DER Eligibility and Performance Obligations

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Purpose of Today's Meeting

- DER Overview
- Meter Data Study Update
- Overview: Eligibility & Day-Ahead and Real-Time Performance Obligations
- Review Current Supplier Registration and Offer Parameters
- Review Current Commitment and Dispatch Concepts

Background

Date	Working Group	Discussion points and links to materials
02-02-17	Posted	Distributed Energy Resources Roadmap for New York's Wholesale Electricity Market
02-28-17	Market Issues Working Group (MIWG)	DER Roadmap: Aggregation Participation Model
04-28-17	Market Issues Working Group (MIWG)	DER Roadmap: Aggregation Participation Model
05-23-17	Market Issues Working Group (MIWG)	DER Roadmap: Measurement & Verification, Monitoring & Control and Meter Data Study

Purpose of the DER Roadmap Effort

- Develop a Dispatchable DER Participation Model for the NYISO markets
- Create a model that supports the **NYISO Market Design Vision** - *Attract and retain the most efficient resources to meet NY's reliability needs.*

DER Roadmap Concepts

- **NYISO is developing the following concepts through the stakeholder process:**
  - Aggregations (Feb. 28 & Apr. 28, 2017)
  - Measurement and Verification (May 23, 2017)
  - Real-Time (RT) & Day-Ahead (DA) Eligibility Criteria and Performance Obligations (Jun. 21, 2017)
    - RT Operational Requirements and Resource Obligations
    - DA Operational Requirements and Resource Obligations
  - Installed Capacity Eligibility Criteria and Performance Obligations
  - Dual participation in wholesale markets and retail programs
- **NYISO will present a full market design to stakeholders after these concepts have been finalized**

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DER - Review

- DER is a resource or set of resources -- *typically located on an end-use customer's premises and operated for the purpose of supplying customer electric load* -- that seeks to provide NYISO wholesale market services

Meter Data Study Update

- NYISO is currently evaluating feedback received in response to the Meter Data Study presentation at the 5/23 MIWG
- NYISO will post the list of questions that will be reviewed in the Meter Data Study once finalized

Overview: Eligibility & Day-Ahead and Real-Time Performance Obligations

- **In addition to meeting minimum aggregation criteria (discussed Feb. 28 & Apr. 28, 2017), a DCEA must meet additional eligibility requirements to provide Energy and Ancillary Services**
  - NYISO will review existing criteria applicable to Generators and Demand Side Resources and determine what modifications, if any, should be made for DER
  - Additional eligibility criteria may be developed
- **Existing RT & DA Operational Requirements and Resource Obligations**
  - Aggregation & Supply Offer Parameters (Bidding Model)
    - Existing Generator and Demand Response supply offer attributes
  - RT Dispatch (RTD), RT Commitment (RTC) & DA Security Constrained Unit Commitment (SCUC)
  - Energy and Ancillary Services Eligibility Criteria
  - Incorporating FERC Order 745 concepts for Offer Floor/Net Benefits Test
- **RT & DA Settlements**
  - FERC Order 745 directive for cost allocation

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Eligibility and Performance Obligations for DER

- This presentation outlines the existing eligibility and performance obligations for Generators.
- Subsequent presentations will describe the NYISO's proposals for DER
  - Application of existing eligibility requirements, performance obligations as well as DER registration and offer parameters
  - Potential for application of new rules to DER of various resource types

Review of Current Supplier Registration and Offer Parameters

Current Supplier Registration Parameters

- Generation Type – Gas Turbine, Nuclear, Renewable, Other, etc
- Response Rates
  - Emergency Response Rate (MWs/Min)
  - Regulation Capacity Response Rate (MWs/Min)
  - Normal Response Rate 1 (MW/Min)
  - Normal Response Rate 1 (MW)
  - Normal Response Rate 2 (MW/Min)
  - Normal Response Rate 2 (MW)
  - Normal Response Rate 3 (MW/Min)
- Physical Min Gen (MW)

Current Supplier Registration Parameters cont.

- Estimated Summer Operating Capacity (MW @ x degrees F)
- Estimated Winter Operating Capacity (MW @ x degrees F)
- DAM and RTM Bid options desired
  - Fixed Energy
  - Dispatch Energy
  - 10 Minute Spinning Reserves
  - 30 Minute Spinning Reserves
  - 10 Minute Non-Synchronized Reserves
  - 30 Minute Non-Synchronized Reserves
  - Regulation Control
  - Voltage Support

Current Supplier Offer Parameters

- Market – DAM/RT
- Date/Time (including each hour being offered)
- Upper Operating Limit (MW)
- Emergency Upper Operating Limit (MW)
- Minimum Generation (MW)
- Minimum Generation Cost ($)
- Operating Mode
  - ISO committed (fixed/flexible)
  - Self committed (fixed/flexible)
  - Fixed – fixed operating level that can be specified in 15min increments, no real-time dispatch evaluation, ineligible for reserve or regulation
  - Flexible – flexible operating level, follows 5min basepoints

