

Storage As a Transmission Asset (SATA) Working Item – Phase 2

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Systems Modeling

Operating Committee

January 8, 2026

Agenda for today's discussion:

- Background, history links in Appendix for previous meetings
- PJM Package comparison to FERC approved RTO/ISO Process
- SATA Settlements example/Impact to markets when deployed

Guiding Principles:

- SATA participation in PJM Markets is out of scope
- SATA operations should be similar to a wired solution
- Operational procedures should be as streamlined as possible
- SATA, during phase 2, is considered transmission only and not generation

Phase 2 Deliverable:

- Detailed design for transmission only asset operation and associated manual and tariff language building on 2020 Phase 1 proposal from Planning Committee

Gating criteria/expectations:

- Small MW's, local issue, high local DFAX
- Expect SATA to operate 4 hours or less
- Post-contingency (n-1), will be offline for the most part
- Solution will be similar to wired solution
- Solution will come from RTEP Planning studies, determined to be the most cost-effective solution compared to other wired solutions

- Purpose: To Demonstrate that PJM's package is in line with other RTO/ISO's who have approved SATA (Transmission Only) assets
- Given strong FERC precedent at MISO and ISO-NE, PJM's proposal is strongly aligned with both already approved by FERC processes

Core Element Design Comparison

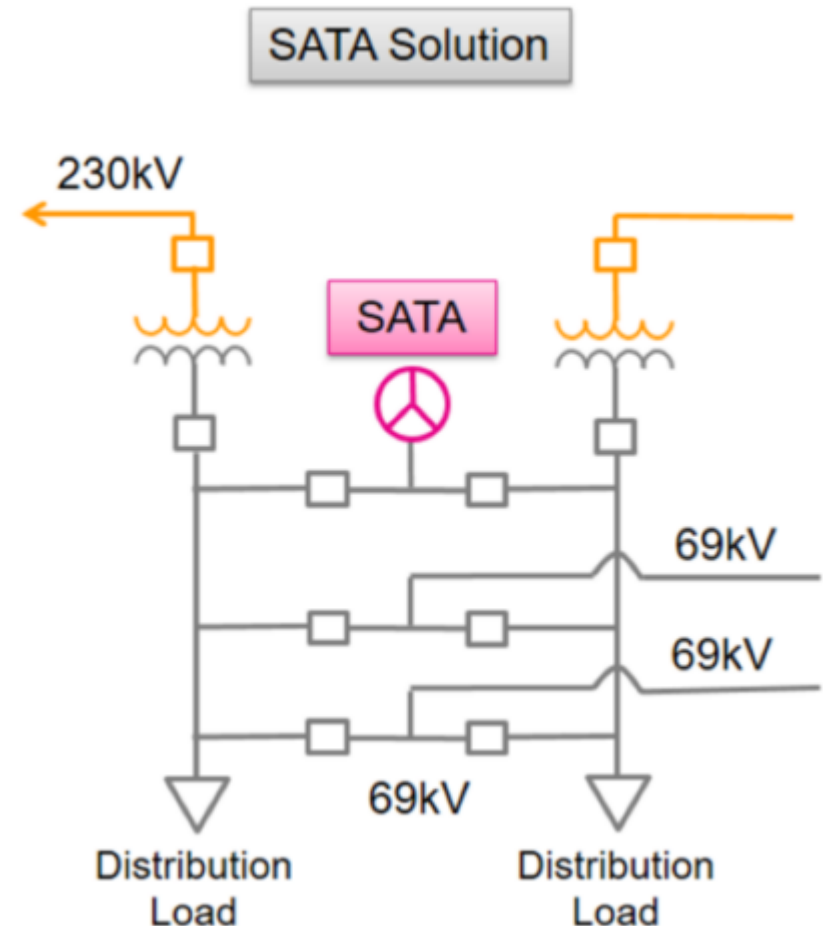
Core Design Element	Description	MISO	ISO-NE	PJM
Transmission-Only Classification	Storage planned, owned, and compensated exclusively as a transmission asset	✓	✓	✓
Selected Through Regional Planning	Identified as the preferred solution in the regional transmission planning process	✓ (MTEP)	✓ (RSP / Att. K)	✓ (RTEP)
Market Participation	Prohibited from all markets (DA, RT offers, Ancillary Services, Capacity)	✓	✓	✓
Price-Taker	Cannot submit bids/offers; settles at LMP only when charging or discharging	✓	✓	✓
Dedicated Pricing Node	Solely-assigned node used for settlement; no other trading permitted	✓	✓	✓
Operational Control by RTO	Dispatched under ISO/RTO functional control for reliability purposes only	✓	✓	✓
Wired-Asset Analogy	Operational impact treated as incidental, similar to lines, transformers, switching	✓	✓	✓
Cost Recovery Method	Cost-of-service transmission rates (not market revenues)	✓	✓	✓
Credit-Back of Energy Settlements	Any net charging/discharging costs or revenues flow back to transmission customers	✓	✓	✓
No Dual Recovery	Explicit safeguards preventing simultaneous market and transmission recovery	✓	✓	✓
Exit to Market Requires Interconnection	Must enter interconnection queue to become a market resource if transmission need ends	✓	✓	✓
FERC Determination	Found just and reasonable; not unduly discriminatory or preferential	✓	✓	TBD

