Removing Storage Charging Limitations in Generator Interconnection Agreements (PAC-2024-3)

Planning Subcommittee

December 3, 2025

Purpose & Key Takeaways

Purpose:

Respond to the October 21 PSC presentation and summarize work plan for PAC-2024-3 going forward

Key Takeaways:

- MISO agrees there is room for improvement in study assumptions for storage and will explore potential process changes within interconnection and/or transmission planning studies
- Transmission service requirements for charging storage will be discussed separately under issue PAC-2023-2

Summary of Issue PAC-2024-3

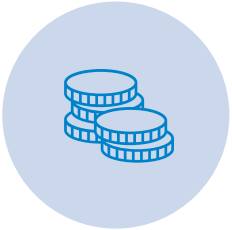
- Charging limitations may be assigned during generation interconnection, but there was no process defined to remove/adjust those limits as system conditions and assumptions change
- A short-term solution was implemented in 2024 to address the situation for storage resources currently active in the queue or with an existing GIA *(IPWG, resulted in BPM-015 update)*
- A longer-term solution can address potential improvements to MISO's overall planning study processes for charging storage *(PSC)*

MISO will be revisiting transmission service requirements for charging Electric Storage Resources (ESR) under PAC-2023-2

- Originally, this issue clarified policy that any type or duration of transmission service can be used to charge storage resources
- Currently "On Hold" on the MISO Dashboard, while waiting on requirements being developed for charging from co-located resources under issue MSC-2020-2 (Hybrid Resource Participation Model)
- MISO will move PAC-2023-2 to "Active" in 2026 and further discuss the idea of removing transmission service requirements for ESRs that have been studied in planning and follow MISO's dispatch
  - MISO is the only ISO/RTO that requires storage to obtain and pay for transmission service to charge even if following dispatch

MISO agrees with the stated reliability benefits of energy storage resources

Energy storage offers fast response for balancing the system and providing ramp capability and voltage support



Energy storage typically responds to security-constrained economic dispatch (SCED) price signals that alleviate system congestion

Energy storage can be built quickly compared to other resource types and help meet immediate needs driven by recent large load additions

Energy storage pairs well with variable energy sources to maximize interconnection service and help curtail congestion-driving injection

MISO received valuable feedback themes from IPWG stakeholders in 2024 related to this topic

- Study assumptions and modeling between the different MISO planning processes should be compared more in-depth and better reflect operational behavior of storage resources
- MISO should consider charging-related network upgrade cost allocation differences between the different planning processes
- Planning studies of charging storage should consider NERC Transmission Planning (TPL) Reliability Standards
- While charging storage should be treated comparably to other loads, MISO should consider its unique characteristics such as load profile during the day (i.e. operating characteristics)

FERC Order 2023 did not materially change MISO's current approach

- In Order 2023, FERC required transmission providers to use operating assumptions in interconnection studies that reflect the proposed charging behavior of electric storage resources
- FERC accepted MISO's compliance filing, which specifies that MISO will use its existing fuel-based dispatch assumptions and dispatch patterns in summer peak and shoulder peak as specified in BPM-015
- Failure of an interconnection customer to operate the storage resource in accordance with specified operating assumptions may breach the GIA

