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Independent System Operator

# ESR Mitigation Update


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## Market Issues Working Group:

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# Agenda

- Overview
- Mitigation Update
- Offer Price Capping
- New Unit Reference Clarification

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# Overview

# Overview

- During development for the Energy Storage Resource Project, issues that require tariff language cleanup were discovered including:
  - Generator offer caps, mitigation and reference levels (today's discussion)
  - Day-Ahead Margin Assurance Payments
  - Method for setting feasible Day-Ahead and real-time schedules
  - ICAP Supplier bidding requirements
- NYISO intends to include all of these updates in a single 205 filing
- The slides that follow will describe updates to the NYISO's initial proposal, which was presented at that February 26th MIWG, based on Market Participant feedback

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# Mitigation Update

# New Bid Validation Rules

- **The following bid validation rules were necessary to prevent performance issues with the SCUC, RTC, RTD and RCE software**
  - An offer curve for ESR's must include a MW segment at 0; and
  - There will also be bid validation logic that will ensure an ESR's offer curve properly accounts for the unit's efficiency losses.

| MWh | -20 | 0 | 10 | 20 |
|---|---|---|---|---|
| $ | A | B | C | D |

- **Using the offer curve above, the bid validation logic for bids/offers submitted into the day ahead and real-time energy market will perform the following check:**
  - $B \leq C\eta$
  - Where η is the units round trip efficiency

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# Problems Following Offer Submission

- **While this solution will ensure that as-submitted day ahead and real-time market offer curves for ESR's appropriately account for the unit's round trip efficiency, the offer curve could be altered after it has been submitted by:**

  - Offer Price Capping

    or

  - Mitigation

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# Example of Mitigation Issue

- Example of an ESR offer curve and the result of mitigation using a $4.00/MWh conduct threshold

| MWh | -20 | 0 | 10 | 20 |
|---|---|---|---|---|
| Bid $ | 10.00 | 30.00 | 38.00 | 50.00 |
| Reference $ | 9.00 | 27.00 | 32.00 | 40.00 |
| Target (ref + $4 threshold) | 13.00 | 31.00 | 36.00 | 44.00 |
| Conduct Test | Pass | Pass | Fail | Fail |
| Mitigated Curve $ | 10.00 | 30.00 | 32.00 | 40.00 |

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# Example of Mitigation Issue

- The mitigated offer curve on the previous slide would not passes the new bid validation rule, assuming the unit has a round trip efficiency of 85%

| MWh | -20 | 0 | 10 | 20 |
|---|---|---|---|---|
| Mitigated Curve $ | 10.00 | 30.00 | 32.00 | 34.00 |

- In this case, $30.00 is greater than $32.00 * .85 = $27.20

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# Updated Proposed Solution Responding to Stakeholder Comments

- Mitigation of offers to inject Energy will be adjusted to the minimum degree necessary to account for the Energy Storage Resource's round trip efficiency

| MWh | -20 | 0 | 10 | 20 |
|---|---|---|---|---|
| Mitigated Curve $ | A | B | C | D |

- Using the mitigated offer curve above, market close will perform the following:

  If $B > C\eta$, then C will be set to B/η

  - Where η is the units round trip efficiency
- Existing logic will ensure that the final mitigated energy curve is monotonically increasing

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# Example 1

| MWh | -20 | 0 | 10 | 20 |
|---|---|---|---|---|
| Bid $ | 10.00 | 30.00 | 38.00 | 50.00 |
| Reference $ | 9.00 | 27.00 | 32.00 | 40.00 |
| Target (ref + $4 threshold) | 13.00 | 31.00 | 36.00 | 44.00 |
| Conduct Test | Pass | Pass | Fail | Fail |
| Mitigated Curve $ | 10.00 | 30.00 | 32.00 | 40.00 |
| Adjusted Mitigated Curve $ | 10.00 | 30.00 | 35.30 (30/.85) | 40.00 |
| Final Mitigation Curve $ | 10.00 | 30.00 | 35.30 | 40.00 |

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# Example 2

| MWh | -20 | 0 | 10 | 20 |
|---|---|---|---|---|
| Bid $ | 10.00 | 30.00 | 38.00 | 50.00 |
| Reference $ | 9.00 | 27.00 | 32.00 | 34.00 |
| Target (ref + $4 threshold) | 13.00 | 31.00 | 36.00 | 38.00 |
| Conduct Test | Pass | Pass | Fail | Fail |
| Mitigated Curve $ | 10.00 | 30.00 | 32.00 | 34.00 |
| Adjusted Mitigated Curve $ | 10.00 | 30.00 | 35.30 (30/.85) | 34.00 |
| Final Mitigation Curve $ | 10.00 | 30.00 | 35.30 | 35.30 |

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# Proposed Tariff Language

23.4.2.2.1.1 If the substitution of a default bid or bid parameter(s) for any portion of the Incremental Energy Bid curve submitted for an Energy Storage Resource would result in a mitigated energy curve that is not consistent with the Energy Storage Resource's round trip efficiency, then the default bid or bid parameter(s) to inject Energy will be adjusted to the minimum extent necessary to ensure the difference between bids to withdraw Energy and bids to inject Energy incorporate the Energy Storage Resource's round trip efficiency.

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# Offer Price Capping

# Offer Price Capping

- The NYISO proposes to update the offer price capping logic so that offers to withdraw energy are capped at the lowest of the following:
  - The price of the energy offer
  - The price allowed by the current capping logic
  - The price required to account for the unit's round trip efficiency (new)
- The proposed solution is intended to ensure that no performance issues with SCUC, RTC and RTD arise
- The current price capping logic will continue to be applied if a unit's energy offer does not cross zero, and will be applied to all energy segments that are greater than zero
- Revisions to MST 23.7.2

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# Proposed Tariff Language

23.7.2.5 An Energy Storage Resource that submits an Incremental Energy Bid that exceeds $1,000/MWh may be subject to the alternative Bid Restriction specified below if its submitted Incremental Energy Bid curve extends from a Lower Operating Limit that is less than zero MW to an Upper Operating Limit that exceeds zero MW.

Under the circumstances specified above an Energy Storage Resource's Bid(s) to withdraw energy will be restricted to the lower of (a) a value calculated in accordance with the other provisions of this Sections 23.7.2, or (b) the maximum value that will ensure the difference between Bids to withdraw Energy and Bids to inject Energy incorporate the Energy Storage Resource's round trip efficiency.

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# New Unit Reference Clarification

# New Unit Reference Clarification

- **Energy Storage Resource Reference Levels should only be calculated using cost-based Reference Levels**
  - Current tariff language would require ESRs that are New Capacity to have a New Unit Reference Level
  - New Unit Reference Levels are based on historical LBMPs and would not be representative of ESRs costs or operating parameters such as round trip efficiency
- **New tariff language is needed to explicitly exempt ESRs from requiring a New Unit Reference Level**
- **Revision to Section 23.1.4.3**

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# Proposed Tariff Language

23.3.1.4.3 Notwithstanding the foregoing provisions, the reference level for Incremental Energy Bids for New Capacity, excluding Energy Storage Resources, for the three year and six month period following the New Capacity's first production of Energy while synchronously interconnected to the New York State Transmission System shall be the higher of (i) the amount determined in accordance with the provision of Section 23.3.1.4.1 or 23.3.1.4.2, or (ii) the average of the fuel price-adjusted peak LBMPs over the twelve months prior to the New Capacity's first production of Energy while synchronously

# Questions?

# Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit to consumers by:

- 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

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