- SATA annual cost of service will be determined by either Network Integration Transmission Service (NITS) or Transmission Enhancement Credits (TEC) methodologies*
- This calculates the annual revenue for the resource, [Cost Analysis](#) from PC on 09/25/2020 for additional information
- Resource receives annual cost of service rate and reconciles what was collected vs their actual costs in the prior year.
- Using that data the forecast for next year will be calculated

*this is how costs are calculated for other transmission assets

- SATA:
 - Used by Operations similar to a transmission wired solution
 - Does not offer into the PJM Energy Market
 - Price taker and reconciled at the respective bus LMP

- SATA used as automatic control for n-1 contingency and deployed to eliminate overload on transformer
- SATA discharges to eliminate overload on transformer
- SATA costs are calculated using LMP at connection point (price taker)
- When SATA use complete, charge also takes price at bus

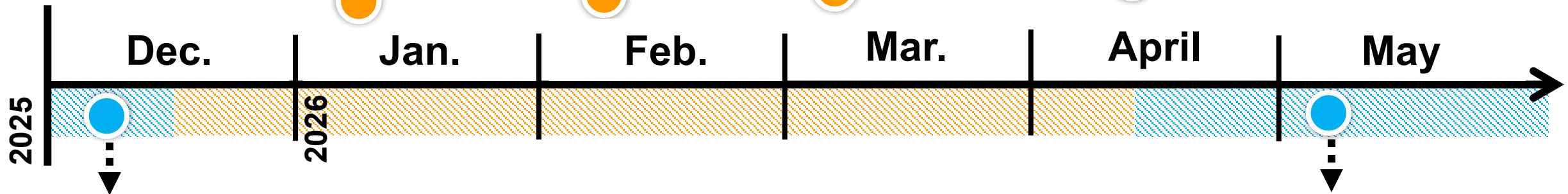


- Revenue Meter MWh reported via PowerMeter which is the standard practice for resources.
 - Resources may submit 5-minute or hourly MW values (which are scaled using RT Telemetry to the 5-minute level)
- Required modeling in separate sub-account to facilitate accurate accounting.
- Approved under reliability and costs recovered similar to the existing Network Integration Transmission Service (NITS) or Transmission Enhancement Credits (TEC) methodologies

- Both NITS and TEC revenue requirements are determined in advance of billing
 - Prior to filing the next Annual Revenue Requirement, each TO reconciles what was collected vs their actual costs in the prior year. The difference is accounted for in the next annual revenue requirement.
 - For SATA resources, the Energy revenues for charging/discharging can be forecasted in advance and reconciled in the next year's Revenue Requirement based on actual billing.

PJM
Highlighted
Time Period

January – March 2025
Package Voting/Delivery to MRC



**January
Operation
Committee**
Discussion
Package Assembly

**Phase 3 Discussion
planning**

● PJM ● Legend Entry

Appendix

- In June of 2020, PJM began analyzing how Energy Storage Resources [SATA Problem Statement](#) which initially began looking at all types of resources available and evaluation against planning criteria in this [presentation](#).
- At the conclusion of working item at PC, a [package](#) was developed and approved by Planning Committee.
- The package was moved to Markets and Reliability Committee and work was put on hold.
- Phase 2, building upon Phase 1 began as a working item in August of 2025 in Operating Committee

