

DER Participation Model – Group 1 Concepts & Draft Manual Language

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Agenda

- **Background & Overview**
- **Key Concepts for Discussion**
- **Draft Manual Language for Discussion**
- **Grid Operations Coordination Portal Overview**
- **Enrollment Solution Overview**
- **Next Steps**

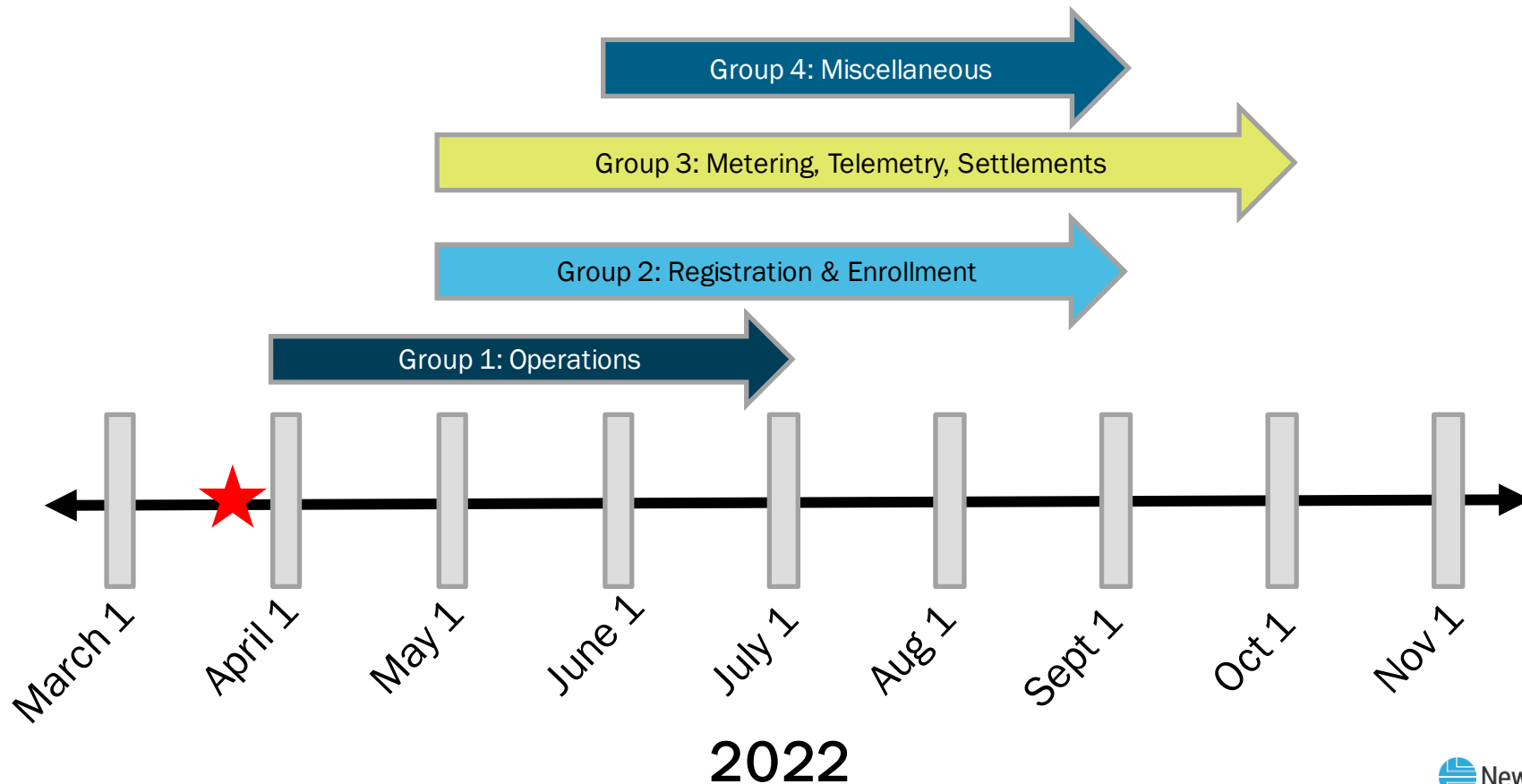
Background & Overview

- To support the deployment of the DER Participation Model, NYISO seeks stakeholder feedback of key concepts that will be included in NYISO Manuals, Guides, & Technical Bulletins.
- At the February 24, 2022, ICAPWG/MIWG, NYISO shared the high-level timeline and anticipated scope of updates for the full suite of documents.
- Before NYISO seeks approval of draft manual language, stakeholder input on the concepts must be solicited and captured in the documents by staff.

