

Energy Storage Resources- Manuals Updates

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Agenda

- **Manual Updates for Energy Storage Resources**
 - Day Ahead Scheduling Manual
 - Transmission & Dispatch Operations Manual
 - Ancillary Services Manual
- **Next Steps**

Day Ahead Scheduling Manual

Revisions – Day Ahead Scheduling Manual

- **Section 2.3.1**
- Added language for additional factors considered for Energy Storage Resources in SCUC
- ***Security Constrained Unit Commitment (SCUC)*** – The SCUC produces the generating unit commitment schedule and Firm Transaction schedules for the next day’s operation. Factors considered by SCUC :
 - Current generating unit operating status
 - Constraints on the minimum up and down time of the generators
 - Generation and start up bid prices
 - Plant-related startup and shutdown constraints

Revisions – Day Ahead Scheduling

Manual Section 2.3.1 (cont)

- ***Security Constrained Unit Commitment (SCUC)*** – The SCUC produces the generating unit commitment schedule and Firm Transaction schedules for the next day’s operation. Factors considered by SCUC :
 - Minimum and maximum generation constraints
 - Generation and reserve requirements
 - Transmission facility maintenance schedules
 - Transmission constraints
 - Phase angle regulator settings
 - Transaction bids
 - Minimum and Maximum Energy Level constraints (for ESR Generators only)
 - Bid Beginning Energy Level for ESR (for ISO Managed ESR only)

Revisions – Day Ahead Scheduling Manual

- **Section 4.2.3**
- Added language in Initial Generator Status and Commitment Rules for Energy Storage Resources
- ***Beginning Energy Level (For ESR Units only)***
 - SCUC honors the Beginning Energy Level (for ESR bidding ISO Managed) within the 24-hour evaluation period only; requirements across midnight are not recognized. An ESR unit will be scheduled based on their Beginning Energy Level for the market day.
- **Section 4.2.4**
- Added language in Scheduling a “Must Run” Generator for Energy Storage Resources
- **Section 4.5**
- Added Section for Energy Storage Resources Constraint Evaluation

Revisions – Day Ahead Scheduling Manual

- **Section 4.2.4**
- Added language in Scheduling a “Must Run” Generator for Energy Storage Resources
- ***Submit a Low Incremental Energy Bid***
 - The dispatch curve is used between the minimum and upper operating points to dispatch the unit. If not the marginal unit, a generator will receive the higher Locational Based Marginal Price at its bus, regardless of its bid. If many generators are vying for a “must-run” schedule within an area, a negative bid may prove necessary to be scheduled, especially if others are bidding negative. **If an ESR Unit is trying to be scheduled to charge (Negative MWs), a positive bid may prove necessary to be scheduled to charge. However, when bidding a negative or positive value, the generator risks setting the price and having to pay to operate depending if they get scheduled to produce or charge.** Also, the SCUC and RTC software minimize production costs over multiple hours, so all hours must be strategically bid together. For example, the hourly bids of a unit would be evaluated over all the hours that it could be scheduled, given its minimum run time or down time constraints.

Update – Day Ahead Scheduling Manual

- **Added Section for Energy Storage Resources Constraint Evaluation**
- **4.5 Energy Storage Resource Constraint Evaluation**
 - **4.5.1 Energy Storage Limits Constraint**
 - For Energy Storage Resources, only Energy and not regulation nor 10 min nor 30 min synchronous reserves will be accounted for in the storage limits (LSL and USL) constraints in DAM for all passes.
 - **4.5.2 MW Capacity Constraints**
 - The MW Capacity Constraint for Energy Storage Resources will be treated the same as traditional generators, but shall account for negative MW energy schedule, as well as negative capacity upper and lower limits (operating, economic, and regulation limits).
 - **4.5.3 Ramp Constraints:**
 - The Ramp Constraint for Energy Storage Resources will be treated same as traditional generators, but shall account for negative MW energy schedule.

