Removing Storage Charging Limitations in GIAs

Dr. Rhonda Peters, Technical Consultant, Clean Grid Alliance

Oct 21, 2025

Discussion Overview

- Reliability Benefits of Energy Storage on the MISO System
- Policy Barrier to Storage on the MISO System – Inaccurate Charging Models
- Issue Submission History for PAC 2024-3 (Submitted Jan 2024)
  - Short Term Solution (Complete)
  - Long Term Solution (December 2025)
- Forward Looking

Reliability Benefits of Energy Storage on the MISO System

Variable Generation	Rapid large Load Expansion	ERAS Reliability Study Gaps	Desired Outcomes
• Wind • Solar • Fast Ramping • Ancillary Services	National and MISO Trend- Significant increase in large loads which has reliability and power quality impacts	Phase 3 DPP projects (90% reach COD) and ERAS projects are not modeled together in ERAS studies	• Strategically located Storage on the MISO grid can provide reliability support services that compensate for the absence of N-1ERAS transmission solutions • Storage can quickly ramp and ramp down to balance a sudden loss of large electric load or change in weather pattern impacting variable generation • Storage can peak shave and make efficient use of the existing transmission system
Energy storage is fast acting resource that can prevent catastrophic grid failures in milliseconds and can provide power quality support	Energy storage can be built quickly and in combination with variable generation can meet rapid spot load needs for reliable power in a short construction time frame	Strategically located storage is the best solution to compensate missing reliability upgrades needed to accommodate ERAS projects	

Barriers to Energy Storage on the MISO system

Battery Storage Behavior

- Battery storage is NOT a generator but can act like one
- Battery storage is NOT an interruptible load but it can act like one
- Battery storage provides positive and negative power similar to how a Static Var Compensator or STATCOM provide positive or negative reactive power – whatever is needed can/will be provided
- Battery Storage OBEYS price signals, being very dependent on arbitrage (buy lower sell higher) so its behavior can be predicted
- Storage will use its capabilities to financially optimize. If it is located on the opposite side of a constraint, it will behave different than the "fuel – based" dispatch assigned to it
- When storage is unnecessarily assigned costly upgrades, it is forced to drop from the queue and cannot reach COD. This financial barrier prevents MISO from realizing all the benefits that storage can provide to the grid

Desired Outcomes

- Address barriers to storage on the MISO system by increasing modeling accuracy in interconnection studies
- Review storage models to assess changes that can be made to more accurately reflect the unique electrical characteristics storage has.

Issue Submission History for PAC 2024-3

Issue Submitted in Jan 2024

- **Bifurcated into short and long term issues :** Short term: Create a mechanism to remove limitations in GIAs; Long term: Improve storage charging modeling so only relevant limitations make into GIAs

Short Term (Complete)

- **IPWG:** MISO Implemented Tariff and BPM rules to allow storage that is charging limited in its GIA to 1) Re-enter the queue for charging update 2) go through the MTEP process as a load and 3) Obtain transmission service (PTP or NITS) to remove limitations
- **Adjustments Needed:** The short-term issue requires further development to allow all storage ownership types to utilize the MTEP options (not just utility or utility affiliated storage projects). CGA will seek feedback on this discussion after the long-term issue (below) is complete

Long Term (Begin PSC Discussion December 2025)

- **Improve modeling to prevent charging limitations due to modeling inaccuracies :** Storage is a dispatchable device that responds to price signals to charge or inject power. While some adjustments have been made to improve modeling accuracy (i.e. remove injection in the shoulder model) more adjustments are needed to capture the unique nature of storage (multiple possibilities here such as ”opposite dispatch” where applicable, “connect and manage”, etc.)

Storage Historical Context

Storage Participation: ESR model created in 2022: Storage had been waiting for that in MISO, but moving forward in other markets like CAISO and ERCOT

MISO Not a First Mover: While MISO is often a first mover for innovative policies, it has significantly lagged behind other RTOs such as PJM, CAISO, ERCOT, SPP in regard to storage integration

Knowledge Base: MISO can leverage the knowledge base and experience in other RTOs in regard to battery storage

Ratepayer Benefit: Storage has immediate benefits for data centers that depend on rapid electrical response to loss of large electrical loads and degrade power quality

Driving Force: Long lead times and fuel pricing/supply insecurity for Gas, Coal and Nuclear, combined with increases in generation variability due increased solar wind and power quality issues and demands of data centers create a strong need for storage

Forward Looking

Storage Modeling Improvement Ideas

- **Quasi -Dynamic :** Account for the scenario when storage is on the other side of a constraint in models (model according to price signals)
- **Utilize MTEP or ERAS modeling technics:** LBA dispatch for storage charging, only prior queued generation with GIA, etc.

Storage Charging Transmission Service

- Can a Transmission Service study replace storage charging modeling in the GIP as an alternate path?
- If storage is studied and assigned upgrades in the GIP, and is dispatched to charge by MISO, should it still pay transmission service?

Additional Discussion/Contact Info

Rhonda Peters, Ph. D.
CGA Technical Consultant
intertranec@gmail.com
720-319-1860

Appendices

Appendix A: Background information

PAC 2024-3 MISO Dashboard Link

https://www.misoenergy.org/engage/MISO-Dashboard/removing-storage-charging-limitations-in-gias/#:~:text=Currently%20there%20is%20a%20policy,the%20Planning%20Subcommittee%20(PSC)

.