Background & Overview

- Today's discussion will review the concepts pertaining to reliable operation of the bulk electric system and distribution systems in the NYCA, including the coordination that is necessary among the NYISO, Transmission Owners, Distribution Utilities, and Aggregators.
- Concepts are presented first, followed by draft manual language for stakeholder consideration.
 - Please note: Concepts discussed in existing NYISO documents remain generally applicable to Resources other than Aggregations – this discussion focuses on concepts that also apply to Aggregations.

Timeline Discussion



Summary of Progress – Group 1: Operations

Document	Progress	Anticipated Working Group
Aggregation Manual Part I	Stakeholder review	3/25 ICAPWG
Emergency Operations Manual	Stakeholder review	3/25 ICAPWG
Transmission & Dispatch Operations Manual	Stakeholder review	3/25 ICAPWG
Day Ahead Scheduling Manual	Stakeholder review	3/25 ICAPWG
Ancillary Services Manual	Internal review	4/6 ICAPWG
Control Center Requirements Manual	Internal review	4/7 SOAS & CDAS
Outage Scheduling Manual	Internal review	5/3 ICAPWG
Outage Scheduler User's Guide	Internal review	5/3 ICAPWG
GOCP User's Guide	Internal review	5/3 ICAPWG

Approach to Manuals (Based on feedback received at 2/24 ICAPWG)

- **NYISO will post redlined documents prior to working groups – ‘Under Review’**
- **Documents will be discussed at working groups until a general consensus is reached.**
- **To the extent that additional updates are necessary, the current redlined draft will be posted for full visibility.**
- **All updates will be tracked and visible in the manuals portion of the NYISO website – NYISO will summarize all updates for a collective BIC/OC vote in November.**
 - The specific location is being added to the website and will be specified in a future discussion.
 - This allows the changes to become effective when the NYISO has greater certainty of the deployment date.

Key Concepts for Discussion

Operational Coordination

- **NYISO, Transmission Owners and Distribution System Operators require defined coordination practices to reliably schedule and dispatch Aggregations.**
- **New coordination practices will supplement, not replace, existing procedures where appropriate (*e.g.*, Submission of Bids/Offers to NYISO market systems).**
- **Day-Ahead & Real Time Communication needed to and from Aggregations:**
 - Planned distribution system maintenance (prior to close of the Day-Ahead Market and in real-time)
 - Planned transmission system maintenance (consistent with current procedures)
 - Day-Ahead Market Bids from Aggregator to NYISO
 - NYISO Day-Ahead Operating Plan to the Transmission Owner
 - An Aggregation's Day-Ahead Operating Plan (*i.e.*, the individual DER dispatch the Aggregator intends to dispatch to meet its schedule) from Aggregator to Distribution Utility
 - Distribution Utility review of individual DER schedules, and notification (if necessary) from the Distribution Utility to the Aggregator that a particular DER(s) should be adjusted due to distribution system conditions
 - Emerging distribution/transmission system conditions (actual or anticipated)
 - Forced/planned Generator/DER outages
 - Real-Time Market Bids from Aggregator to NYISO
 - Real-Time Dispatch instructions from NYISO to Aggregator
 - Supplemental Resource Availability for distribution/transmission system reliability

Operational Coordination Roles

■ Roles & Responsibilities:

- Distribution Utility and NYISO:
 - Notify each other as necessary for NYISO to initiate a Supplemental Resource Availability (“SRA”) for reliability purposes that impact the dispatch of individual DER.
 - Requests will be communicated via the NYISO Grid Operations Coordination Portal (GOCP)
 - ‘SRA’ refers to an action taken by system operators that is similar to a Supplemental Resource Evaluation (“SRE”) – SRA allows operators to make dispatch-only resource capability available for a specified duration at a given time, without using commitment
 - SRA requests must be submitted to NYISO for initiation – a DU request must be submitted via the applicable TO for NYISO evaluation and approval
 - All Distribution Utilities must be available for real-time operation verbal communication twenty-four hours a day, seven days a week, to maintain distribution system safety and reliability.
- Aggregator and NYISO:
 - Aggregator will be responsible for submitting offers to the NYISO market software reflective of composite Aggregation capabilities and performance, report outages of Aggregations to NYISO market applications and receive/respond to NYISO dispatch signals.
 - If an Aggregation is dispatched under the NYISO’s SRA rules, the Aggregator will receive an updated schedule and dispatch instructions from the NYISO to reflect the SRA.

