

Order No. 2023 - Improvements to Generator Interconnection Procedures and Agreements



Operating Assumptions for Storage

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Presentation Overview

- Order No. 2023 includes provisions that would allow Interconnection Customers (IC) to indicate system condition assumptions for when a proposed battery storage resources would expect to charge
 - Additional control technology would be added to the facility to enforce this behavior
- ISO believes that this approach is inconsistent with ISO-NE Markets and would introduce significant operating inefficiencies compared with a more straightforward approach that is available to the region
- ISO is proposing an alternative approach as an Independent Entity Variation



Operating Assumptions for Storage

Order No. 2023 Requirements

- At the request of the IC, the ISO would be required to use certain operating assumptions in study processes that reflect the proposed charging behavior of an electric storage resource
- Allow ICs to resubmit their operating assumptions if the ISO finds the originally proposed operating assumptions are in conflict with good utility practice
- The operating assumptions must be submitted as part of the initial IR
- Require the IC to install additional control technologies (software and/or hardware)

ISO's Proposed Approach

- ISO is proposing an alternative proposal (independent entity variation)
 - No longer study storage resources charging at peak-load conditions
 - Avoid incorporating additional control technologies

Describing the Order No. 2023 Approach

- ICs would identify a system load level above which they would not expect to charge a proposed battery storage facility
- IC would install control technology that would prevent the battery from charging when the New England system load level exceeds the proposed limit



Concerns with the Order No. 2023 Approach

- Control technology that would limit the ability to charge the storage resource is inconsistent/in conflict with the approach used to manage storage resources in New England Markets
 - Storage resources charge and discharge based on energy market bids and prices
- Potential inefficiencies
 - Managing differences between day-ahead and real-time outcomes (load higher or lower than expected compared with the charging limit)
 - System-wide load level not always a good proxy for local constraints
 - Does not account for transmission outage or maintenance conditions (when the ability to charge may be different than expected in the interconnection study)
 - Charging may be limited more than is necessary
 - Does not account for continued additions of storage resources at the same location



Summary of ISO's Proposed Approach

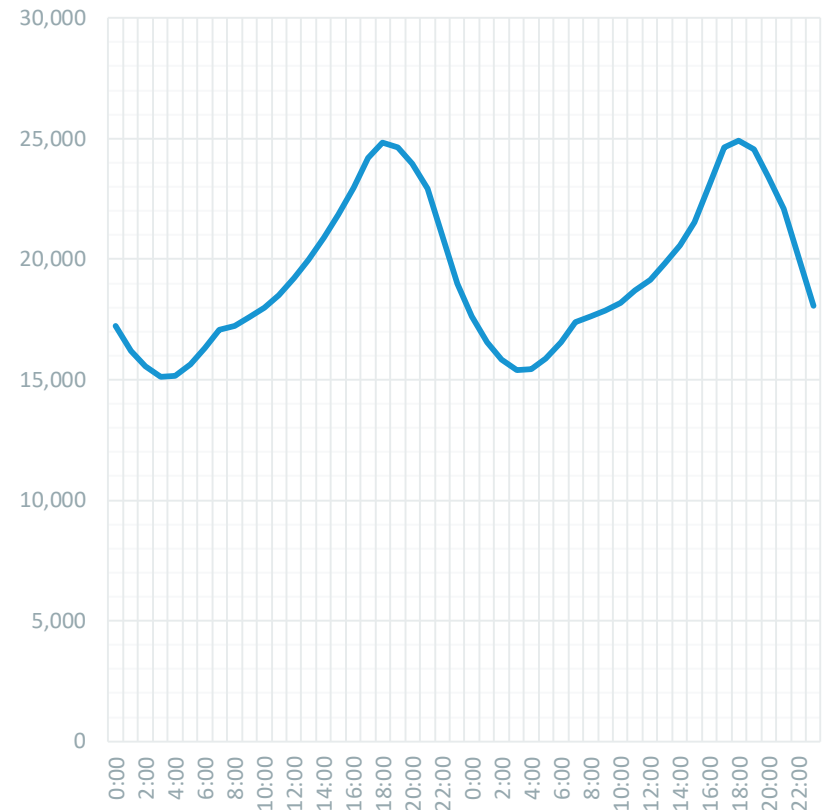
- Study proposed storage resources charging at a lower “shoulder” load level
 - No longer study proposed storage resources charging at peak load
- Rely on security constrained economic dispatch to govern the charging behavior in operations
 - Ensures reliable management to prevent overloads
 - Accounts for different operating configurations
 - Allows for competitive energy market bidding to determine which storage resources can charge
- Do not require the proposed storage to install the additional limiting control technology
 - The “control technology” will be the security constrained economic dispatch



What Level of System Load to Study Charging?

- During summer-peak conditions, load levels remain relatively high, even overnight
- Mid-day summer load levels should continue to reduce (duck-curve effect of additional PV)
- Consider addition of large quantities of storage resources
 - This will raise load levels during charging
- ISO is finalizing the proposed level of net shoulder system load and will present at the next TC meeting

NE Hourly Net Load (MW)
Consecutive Summer Peak Days
2027 Forecast



Net of energy efficiency & behind-the-meter PV

Questions