Date:	Working Group:	Link:
December 04, 2025	Operating Committee	SATA Phase 2 – Education SATA Phase 2 - Options and Package Matrix
November 03, 2025	Operating Committee	SATA Phase 2 - Education SATA Phase 2 - Options and Package Matrix
October 08, 2025	Operating Committee	SATA Phase 2 – Education SATA Phase 2 - Options and Package Matrix (pre-meeting) SATA Phase 2 - Options and Package Matrix (post-meeting)
September 11, 2025	Operating Committee	SATA Phase 1 Proposal SATA Phase 2 – Education SATA Phase 2 Options and Package Matrix
August 7, 2025	Operating Committee	SATA Phase 2 Issue Charge SATA Phase 2 Work Plan SATA Phase 2 Options and Package Matrix

OATT Schedule 12 and Manual M14B

Costs allocated to Responsible Customers

- Customers, including Merchant Transmission Facilities, aggregated into zones

General categories of transmission projects

- Regional Facilities \geq \$ 5M
Generally AC facilities that are either \geq 500 kV or double circuit 345 kV
Hybrid Allocation: 50% socialized based on load ratio shares and 50% Solution-Based DFAX (or 50% Stability Deviation Method)
- Lower Voltage Facilities \geq \$5M
Generally AC facilities that are below 500 kV
Allocation 100% Solution-Based DFAX (or 100% Stability Deviation Method)
- Local
Different types: <\$5M, <200 kV driver, standalone breakers
Allocation 100% to zone in which project is constructed

1. Network Integration Transmission Service (NITS) (OATT Section 34)
 - Each Transmission Owner (TO) determines and files an Annual Transmission Revenue Requirement to support capital and O&M expenses for their Transmission System assets
 - All Network Customers serving load in the applicable zone pay for that zone's Annual Transmission Revenue Requirements in proportion to their NSPL share in that Zone.
2. Transmission Enhancement Credits (TEC) (OATT Schedule 12)
 - If not included in NITS, TOs may recover costs associated with Required Transmission Enhancement projects through a separate transmission enhancement project revenue requirement
 - Total revenues allocated to the applicable transmission enhancement project owners, or the applicable network customers for zonal TOs that include these projected costs in their NITS rates.
 - All Network Customers serving load in a responsible zone pay for that zone's applicable share of all TEC revenue requirements in proportion to their NSPL share in that Zone.

Reference Name	Reference URL
Settlements Billing and Credit:	https://www.pjm.com/markets-and-operations/billing-settlements-and-credit
Network Integration Transmission Service Revenue Requirements & Rates example:	https://www.pjm.com/-/media/DotCom/markets-ops/settlements/network-integration-trans-service-june-2025.pdf
Transmission Enhancement Worksheet example	https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/mss/postings/2025/transmission-enhancement-worksheet-september-2025.xlsx
Planning Committee Presentations	https://www.pjm.com/-/media/DotCom/committees-groups/committees/pc/2020/20200925-special/20200925-item-04-cost-allocation-education.pdf https://www.pjm.com/-/media/DotCom/committees-groups/committees/pc/2020/20200706-special/20200706-item-03a-ferc-precedent-education.pdf
Manual 14B	https://www.pjm.com/-/media/DotCom/documents/manuals/m14b.pdf

Acronym	Term & Definition
LSE	Load Serving Entity
NITS	Network Integration Transmission Service
NSPL	Network Service Peak Load
OATT	Open Access Transmission Tariff

[PJM Glossary](#)

Acronym	Term & Definition
SATA	Storage as a Transmission Asset
TEC	Transmission Enhancement Credit
TO	Transmission Owner

[PJM Glossary](#)

Chair:

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SME/Presenter:

Storage as a Transmission Asset: Settlements
Proposal



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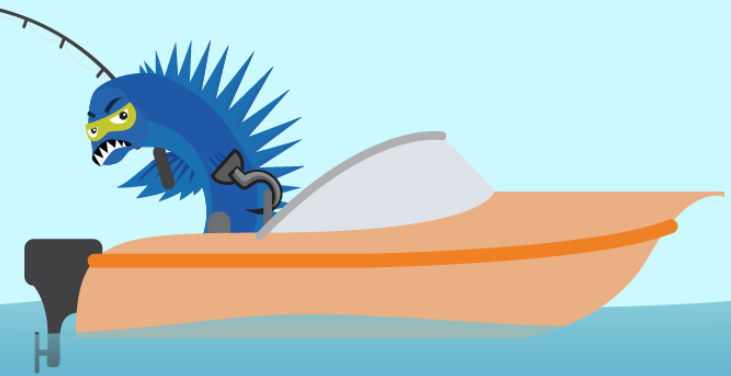
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MALICIOUS PHISHING
EMAILS**



Report suspicious email activity to PJM.
Call (610) 666-2244 or email it_ops_ctr_shift@pjm.com