Transmission & Dispatch Operations Manual

Revision – Transmission & Dispatch Operations Manual

■ 6.1.1 Real-Time Commitment Process

■ Added language in Real- Time Commitment Process for Energy Storage Resources

■ **Storage Limit for ESR (Energy Storage Resources)**

- The Energy Storage Limit (Lower Storage Limit and Upper Storage Limit) constraints will be enforced in all the hours within the optimization horizon for each market run.

■ **ESR Generators**

- ESRs can operate in one of two modes – ISO-Managed or Self-Managed.
- ISO-Managed Energy Level mode shall respect the resource's bid-in Upper Storage Limit (USL MWh) and Lower Storage Limit (LSL MWh) in the scheduling of energy, and regulation (for the dispatch interval duration), and spinning reserve (for 1-hour duration) for RTC/RTC –AMP and RTD/RTD-CAM for binding as well as advisory dispatch intervals.
- Self-Managed Energy Level mode shall NOT consider the resources bid-in Upper Storage Limit (USL MWh) and Lower Storage Limit (LSL MWh) in the scheduling of energy, spinning reserve and regulation for RTC/RTC-AMP for binding as well as advisory dispatch intervals and RTD for advisory intervals.

Revision – Transmission & Dispatch Operations Manual

- **Section 6.7.4 Out-of-Merit Generation**
- **Added language in Out-of-Merit section for Energy Storage Resources**
 - From time to time, generators must be operated out of economic order or at levels that are inconsistent with the calculated schedules. Any NYISO-authorized deviation from the schedule is considered Out-of-Merit (OOM) Generation and is not subject to regulation penalties. A unit that is out-of-merit is balanced at actual output and may be eligible for a supplemental payment if its bid production cost is not met. **In addition to the OOM for MWs, ESR can be Out-of-Merited for MWh as well.**

Revision – Transmission & Dispatch Operations Manual

■ 7.3. RTC/RTD Solution Process

■ Added language in RTC/RTD Solution Process for Energy Storage Resources

- RTC/RTD calculates a short-term generation schedule, referred to as a “base point,” for each of the generating units designated as flexible or “on-dispatch.” RTC/RTD retrieves the information it needs to perform the calculation from data maintained in the NYCA databases. This information includes incremental bid cost curves of the generating units, telemetry data, and other data needed to model each of the constraints.

Revision – Transmission & Dispatch Operations Manual, Section 7.3 (cont)

RTC/RTD determines the initial conditions to begin the commitment and dispatch process.

These initial conditions include:

- a) Real-time telemetry values for generation output, which represents the initial generation MW values.
- b) Forecasted values of zonal, load, and the last RTD powerflow transmission zonal losses.
- c) Real-time telemetry values for phase angle regulator flows, which represent their initial power schedule if optimized; otherwise the real-time telemetry represents their final power schedule.
- d) Real-Time telemetry values to model unscheduled transmission system powerflows such as Lake Erie Circulation.
- e) Current facility outage schedules, including forced and scheduled outages and any outages that affect system transfer limits.
- f) For LESRs real-time telemetry of energy storage levels.
- g) For ESRs real time telemetry of energy storage levels.

Ancillary Services Manual

Revisions – Ancillary Services Manual

- **Section 6.1 Description**

- Added language in Types of Operating Reserves for Energy Storage Resources

- Operating Reserve service provides backup generation and/or demand response in the event that the NYISO experiences a real time power system Contingency requiring emergency corrective action. In order for the New York Control Area (NYCA) to respond in a timely fashion, the reserves must be available from Generators or Demand Side Resources located within the NYCA and within specific regions, as required by the NYSRC.

