

ESR Scheduling Performance Update & Proposal

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Agenda

- **Background on ESR Prototyping and Testing**
- **Performance Update**
- **Tariff Proposal**

Background - ESR Prototyping

- **The objective was to develop a dispatch model for Energy Storage Resource (ESRs) that can scale for future ESR growth, while meeting tolerances and performance levels that is acceptable to deploy the model in production.**
 - The latest EMS/BMS platform and optimization solver were used for the prototyping effort.
- **The NYISO's market software vendor, ABB, delivered a prototype for the ESR dispatch model in 2019**
 - The NYISO, with the support of ABB, tested the prototype for several months into early 2020
 - The testing that was performed compared the time it takes to solve a SCUC bid-pass, RTC, and/or RTD case with ESR units bidding ISO-Managed in the model against a baseline case with no ESR units.

Prototyping Update

- **Performance is generally acceptable, however, performance can degrade unexpectedly**
 - The average model performance in Security Constrained Unit Commitment (SCUC) when scaled to 25 ESR units (Base Case = 25 min, 25 ESR Case = 29 min).
 - The simulations performed show that the average model performance in Real-Time Commitment and Dispatch (RTC and RTD) when scaled to 100 ESR units.
 - RTC : Base Case = 114 sec, 100 ESR Case = 135 sec
 - RTD : Base Case = 55 sec, 100 ESR Case = 60 sec
 - Performance is measured by comparing the time it takes to solve the case with ESR units in the model against a baseline case with no ESR units.

Prototyping Update – Additional Findings

- **Bidding behavior of ESRs cannot be predicted ahead of time and the model is sensitive to changes in bidding behavior.**
 - Bid/Offer validation checks have been introduced where possible. However, the NYISO is not able to perform bid/offer validation that compares the offers submitted in one hour to the offers submitted in a different hour of the market-day.
 - Differences between the Bids an ESR submits in different hours of a market-day can result in the cost of withdrawing (or bidding at zero) for hour 1 and the cost of injecting in hour 14 failing to cover the ESR's stated round trip efficiency losses
- **The model's performance is sensitive to the value of round trip efficiency.**
 - The model is sensitive only when a large number of ESRs have a low round trip efficiency.
 - Resources in the interconnection queue is based on Li-Ion technology (batteries) that should have a high round trip efficiency (> 85%).
 - Round trip efficiency losses should be considered in the model so that that schedules are feasible.
- **The findings above are not an exhaustive list of the causes of performance degradation**
 - Therefore, the NYISO is proposing an amendment to the tariff to provide clarity on how the NYISO will handle managing future performance issues caused by the introduction of ESR energy management in the Day Ahead Market

Proposal

- **The NYISO proposes adding a provision in the tariff that would allow it to:**
 - Provide advanced notice to stakeholders of performance concerns no later than 4:00 p.m. on the day before Day-Ahead Bids must be submitted for a Day-Ahead Market (DAM) day; and
 - Suspend the using of use of ISO-Managed Energy Levels with Day-Ahead Market offers until the performance concerns have been addressed.

Tariff

- **MST 4.2 – The NYISO will notify the marketplace by 4 p.m. the afternoon before the Day Ahead Market (DAM) is executed of its decision to suspend the use of ISO-Managed offers**
- **The tariff has been posted with the other materials for today’s meeting**

Questions?

Next Steps

- **Request approval of the proposal at the April 8th BIC and April 15th MC**
- **Request Board approval of the proposal in April**
- **File revisions with the FERC in April**
 - This revision would be bundled with the other ESR revisions that were recommended for Board of Directors approval at the March 25, 2020 MC

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- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system

