DER Measurement & Verification, Monitoring & Control, and Meter Data Study

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Purpose of Today's Meeting

- DER Overview
- Existing Meter Data Requirements Overview
- Meter Data Study
- Review questions related to
  - Measurement & Verification (M&V)
  - Monitoring & Control (M&C)

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

Roadmap Concepts

- **NYISO will develop the following concepts through the stakeholder process:**
  - Aggregations
  - Measurement and Verification
  - Performance Obligations
    - Real-Time Operational Requirements and Resource Obligations
    - Day-Ahead Operational Requirements and Resource Obligations
  - Eligibility Criteria and Performance Obligations
  - Simultaneous 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

Metering Terms

- **NYISO uses two different types of metering data for operations and settlements:**
  - Real-time telemetry for operations*– a meter value provided in real-time to NYISO operations for the purpose of resource performance monitoring;
    - Real-time Telemetry Update Interval – the rate at which the telemetry value is updated by the resource
    - Scan Interval – the rate (6 seconds) at which NYISO queries telemetry points
  - Revenue Grade Metering for settlements* – an after-the-fact hourly meter value provided to the NYISO to perform settlements
    - Revenue Grade Metering Interval – the rate at which the revenue metering records values

*See Control Center Requirements Manual (manual 21) and Revenue Metering Requirements Manual (manual 25)

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Metering Terms (cont'd)

- **Monitoring and Control refers to NYISO's real-time metering requirements**
  - Allows NYISO operations to view resource's output (monitoring) and to adjust basepoints to meet system needs (control)
- **Measurement and Verification refers to NYISO's after-the-fact revenue grade metering requirements**
  - Allows NYISO to calculate the resource's output (measurement) and verify its performance for settlement purposes (verification)

Existing Real-Time Telemetry and Revenue Grade Metering Requirements

- **NYISO monitors and dispatches resources to maintain reliability by keeping the ACE within NERC compliance**
  - ACE – Area Control Error – the difference between the actual and scheduled interchange with other Control Areas, adjusted for frequency bias
  - The ACE value is calculated by scanning telemetry points every six seconds
- **Generation and DSASP resources are required to have**
  - Real-time telemetered data that is scanned every 6 seconds
    - All entities communicating real-time telemetered data to the NYISO are required to have redundant communication paths in case of failure
  - Hourly revenue grade metering
- **SCR, EDRP and DADRP resources are not required to have telemetry since they are not dispatchable in real-time**
  - These resources are required to have appropriate metering for settlement purposes

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Future DER Requirements

- DCEA telemetry and revenue grade metering will be based off of existing requirements for Generators
- NYISO recognizes that DER may require different and/or additional telemetry and revenue grade metering rules and requirements
  - *e.g.*, potential sampling methodologies for small DER
- NYISO will be evaluating the applicability of existing requirements and identifying whether any additional requirements are needed through its meter data study project

Meter Data Study Objectives

- **Meter Data Study will:**
  - Investigate whether and what existing metering requirements should be applicable to DER
  - Identify DER metering and telemetry issues the NYISO should address
  - Propose potential DER metering criteria
- **NYISO will use the meter data study to inform DER Measurement & Verification and Monitoring & Control requirements**
- **NYISO has identified a number of questions for consideration in the meter data study on the following slides**

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Real-time Telemetry - Feedback

- NYISO has received feedback that requiring a 6-second real-time telemetry update interval may be a barrier to entry for DER
- To maintain reliability and NERC compliance, Generators are required to have 6-second real-time telemetry scan intervals
  - Operational situational awareness and operation decisions are made using 6 second data
    - 6-second real-time telemetry scan interval for all Generators allows the NYISO to review that data on the same time-basis
    - Also permits NYISO to adjust basepoints of regulation service providers on a 6-second basis
- DCEs are expected to meet this same requirement

Real-time Telemetry Data Communication

- **NYISO currently requires Generators to utilize a private communication network connection using Inter-Control Center Communications Protocol (ICCP)**
  - Is the public internet a suitable, secure, and reliable option for DCE communication to the ISO?
  - Should the NYISO consider alternative protocols for DER?
- **NYISO requires 10 seconds or less one-way latency for real-time telemetry for Generators**
  - DCEs are expected to meet this same requirement