Types of Operating Reserves

- ***10-Minute Spinning Reserve*** – Operating Reserves provided by qualified Generators, **qualified Energy Storage Resources** and qualified Demand Side Resources located within the NYCA that are already synchronized to the NYS Power System and can respond to instructions from the NYISO to change output level within 10 minutes. Spinning reserve may not be provided by Behind-the-Meter Net Generation Resources that are comprised of more than one generating unit that are dispatched as a single aggregate unit.
- ***10-Minute Non-Synchronized Reserve (10-Minute NSR)*** – Operating Reserves provided by Generators that can be started, synchronized, and loaded within 10 minutes. Operating Reserves may also be provided by Demand Side Resources where the demand response is provided by a Local Generator or by Behind-the-Meter Net Generation Resources that are comprised of more than one generating unit that are dispatched as an aggregate unit.
- ***30-Minute Spinning Reserve*** – Operating Reserves provided by qualified Generators, **qualified Energy Storage Resources** and qualified Demand Side Resources except Behind-the-Meter Net Generation Resources that are comprised of more than one generating unit and dispatched as a single aggregate unit located within the NYCA that are already synchronized to the NYS Power System and can respond to instructions from the NYISO to change output level within 30 minutes.

Revisions – Ancillary Services Manual

- **Section 6.2.2 Supplier Eligibility Criteria**
- **Added language in Supplier Eligibility Criteria for Energy Storage Resources**
 - The NYISO shall enforce the following criteria, which define which types of Generators or Demand Side Resources are eligible to supply particular Operating Reserve products.
 - *Spinning Reserve* – Generators or Demand Side Resources that are not supporting their Demand Reduction through the use of Local Generation that are ISO-Committed Flexible or Self-Committed Flexible; are operating within the dispatchable portion of their operating range (which for offers by BTM:NG Resources corresponds to quantities in excess of its Host Load and subject to its Injection Limit); and are capable of responding to NYISO instructions to change their output level within ten minutes, shall be eligible to supply Spinning Reserve. Behind-the-Meter Net Generation Resources that are comprised of more than one generating unit that are dispatched as a single aggregate unit are not qualified to provide Spinning Reserves. **ESR units that are capable of responding to NYISO instructions to change their output level within ten minutes, shall be eligible to supply Spinning Reserve**
 - **30 Minute Reserve (spinning and non-synchronized) – Energy Storage Resources will be eligible to provide 30-Minute spinning reserve.**

Revisions – Ancillary Services Manual

- **Section 6.3.1 Bidding and Bid Selection**
- Added language in Bidding and Bid Selection for Energy Storage Resources
- **ESR are only qualified to bid synchronous reserves. ESR do not bid Minimum Generation MWs, Minimum Generation costs or Start-Up costs.**
- The NYISO may schedule Suppliers that make themselves available to provide Operating Reserves up to the following maximum Operating Reserve levels:
- For Spinning Reserves, the Resource's emergency response rate multiplied by ten.
- For 10-Minute Non-Synchronized Reserves, or for non-synchronized 30-Minute Reserves, the Resource's UOLN or UOLE, whichever is applicable at the relevant time (the Resource may offer one product or the other depending on the time required for it to start-up and synchronize to the grid).
- For synchronized 30-Minute Reserves, the Resource's emergency response rate multiplied by 20. This represents the amount of spinning reserve, above and beyond 10-minute spinning reserve, that the Resource could convert to energy within 30 minutes.

Next Steps

- **Transmission & Dispatch Operations Manual**
 - August 6, 2020 – SOAS
 - August 12, 2020 – BIC
 - August 13, 2020 – OC
- **Day Ahead Scheduling Manual**
 - August 6, 2020 – SOAS
 - August 12, 2020 – BIC
 - August 13, 2020 – OC
- **Ancillary Services Manual**
 - August 6, 2020 – SOAS
 - August 12, 2020 – BIC
 - August 13, 2020 – OC

Administrative Updates

- **Ancillary Services Manual**
- This set of revisions includes language from previously-approved version 5.1 (June 2019, BIC & OC) that was inadvertently omitted from the currently posted document.

- **Transmission & Dispatch Operations Manual**
- This set of revisions includes language from previously-approved version 4.4 (September, 2019 OC) that was inadvertently omitted from the currently posted document.

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



Questions?