Operational Coordination Roles

■ Roles & Responsibilities

- Distribution Utility and Aggregator:
 - Report emerging distribution system issues (e.g., feeder reconfigurations) to the Aggregator as soon as practicable. These issues may include the need for individual DER derates or full outages. All operating information will be shared with the Distribution Utility control centers and Transmission Owner control centers.
 - The Distribution Utility may direct the DER and/or Aggregator to curtail or disconnect any individual DER that creates or exacerbates distribution system issues to preserve reliability and safety.
 - All curtailments will be communicated to the Aggregator and NYISO as soon as practical. The Aggregator may plan to operate separate DERs to meet its NYISO schedule and modify its operating plan to reflect such decisions, for Distribution Utility visibility.
 - All metering and telemetry must be provided to the Distribution Utility (via the applicable Transmission Owner) consistent with the NYISO's requirements and the Aggregator must promptly notify the Distribution Utility when the operating status of its DER changes (e.g., that a unit is unavailable or can return to service).
 - All Aggregators must be available for real-time operation verbal communication twenty-four hours a day, seven days a week, to maintain distribution system safety and reliability.

Operational Coordination Roles cont'd

■ Roles & Responsibilities:

- Distribution Utility and Transmission Owner:
 - All operating data, including telemetry and revenue grade metering data, that is received by the Transmission Owner from NYISO for any Aggregation must be shared with the applicable Distribution Utility with the exception of TO-proprietary and confidential information such as the NYISO-issued Day-Ahead Operating Plan.
 - Data may include but is not limited to: NYISO DAM schedules and/or NYISO dispatch signals for multiple wholesale resources.
 - All operating data, including telemetry and revenue grade metering data, that is received by the Distribution Utility from the Aggregator for any Aggregation must be provided to the applicable Transmission Owner in order to communicate such information to the NYISO (e.g., Real-Time dispatch telemetry).
 - If the Distribution Utility determines one or more DER in an Aggregation must be derated in full or in part to maintain the reliability and safety of its distribution system security, the Distribution Utility will notify the TO, who will in turn notify the NYISO.

Operational Coordination Roles cont'd

■ Roles & Responsibilities

- Transmission Owner and Aggregator:
 - The Transmission Owner will report emerging transmission system issues to affected Aggregators as soon as practicable.
 - Transmission system issues may require full or partial derates of individual DER.
 - The Transmission Owner may direct the DER and Aggregator to curtail or disconnect any individual DER that creates or exacerbates transmission system issues to preserve reliability and safety.
 - All metering and telemetry must be provided to the Transmission Owner consistent with the NYISO's requirements and the Aggregator must promptly notify the Transmission Owner when the operating status of its DER changes (e.g., that a unit is unavailable, or can return to service).
 - All curtailments to preserve transmission system safety will be communicated to the Aggregator and NYISO as soon as practical. The Aggregator may plan to operate separate DERs to meet its NYISO schedule and modify its operating plan to reflect such decisions, for Transmission Owner visibility.

Operational Coordination Roles cont'd

■ Roles & Responsibilities

- Transmission Owner and NYISO:
 - When an Aggregation communicates to the NYISO and TO in parallel, telemetry to and from Aggregations must be sent simultaneously to/from the TO and NYISO. These processes are further detailed in the NYISO Direct Communications Manual and NYISO Direct Communications Procedure, and the Control Center Requirements Manual.
 - Real-time communications regarding Aggregation participation in the wholesale market shall be communicated between the Transmission Owner's designated operating desk and the NYISO control room.
 - The Transmission Owner and NYISO shall notify each other as necessary to initiate a Supplemental Resource Availability (SRA) for reliability purposes.
 - If a curtailment of an Aggregation by the Transmission Owner becomes necessary to maintain transmission system security, the Transmission Owner shall notify the NYISO by phone, or other agreed upon means.
 - All Transmission Owners must be available for real-time operation verbal communication twenty-four hours a day, seven days a week, to maintain transmission system safety and reliability.