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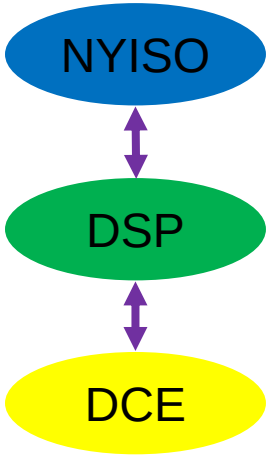
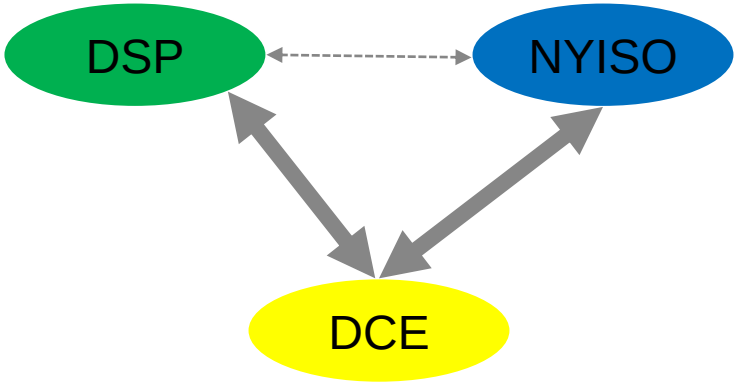
Real-time Telemetry Data Communication Paths

Option 1 – DCE communicates only with DSP and DSP provides data to/from NYISO



Option 2 – DCE communicates with both DSP and NYISO in parallel



Revenue/Telemetry Meter Data

- Does net-metering alone provide sufficiently accurate data on the performance of behind the meter resources (*e.g.,* on-site generation, storage, etc.)?
- NYISO expects the DCE's real-time telemetry data to be of the same quality as traditional Generators; what existing metering standards (NAESB, ANSI, etc.) should or must apply to DER and DCEs?
- What new and existing rules are required to ensure accuracy of the aggregated telemetry data from DCEs?
  - What new real-time data and calculations are needed to achieve this (e.g., real-time baselines)?
- What additional cybersecurity standards should be applied to the data exchange and communication infrastructure between ISO, DCE, DER and DSP/Utility?

Revenue Meter Certification

- **Utilities are the Meter Service Providers (MSPs) for all Generators**
  - MSPs install, certify, calibrate, and submit revenue meter data for Generators
  - Should the NYISO consider alternatives for DER?

Baselines

- **NYISO currently employs 4 types of baseline methodologies to calculate Demand Side Resource performance**
- **What baseline methodologies are needed to most effectively evaluate resource performance across all DER resource types, including the following**
  - Various load scenarios (*e.g.,* highly variable, steady, weather sensitive, small residential, etc.)
  - Frequent wholesale market dispatch
  - Injection vs injection and reduction vs reduction-only
  - Resource type (*e.g.,* storage, generation, curtailable load)
  - Time-granularity of baseline methodologies
  - Various market participation (*e.g.,* separate baselines for regulation, reserves, energy, capacity)
  - Methodology to determine upper limit for capacity when it is calculated from a baseline
  - Dual participation (wholesale and retail/end-customer use)

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Sampling

- **In the DER Roadmap NYISO stated that it would evaluate the use of sampling methodologies to reduce barriers to entry for small residential customers**
  - Is substituting sampling for real-time telemetry and /or settlements sufficient for small residential DER?
- **Specific areas of interest in statistical sampling methodologies are:**
  - What resource types, technologies and market services are suitable for sampling (*e.g.*, small residential only, no BTM generation, not regulation, etc.)?
  - Which sampling methodologies are most effective and suitable for DER?
  - How can NYISO develop a standard, pre-approved sampling methodology that reduces overhead required to create and review M&V plans on a case by case basis?

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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
- Begin reviewing Performance Obligations concept

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Feedback?

- Email additional feedback to: DER_Feedback@nyiso.com

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

Appendix

- DER – Distributed Energy Resource
- DCE – DER Coordinator Entity
- DCEA – DCE Aggregation
- DSP – Distributed System Platform provider

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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