Current Supplier Offer Parameters (cont')

- Self Scheduled MW (MW) – 15 minute MW schedule values
- Host Load (MW) – for BTM:NG Resources only
- Bid Curve (MW/$ per MW)– up to 11 point curve representing the incremental cost to supply
- Ancillary Services
  - 10 Minute Spinning Reserves ($/MW) – single $ cost value (DAM only)
  - 10 Minute Non-Synchronized Reserves ($/MW) – single $ cost value (DAM only)
  - 30 Minute Spinning Reserves ($/MW) – single $ cost value (DAM only)
  - 30 Minute Non-Synchronized Reserves ($/MW) – single $ cost value (DAM only)
  - Regulation Movement ($/MW) – single $ cost value (DAM & RTM)
  - Regulation Capacity (MW and $/MW) – both the MW amount and single $ cost value (DAM & RTM)

Supplier Offer Commitment Parameters*

- Minimum Run Time – min hours unit must run once started by NYISO
- Minimum Down Time – min hours unit must be down once de-committed by NYISO
- Maximum Stops/Day – number of times unit can be de-committed in dispatch day
- Startup Cost Curve (startup cost $ or hours offline/startup cost $) – 2 options, discrete cost value or up to 6 point curve representing cost to start after being offline for a specified number of hours
- Startup Notification Time Curve (hours to start/hours offline) – up to 6 point curve representing time to start after being offline for a specified number of hours

**Commitment parameters currently only apply to generators*

Review of Current Commitment and Dispatch Concepts

Day-Ahead Commitment

- **The NYISO's SCUC software is a multi-period, security constrained unit commitment process that co-optimizes to solve simultaneously for Load, Operating Reserves, and Regulation Service on a least as-bid production cost basis over a twenty-four hour optimization period.**
  - Evaluates day-ahead offers, identifies unit commitments & financially binding schedules for generators and bilateral transactions for twenty-four, one hour intervals
- **SCUC evaluates the following resource parameters:**
  - Day-ahead outages
  - Preliminary zonal load forecasts
  - Generation offers
  - NYISO load forecasts
  - LSE load bids
  - Virtual bids/offers; and
  - External transactions

**See section 3 (NYISO Market Mechanics) of the Market Participants User's Guide for more details*

Real-Time Commitment

- **The NYISO's RTC software is a multi-period, security constrained unit commitment and dispatch process that co-optimizes to solve simultaneously for Load, Operating Reserves, and Regulation Service on a least as-bid production cost basis over a two and half hour optimization period.**
  - Evaluates real-time offers and makes binding unit commitment and de-commitment decisions for the periods beginning 15 minutes (in the case of resources that can respond in ten minutes) and 30 minutes (in the case of resources that can respond in thirty minutes) after each RTC run
  - Produces binding schedules for external transactions; and
  - Provides advisory commitment information for the remainder of its optimization period
- **Each RTC run considers:**
  - SCUC's resource commitment for the day;
  - Load and loss forecasts for each quarter hour in its optimization timeframe;
  - Binding transmission constraints;
  - External transactions; and
  - All real-time offers and offer parameters by Generators that are able to start within 30 minutes.

**See section 3 (NYISO Market Mechanics) of the Market Participants User's Guide for more details*

Real-Time Dispatch

- **The NYISO's RTD software is a multi-period, security constrained dispatch model that co-optimizes to solve simultaneously for load, operating reserves, and regulation service, and to minimize the total cost of production over its nominal optimization period of one hour.**
  - Dispatches Generators, BTM:NG Resources and Demand Side Resources on a 5-minute basis;
  - Calculates real-time market clearing prices for energy, operating reserves, and regulation service, and establishes real-time schedules for those products on a five-minute basis
- **RTD does not consider start-up costs in any of its dispatching.**
- **In addition to producing a binding schedule for the next five minutes, each RTD run produces advisory schedules for the remaining four 15-minute periods of its bid-optimization horizon.**

**See section 3 (NYISO Market Mechanics) of the Market Participants User's Guide for more details*

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Next Steps

- NYISO and the utilities continue to discuss coordination and operational procedures for aggregation mapping to the transmission network
- Begin the Meter Data Study
  - Anticipated results in later this year
- Continue to develop Measurement & Verification/Monitoring & Control concept
- Continue reviewing Performance Obligations concept

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Feedback?

- To ensure all feedback is captured please email additional feedback to: DER_Feedback@nyiso.com

Reminder – All comments received will be posted on the NYISO Demand Response Programs webpage

Appendix - Acronyms

- DER – Distributed Energy Resource
- DCE – DER Coordinator Entity
- DCEA – DCE Aggregation
- DSP – Distributed System Platform provider
- DR – Demand Response
- RT - Real-Time
- DA – Day-Ahead
- RTC – RT Commitment
- RTD – RT Dispatch
- DAM – DA Market
- RTM – RT Market

The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits 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 policy makers, stakeholders and investors in the power system

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