Operational Coordination Timeline

■ Coordination shall occur as follows:

- Until 3:00 PM Two Days Before Dispatch:
 - The Distribution Utility and/or Transmission owner shall notify the Aggregator (and individual DER if necessary) of planned distribution and/or transmission system maintenance that may impact operations. This information will allow the Aggregator to Bid in a manner consistent with distribution and transmission system conditions.
- Up to 14 Days Prior and Until 5:00 AM on the Day Before Dispatch
 - Aggregator may submit and update Day-Ahead Market Bids through the NYISO's Market Information System.
- By 11:00 AM on the Day Before Dispatch
 - NYISO will provide Aggregators with Day-Ahead Schedules for its Aggregation(s). Per existing processes, the NYISO shall also provide each Transmission Owner with its Day-Ahead Operating Plan. Upon receipt of the Day-Ahead Operating Plan, the Transmission Owner shall communicate with the NYISO to re-dispatch Aggregations as necessary.

Operational Coordination Timeline cont'd

■ Coordination shall occur as follows:

- By 12:00 PM on the Day Before Dispatch
 - An Aggregator shall communicate the schedules of the individual DER it intends to dispatch to meet its Day-Ahead Market Schedule to the Distribution Utility. The Distribution Utility will use this information to verify that the Aggregator's dispatch plan reflects applicable distribution system conditions. The Aggregator must include (i) the applicable Transmission Node, (ii) feeder used for each DER, (iii) unique identifier (e.g., utility account number and meter number) for each DER being dispatched, (iv) minimum and maximum operating limits for each DER being dispatched, and (v) the timing of the dispatch. For additional information on this process, the applicable Utility should be consulted.
- After 12:00 PM and No Later than 10:00 PM on the Day Before Dispatch
 - Distribution Utility may review each Aggregator's submitted dispatch plan. If the Distribution Utility determines an Aggregator's planned dispatch is inconsistent with distribution system conditions, the Distribution Utility shall advise the Aggregator as soon as practical. If the Distribution Utility requires the Aggregator to modify its dispatch plan, the Aggregator may need to notify the NYISO of a de-rate and submit Real-Time Market Bids that account for the changed condition.
- Day After Dispatch
 - The Aggregation's Meter Authority will send revenue meter data for each hour of the Dispatch Day to the NYISO, according to existing NYISO processes described in the NYISO's Revenue Metering Requirements Manual.

Emergency Operations Concepts

- Aggregations are subject to all relevant emergency operation requirements that apply to conventional generators today, unless otherwise noted.
- Potential loss of Aggregations resulting in adverse impacts to reliability shall be included in the NYISO definition of an ‘Emergency’.
- NYISO and TOs will coordinate on reliable dispatch of Aggregations & DER.
- Aggregations shall be required to respond to reserve pickup signals.
- Aggregation capability must be made available in case of reserve deficiencies.
- Aggregations containing DER subject to emissions compliance are relieved of restrictions in the event of a Major Emergency.

Emergency Operations Concepts cont'd

- During periods of NYCA overgeneration, NYISO may request Aggregations to voluntarily operate below minimum dispatch levels.
- Aggregations shall be considered in energy transfer scheduling during a Restoration State.
- Aggregators shall follow existing procedures applicable to Generator Operators during a Restoration State.
- Aggregations shall be considered during assessment of line conditions when reestablishing interconnections.
- The Security Constrained Unit Commitment (SCUC) shall include Aggregations.
- NYISO shall be responsible for the dispatch of Aggregations, coordinating with the applicable TO when necessary.
- Aggregations shall be included in data sharing requirements and notification protocols of Interim Control Operations.

Transmission & Dispatch Concepts

- Aggregations are subject to all relevant transmission & dispatch operational requirements that apply to conventional generators today, unless otherwise noted.
- NYISO and TOs will coordinate on reliable dispatch of Aggregations & DER.
- Generator Operator requirements for NYISO and TO operational communication shall also apply to Aggregators.
- Aggregation output may be adjusted by NYISO to address system conditions.
- Aggregation telemetry shall be received by the applicable TO.
- Aggregations, based on qualifications, are required to respond accordingly during Reserve Activation.
- Aggregations shall be considered in the definition of Normal Transfer Criteria and Emergency Transfer Criteria.
- Aggregation full and partial derates shall be entered into the Grid Operations Coordination Portal (GOCP).
- In coordination with NYISO, Transmission Owners will control and coordinate Aggregations when appropriate during Response to Normal State conditions.
- NYISO shall include Aggregations in communication of NYCA operating conditions, including Aggregation schedules during the peak hour, and losses.