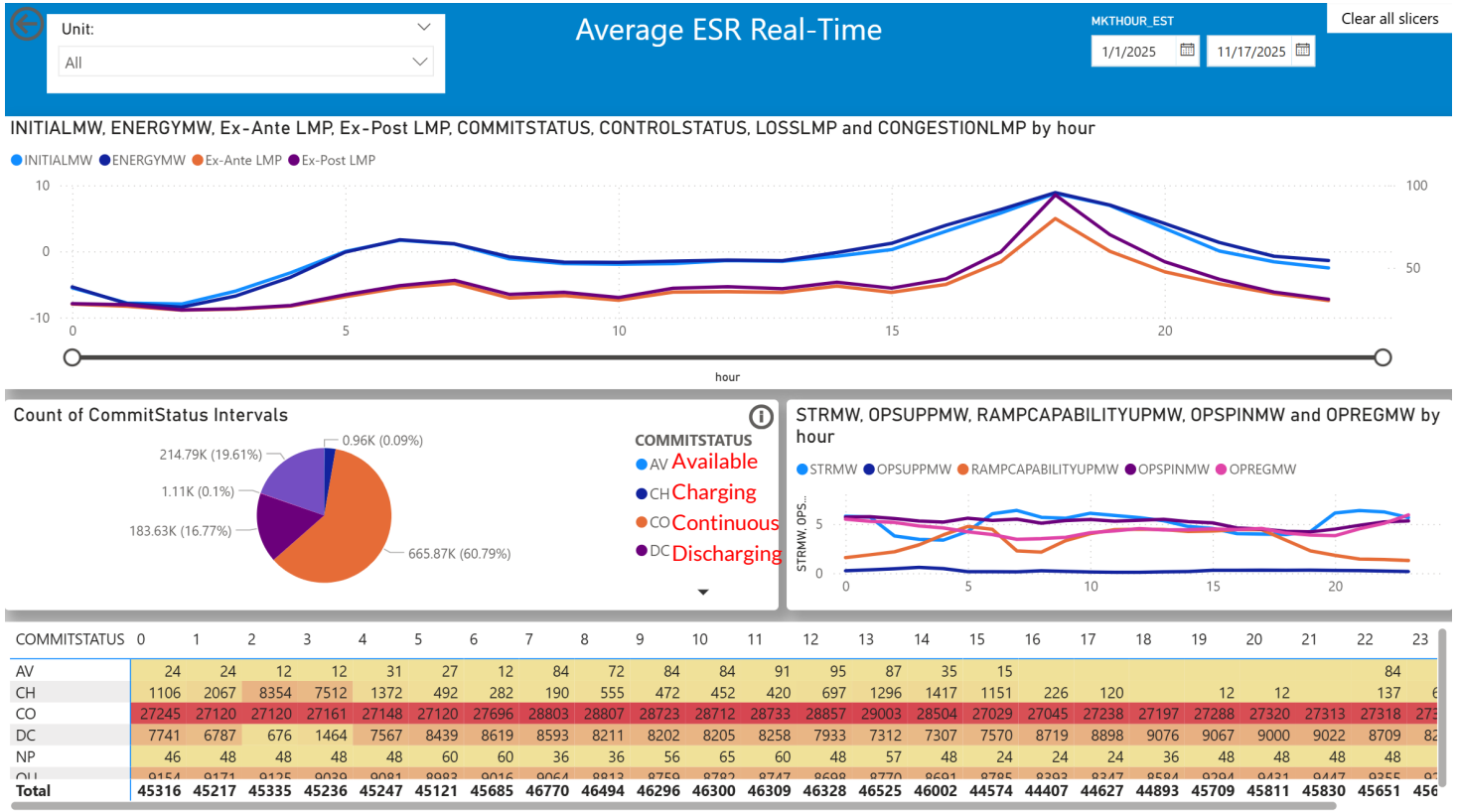
MISO generation interconnection studies storage at full injection in summer peak and full withdrawal in shoulder peak

From BPM-015, section 6.1.1.1.2:

Table 0-1 Dispatch per Fuel Type for Study and Higher Queued Generators (without a GIA)

Fuel Type under Study and Higher Queued	Summer Peak Dispatched as % of Interconnection Service	Shoulder Peak Dispatched as % of Interconnection Service
Combined Cycle	100%	50%
Combustion Turbine	100%	0%
Diesel Engines	100%	0%
Hydro	100%	100%
Nuclear	100%	100%
Storage[9]	100%[10]	- 100%, 0% [9,10]
Steam – Coal	100%	100%
Oil	100%	0%
Waste Heat	100%	100%
Wind	15.6%[11]	100%
Solar	100%	0%[12]

MISO is developing tools that provide additional insight into ESR operational and market behavior to help inform planning studies



