC

First Read   Endorsement
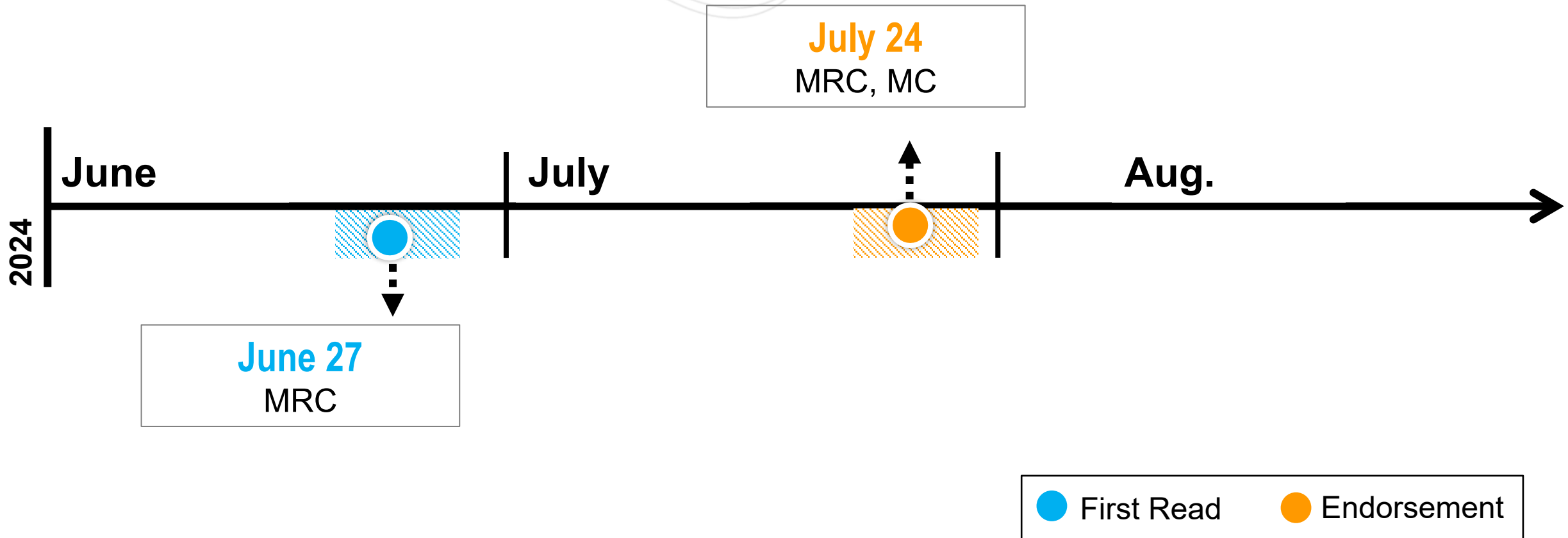
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[Performance Impact of Multi-Schedule

Model on the Market Clearing Engine]

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Appendix

PJM/GT Power group proposal (B)

- Changes to eligible offers for commitment and dispatch purpose both under emergency conditions and/or when resource fails Three Pivotal Supplier (TPS) test

- Changes to offer selection approach (Day-Ahead Market(DA), Real-time Market (RT)- Status quo)

  – Application of offer selection approach (Both DA and RT)

Eligible offers for commitment and dispatch purpose (Price-based resources)

		Fail TPS test*	Does not Fail TPS test
Non-emergency Conditions	Capacity resource	• ~~Price-Based offer~~ • Cost-based offer(s)	• Price-based offer
	Energy-only resource	• ~~Price-Based offer~~ • Cost-based offer(s)	• Price-based offer
Emergency Conditions	Capacity resource	• ~~Price-Based offer~~ • ~~Price-based PLS offer~~ • Cost-based offer(s)	• ~~Price-Based offer~~ • Price-based PLS offer
	Energy-only resource	• ~~Price-Based offer~~ • Cost-based offer(s)	• Price-based offer

- All Cost based offer(s) will be used for cost-based resources under all conditions (i.e. emergency conditions, non-emergency conditions, resource fails TPS test, resource doesn't fail TPS test). If price-based offer is not submitted for price-based resource then price-based PLS offer will be used. *Resource fails the TPS test and eligible for offer capping. Red striped texts are part of status-quo along with black texts.

The offer selection approach will **extend the formulaic approach** that is currently used in the RT market **to the DA market.**

DISPATCH COST FOR THE APPLICABLE HOUR =
[(Incremental energy offer@economic minimum for the hour [$/mwh]*economic minimum for the hour[mw]) + no-load cost for the hour ($/h)]

TOTAL DISPATCH COST =
Sum of hourly dispatch cost* over a resource's minimum run time($) + start-up cost ($)

The cost offer that results in the lowest Total Dispatch Cost will be selected for commitment and dispatch purpose.

NOTE: Total hourly dispatch cost will use the highest hourly cost for equivalent hours as the minimum run time.

Application of offer selection approach in both DA and RT :		
For all resource types other than those using configuration based models	**For Combined Cycle Model**	**For Energy Storage and Hybrid Resource Model**
Formulaic approach	Formulaic approach on the highest configuration that can start from plant offline state. The offer type selected on highest configuration will be used for all configurations.	Formulaic approach on discharge side of the offer curve.