Transmission & Dispatch Concepts cont'd

- Aggregation dispatch shall not curtail Firm Transmission Service if applicable.
- Aggregation re-dispatch shall be included in Security Violation Relief protocols.
- Aggregation output may be adjusted to address system conditions.
- Existing rules applicable to dual participating facilities shall be extended to Aggregations containing facilities engaged in Dual Participation.
- Aggregations are subject to bid mode logic between Day-Ahead and Real-Time.
- Aggregations shall not be permitted to submit separate Operating Reserves Availability bids in real-time.
- Operational requirements applicable to Energy Storage Resources shall extend to Aggregations comprising only Energy Storage Resources.

Transmission & Dispatch Concepts

cont'd

- Aggregations shall be subject to existing qualification requirements to establish 15-minute scheduling.
- Aggregations shall be incorporated in Real-Time Commitment and Dispatch functions (including RTD-CAM).
- Operational requirements applicable to LESRs shall extend to Aggregations comprising only LESRs.
- Loss of Aggregations shall be considered in evaluating the need for a reserve pickup.
- Aggregations may be required to operate for Out-of-Merit reliability needs from the NYISO, TO, or Aggregator.
- DMNC scheduling details shall extend to Aggregators seeking to schedule DMNC tests for Aggregations.
- The NYISO and TOs/DSOs may submit a Supplemental Resource Availability (SRA) request via the GOCP to request aggregation capacity for specific period of time to address reliability issues.
- Reserve calculations and availability shall include Aggregations when applicable.

Day-Ahead Scheduling Concepts

- NYISO bid/post, scheduling, and automated mitigation systems shall incorporate Aggregation bids.
- The GOCP shall be incorporated into the NYISO scheduling data flow.
- SCUC shall consider energy level constraints for Aggregations comprising only ESRs.
- Automatic Generation Control (AGC) shall include the online status of Aggregations.
- Transmission Node LBMPs shall be posted following the existing procedures for posting bus and zonal LBMPs.
- Certain Must Run scheduling practices apply to Aggregations.
- Aggregations may contribute to Regulation and Reserves if eligible and available to do so.
- Aggregation maintenance shall be considered in reliability assessments for planning purposes.
- Loss calculation logic applicable to conventional generators shall extend to Aggregations.

Draft Manual Language for Discussion

Aggregation Manual Part I

- **1. Background & Overview**
 - 1.1 Demand Side Resource Participation in NYISO Markets
- **2. Operational Coordination**
 - 2.1. Operating Data Exchange
 - 2.2. Roles & Responsibilities
 - 2.3. Coordination Timeline
- **3. Transmission Nodes**
 - 3.1. Identification
 - 3.2. Transmission Node Changes
 - 3.3. Facility Designation to a Transmission Node
 - 3.4. Aggregator Responsibilities

Emergency Operations Manual

- 1.1. Operating Policy
- 1.2.2. Operating Objectives
- 1.2.3. Resources Response During Reserve Activation
- 4.4.3. Shortage Operating Reserve – Real Time
- 4.4.4. Shortage of Meeting Load
- 4.7. Overgeneration
- 6.3. Responses to the Restoration State
- 6.4. Criteria and Conditions for Reestablishing Interconnections
- 8.3. Security Constrained Unit Commitment
- 8.4.4. Transmission Owner Dispatching Guidelines
- 8.5. Data & Implementation Requirements
- A.7.4. Applicable Contingencies

Transmission & Dispatch Operations Manual

- 2.1.2. NYISO Objective
- 2.2. NYISO, Transmission Owner, Generator Owner and Aggregator Responsibilities and Authorities
- 2.5.4. Energy Market Functions
- 3.1.6. Response to Normal State Conditions
- 3.1.9. Communication of New York Control Area Operating Conditions
- 4.1.2. Corrective Control Strategies
- 4.1.3. Transmission Service Reduction and Curtailment
- 4.2.8. Security Violation Relief
- 4.2.9. Operating Under Adverse Conditions
- 5. Process for Determining Facilities Secured in the Market Models

Transmission & Dispatch Operations

Manual cont'd

- 6.1.1. Real-Time Commitment Process
- 6.7. Scheduling Operations Procedures
 - 6.7.4. Out-of-Merit Generation
 - 6.7.5. Generator DMNC Test Scheduling Requirements
 - 6.7.6. Rules for Generators Conducting Certain Scheduled Steady-State Tests
 - 6.7.7. General Rules
 - 6.7.17. Supplemental Resource Availability (SRA)
- 7.1.1. Real-Time Dispatch Process
- 7.2. Real-Time Dispatch – Corrective Action Modes
- 7.3. RTC/RTD Solution Process