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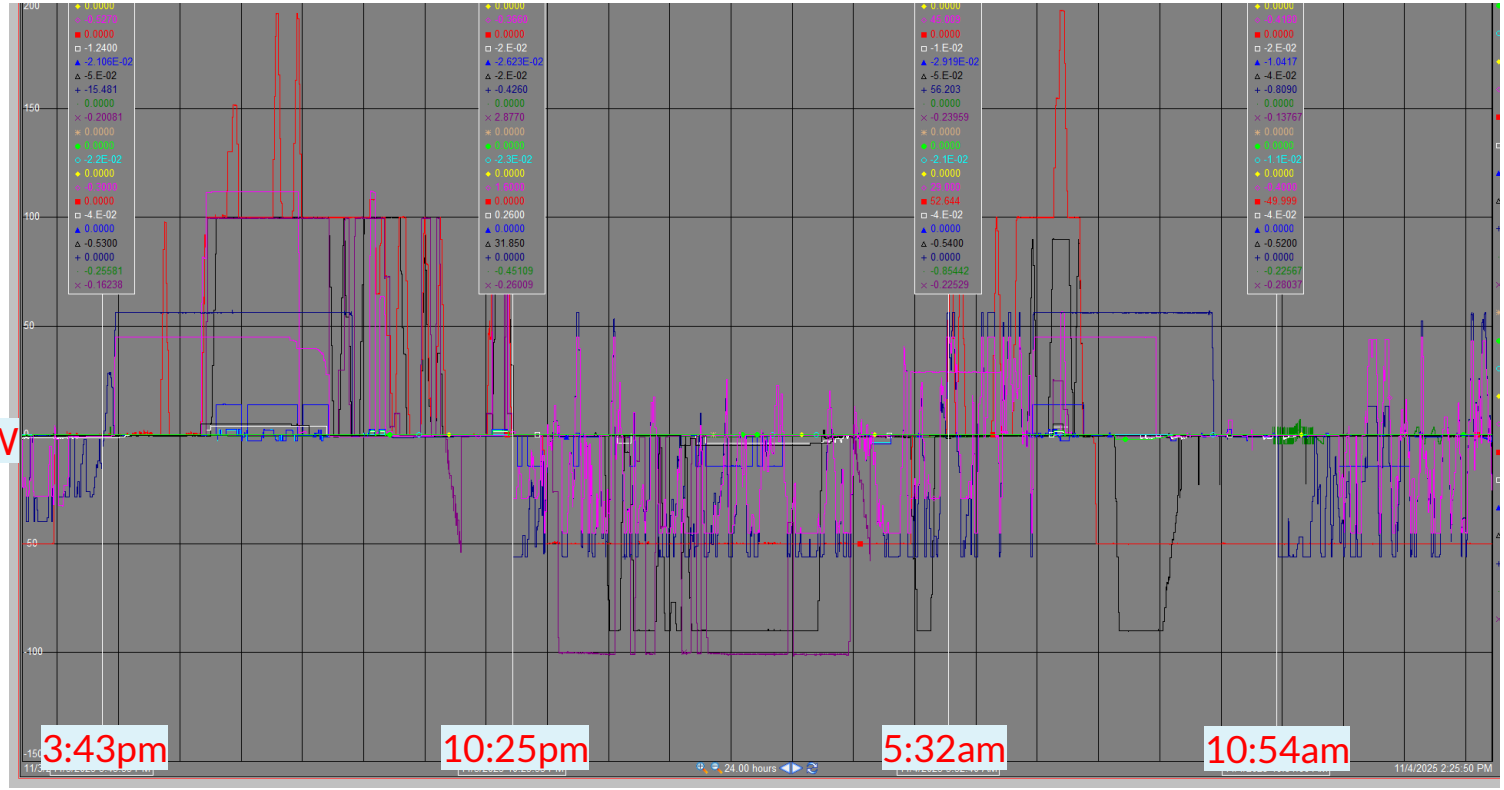
AV	24	24	12	12	31	27	12	84	72	84	84	91	95	87	35	15							84	
CH	1106	2067	8354	7512	1372	492	282	190	555	472	452	420	697	1296	1417	1151	226	120		12	12		137	6
CO	27245	27120	27120	27161	27148	27120	27696	28803	28807	28723	28712	28733	28857	29003	28504	27029	27045	27238	27197	27288	27320	27313	27318	27
DC	7741	6787	676	1464	7567	8439	8619	8593	8211	8202	8205	8258	7933	7312	7307	7570	8719	8898	9076	9067	9000	9022	8709	82
NP	46	48	48	48	48	60	60	36	36	56	65	60	48	57	48	24	24	24	36	48	48	48	48	
OU	9154	9171	9125	9039	9081	8983	9016	9064	8913	8759	8782	8747	8698	8770	8691	8785	8393	8347	8584	9294	9431	9447	9355	9
Total	**45316**	**45217**	**45335**	**45236**	**45247**	**45121**	**45685**	**46770**	**46494**	**46296**	**46300**	**46309**	**46328**	**46525**	**46002**	**44574**	**44407**	**44627**	**44893**	**45709**	**45811**	**45830**	**45651**	**456**

A recent 24-hour profile shows ESRs generally discharging during morning ramp and evening peak, while charging at other times



Next Steps

- More detailed analysis and comparison of Transmission Expansion (MTEP), Generator Interconnection (DPP), and Surplus Interconnection study assumptions and models
- Deeper dive into MISO Electric Storage Resource (ESR) operational behavior and market data
- Address transmission service requirements separately under Issue PAC-2023-2

Projected Timeline (subject to change)

Date	Venue	Summary	Feedback Request
10.21.25	PSC	Clean Grid Alliance re-introduced the issue	-
12.03.25	**PSC**	**MISO response to CGA, summarize work plan**	**-**
01.28.26	PSC	MISO details issue & solution(s), solicit feedback	Yes
03.11.26	PSC	Review feedback, recommend solution / BPM language	Yes
04.29.26	PSC	Summarize feedback, finalize solution / BPM	-
05.27.26	PAC	Introduce issue solution / BPM, request feedback	Yes
07.15.26	PAC	Review feedback, present final language	-
Q3-Q4 2026	-	MISO Legal review and posting of updated BPMs	

Questions?

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