DER & NYISO's Real-Time Telemetry Needs

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One of NYISO's responsibilities is maintaining the reliability of the New York Bulk Power System. Real-time telemetry updated every 6 seconds provides essential two-way communication of operational data between wholesale market resources and NYISO. NYISO relies on real-time telemetry for situational awareness necessary to balance supply and demand within the New York Control Area, and to identify and respond to normal and abnormal conditions.

NYISO currently requires 6-second scan rate for telemetered data from all market resources participating in NYISO's Energy and Ancillary Services Markets for the following reasons:

- **Situational Awareness:** The first and foremost reason is for NYISO to maintain situational awareness of the New York Control Area (NYCA) power system, especially of market resources' operation during times of significant unexpected grid events or changes. System operators must have an accurate understanding of power system conditions at all times in order to make quick decisions and direct market resources as needed to maintain reliability.
- **Automatic Generation Control:** 6-second telemetry is necessary for NYISO's Automatic Generation Control (AGC) process to control market supply resources in order to maintain NYCA generation and load balance. NYISO's AGC process operates every 6 seconds and provides all market resources basepoints at their required operating level.
- **Reliability Compliance:** 6-second telemetry is necessary to meet mandatory bulk power system transmission operating reliability criteria, including criteria unique to New York State. Specifically, New York State Reliability Council Requirement D.1 for Mitigation of Major Emergencies requires that immediate corrective action must be taken to reduce the loading on a transmission facility to below its Short Term Emergency (STE) rating within five minutes to make sure that the transmission lines are not damaged or compromised.1 In order to meet the New York State Reliability Council Requirement, NYISO requires up-to-date market resource information – based on the 6-second telemetry – to develop optimal resource schedules, and quickly communicate back the required schedules to market resources using its Security-

[1] New York State Reliability Council, Reliability Rules & Compliance Manual – For Planning and Operating the New York State Power System, Version 41, September 8, 2017

Constrained Economic Dispatch (SCED) and AGC programs.

- **Emergency Response:** Even though NYISO's SCED nominally operates on a five-minute period, NYISO will use SCED at any time to immediately respond to unexpected system events. The most up-to-date market resource information – based on the 6-second telemetry – is needed to develop optimal market resource schedules, quickly communicate back those schedules to market resources through AGC, and confirm that market resources are responding as required. NYISO will dispatch any available market resource, including energy-only resources, as necessary to respond to reliability events and resolve them timely.

Aggregations of dispatchable DER providing Energy and/or Ancillary Services have similar impacts to grid operations as that of any other supply resource. Therefore, these resources need to be responsible for the same provisions of dispatch control and visibility to NYISO on an aggregate basis. A critical aspect of DER integration is the ability to instruct all available resources on dispatch control to address reliability events (e.g., NYISO will utilize resources with flexible energy dispatch to provide relief on an overloaded transmission circuit or for a unit loss). NYISO will rely on aggregations of dispatchable DER to satisfy the reliability requirements of the New York State Reliability Council. Therefore, DER aggregations must be required to meet the same scan rate for telemetry as expected from other resources participating in NYISO's Energy and Ancillary Services Markets. Given that DER aggregations, including those with Demand Side Resources, will provide services comparable to generation for the purpose of real-time grid operations, DER aggregations will be required to have the same visibility as generation resources.

NYISO requires that the 6-second telemetry be communicated with NYISO at the DER aggregation level. The base point telemetry signal provided by the NYISO and the response telemetry signal required to be sent to NYISO will be at the aggregation level. The aggregation level telemetry signal provided to NYISO must reflect the response from all DER that comprise the aggregation within the 6-second time interval. It is expected that DER aggregators will install 6-second telemetry with individual DER resources in order to provide accurate 6-second telemetry to NYISO at the aggregation level.

NYISO has received feedback from DER aggregators that the cost of the existing 6-second telemetry requirements could be high and could be significant for smaller DER (e.g., residential customers) within an aggregation.

NYISO's evaluation has indicated that multiple cost effective technologies exist for providing 6-second scan rate for real-time telemetry and is not a cost barrier. The following considerations allow DER aggregators to use cost effective approaches to meet the 6-second telemetry requirements:

- NYISO's 6-second telemetry accuracy requirement to be within ±5% range is less stringent than the ±0.2% range required for settlement data. The less stringent accuracy requirement for telemetry as compared to settlement data allows the DER aggregators to use cost effective

approaches for telemetry.

- NYISO allows the DER aggregator the flexibility to use cost effective and innovative approaches for telemetry between the DER and the DER aggregator.
- There is a no significant cost difference between providing 6-second scan rate and 1-minute scan rate for telemetry.

NYISO's evaluation indicates that the 6-second telemetry between DER and DCE for a 0.25 MW DER could be met with a cost of $1 per MWh per month. This is based on the following: one-time metering device and installation cost of $600, optional one-time secure gateway and installation cost of $1000; existing broadband internet connection and router; one-time costs levelized over 5 years = $26.70/month; monthly maintenance cost for the metering device and secure gateway $20.00/month ➔ Total monthly costs = $46.70/month; based on 6 hour/day energy output = $1.00 per MWh per month.

In response to the feedback received from certain stakeholders, NYISO is proposing to allow alternative telemetry options (e.g., signal from thermostats) for smaller DER that are less than 100 kW (e.g., residential customers) that find it cost prohibitive to deploy traditional metering and telemetry solutions.

For reference, figure 1 summarizes the DER telemetry requirements at other ISOs/RTOs. It is to be noted that the DER telemetry requirements at CAISO and PJM are identical to that of the traditional generators.

Figure 1: DER telemetry requirements at other ISOs/RTOs

Unless otherwise specified, DER telemetry requirements are the same as traditional generator telemetry requirements

	NYISO Proposal	CAISO (Approved by FERC)	PJM Proposal	ISO-NE (Approved by FERC)
Energy	**6 seconds** (Alternate telemetry options for small DER)	**4 seconds** (for >= 10 MW applies to all resources)	**10 seconds** (for >10 MW or >1 MW & connected at >34 kV)	**5 minutes** (**4 seconds** for traditional generators)
Operating Reserves and Regulation	**6 seconds**	**4 seconds**	**10 seconds**	<= **1 minute** for reserves; **4 seconds** for Regulation (4 seconds for traditional generators)
Reference	See page 22-24	See page 16	See Slide 2; See section 4.2.2	See Slide 24