Day-Ahead Scheduling Manual

- 2.1. System Components
- 2.3. Day-Ahead Functional Components
- 3.2. Bid/Post Process
- 3.3.8. GOCP
- 4.1. Day-Ahead Inputs & Outputs
- 4.2.3. Initial Generator Status and Commitment Rules
- 4.2.4. Scheduling a “Must Run” Resource
- 4.3. Security Constrained Unit Commitment
- 4.5. Energy Storage and Aggregations Containing ESRs only Constraint Evaluation
- 8.4. Reliability Assessment Process
- Attachment A Calculation of Incremental Losses
- Attachment B NYISO Load Forecasting Model

NYISO Grid Operations Coordination Portal Overview

GOCP Basic Functions

- **The GOCP serves two basic functions:**
 1. Handling of Aggregation level outage requests and derates
 2. Handling of Aggregation level Supplemental Resource Availability (SRA) requests
- **The GOCP will be utilized by the NYISO, Aggregators, and Transmission Owner Control Centers, and will otherwise be non-public**
 - References to the TO used in this section refer to control center operations.

Aggregation Outage Request Handling

- **The GOCP will allow Aggregators to submit forced and planned outage notifications/requests to the NYISO for their Aggregations**
- **Outage notifications and requests can only be made at the Aggregation level and are represented as derates of the Aggregation**
 - Aggregations will be modeled as connected at transmission nodes and can't be disconnected directly
 - Individual facility outages will be reflected as a derate of the Aggregation to which they belong
- **The GOCP will provide the capability to automatically approve outage requests**

Aggregation Outage Request Handling (Cont.)

- The GOCP will automatically create Out-of-Merit (OOM) records and pass them to the MIS/OOM Package where the request is approved by NYISO Operations
- Aggregators will need to modify related bids in the MIS independently of the records entered in the GOCP
- Approved outage requests will be passed to downstream systems as required
- The GOCP will post the status of the requests and notify the Aggregator of a change of status

SRA Request Handling

- **The GOCP will allow TOs to submit Supplemental Resource Availability (SRA) requests to the NYISO for local reliability**
 - The NYISO Operators can also submit these requests
 - Distribution System Operators (DSOs) can also submit these requests but will need to do it through the TO.
 - These requests will be for Aggregations and not for individual resources
 - A SRA requests that a specified Aggregation has a specified amount of available capacity at a specified time for a specified duration.
- **The GOCP will provide the capability to automatically approve these requests for processing**

SRA Request Handling (Cont.)

- The GOCP will automatically create OOM records and pass them to the MIS/OOM Package where the request is approved by NYISO Operations
- The GOCP will post the status of the request and notify the TO and Aggregator when the status changes
- The evaluation of these requests by the NYISO requires that there are valid bids in the MIS

GOCP Reports

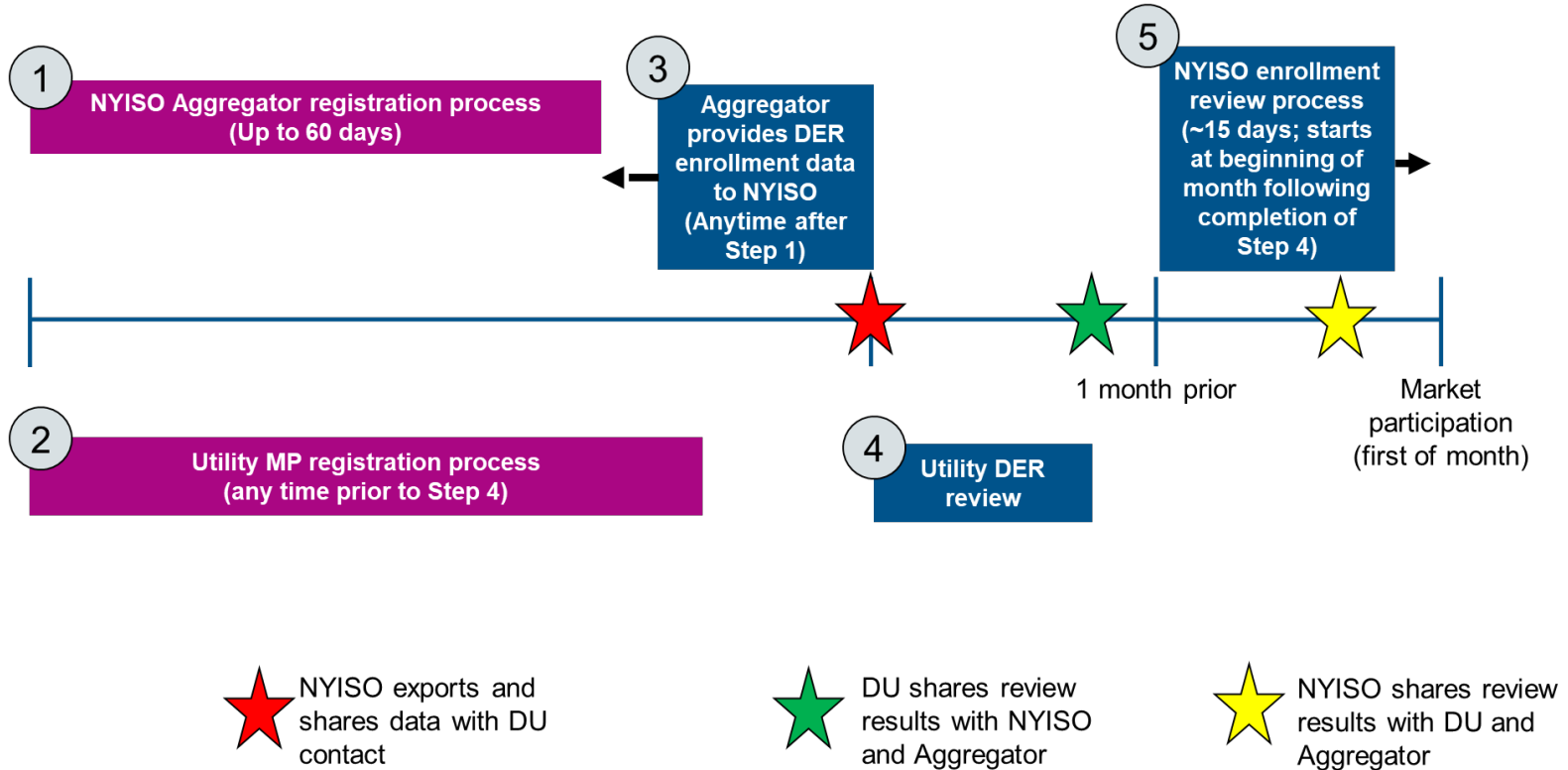
- **The GOCP will allow TOs and Aggregators to query outages and SRA requests to generate reports**
- **Aggregation-specific information should only be accessible to the relevant Aggregator, relevant TO control centers and the NYISO**
- **The GOCP will support different types of outage codes to allow identification of transmission system outage, distribution system outage or DER facility outage**

Enrollment Solution Overview

Enrollment – DER and Aggregations

- **NYISO will not implement the enrollment requirements, or any requirements, associated with the NYISO's compliance filing for FERC Order 2222.**
 - The NYISO will consider developing requirements, as needed, to comply with FERC Order 2222 once a final ruling is received.
 - NYISO will continue to pursue a distribution utility review process that supports the NYISO's 2019 FERC-approved market design and does not contain features unique to the requirements of Order 2222 (E.g., 60-day timer).
- **NYISO will implement a framework for enrollment of DER in Aggregations that enables a utility review for reliability and safety of the distribution system to occur, consistent with the 2019 DER filing and associated discussions with utilities and stakeholders.**
- **The purpose of the discussion is to review the concepts with stakeholders prior to manual language drafting.**

Registration and Enrollment Timeline – Example for Discussion Purposes Only



Next Steps

Next Steps

- **NYISO will return to discuss concepts and supporting language for Group 1 – Operations continued at an ICAPWG, CDAS, and SOAS in April.**
- **NYISO will post any subsequent revisions to redlined documents on the website.**
- **Please send any questions, comments, or feedback that were not addressed during this presentation to: DER_Feedback@nyiso.com**
 - Comments/feedback submitted to the NYISO will be posted publicly unless the NYISO is specifically asked not to do so.

Our Mission & Vision



Mission

Ensure power system reliability and competitive markets for New York in a clean energy future



Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation

Questions?