

Generating Availability Data System (GADS) as Used Under NYISO Rules

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WebEX Training

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Course Objectives

Attendees will:

- Learn the origin of the Generating Availability Data System (GADS) from NERC's perspective
- Understand NYISO's use of GADS data
- Name the three types of GADS data
- Identify the NYISO-required Design data fields
- Become familiar with the elements and layout of Event Records
- Distinguish between the different Unit States, Cause Codes, and Contribution Codes

Course Objectives

- Understand the process of Generator Outage Scheduling with the NYISO
- Become familiar with the elements and layout of Performance Records
- Recognize common reporting errors
- Understand NYISO's use of GADS data to calculate Derating factors (EFORd)
- Identify potential penalties/sanctions for noncompliance with GADS reporting to the NYISO
- Learn the process of entering/editing GADS data in NYISO's online GADS Portal

Note: Information provided regarding NERC rules and requirements is provided solely as an overview for background and context of NYISO requirements. The NYISO is not informing or advising attendees on obligations for NERC requirements or procedures

GADS- Introduction

GADS Origin

Generating Availability Data System

- **Objective of GADS: Compilation and maintenance of an accurate, dependable, and comprehensive database capable of monitoring the performance of electric generating units and pieces of equipment**
- **Established by NERC in 1982 to expand data collection activities begun in the 1970s.**
- **Uses IEEE Standard 762, “Definitions for Use In Reporting Electric Generating Unit Reliability, Availability and Productivity”**

GADS Overview

- General GADS information and the “GADS Data Reporting Instructions” (DRI) may be found at

<https://www.nerc.com/pa/RAPA/gads/Pages/Data%20Reporting%20Instructions.aspx>

- The GADS Data Reporting Instructions document details the procedures, format, and frequency to follow when reporting data to NERC

GADS Overview

- The three types of data reported:
 - Design
 - Identifies the unit as an unique entity
 - Event
 - Specific data for each unit event
 - Derating, Maintenance, Outage, Reserve Shutdowns
 - Performance
 - Summary of unit operation for a month

Differences between NERC and NYISO requirements

	NERC	NYISO
Submission requirement	Mandatory for 20 MW or larger conventional units effective 2013	Required for non-SCR ICAP suppliers
Data Submission	End of the month following the end of a quarter. Jan-Mar reported by 30Apr	Each month (YTD) reported by the 20th of the following month – Jan to April data – reported by May 20th
Data Required	All data defined in “GADS Data Reporting Instructions” sections III & IV (as mandatory)	In the NYISO ICAP Manual (Attachment K)
Data Formats	One format; decimal only	One format: decimal only (YTD data only)

NYISO & GADS

- **NYISO's use of GADS data**
 - NYISO and the New York State Reliability Council's (NYSRC) Reliability Studies
 - Installed Reserve Margin (IRM) determination for the New York Control Area (NYCA)
 - Calculation of Derating Factors (EFORd) for the Installed Capacity (ICAP) Market

Installed Reserve Margin (IRM)

- Capacity above firm system load, required to provide for equipment (forced and scheduled) outages and transmission capability limitations, expressed as a percentage
 - GADS reporting provides data about equipment outages
- Established annually by the NYS Reliability Council (NYSRC) for the upcoming Capability Year
- Based on the Northeast Power Coordinating Council (NPCC) Standard for Resource Adequacy
- Required for the calculation of the Installed Capacity needs of NY and to operate NYISO's capacity markets



Equivalent Forced Outage Rate demand (EFORd)

- The Services Tariff defines it as: “The portion of time a unit is in demand, but is unavailable due to forced outages”
 - GADS reporting provides data about unit outages and derates
- NYISO uses EFORd to calculate the UCAP (Unforced Capacity) of certain types of units
- Refers to the historical availability of a generating unit

NYISO & GADS

- **NYISO's Tariff and Regulatory Requirements**
 - NYISO Market Service Tariff 5.12.5
 - NYS Reliability Council Rule I-R2 & Requirement 2
 - NERC's Rules of Procedure Section 1600

NYISO GADS DESIGN DATA

- Identifies the unit as a unique entity**

Design Data

- Generators are required to submit this data to the NYISO (typically once), separate and distinct from what a generator may submit to NERC
- Design data required by the NYISO is a shorter list than that required by NERC

Design Data

- Utility (Company) Code (3-character)
- Unit Code (3-character; alpha-numeric)
- Unit Name & Abbreviation (Short Name)
- Maximum Net Capacities
- Commercial In-Service Date
- Service Hour Method

Unit Code Criteria

Unit Code

A unique ID assigned based on the following criteria

100 -1ZZ	Fossil (Steam) (Use 600-649 if additional numbers are needed)
200 – 2ZZ	Nuclear
300 – 3ZZ	Combustion Turbines (use 700-7ZZ if add'l numbers needed)
400 – 4ZZ	Diesel Engines
500 – 5ZZ	Hydro/Pumped Storage Units (use 900-9ZZ if add'l numbers needed)
650 – 6ZZ	Fluidized Bed Combustion Units
800 – 8ZZ	Misc (Multi-Boiler/Multi-Turbine, Geothermal, Combined Cycle, etc)

GADS EVENT DATA

- Data about each unit event**

NYISO Event Data

- Reported on at least two separate records
 - Record 01
 - Utility, Unit, Year, Event Number, Revision Code, Event Type
 - Start of Event (Date/Time), End of Event (Date/Time), Net Available Capacity
 - Record 02
 - Utility, Unit, Year, Event Number, Revision Code, Event Type
 - Cause Code & Event Contribution Code

Event Elements (Key Elements)

Record Code	07 for Event Data
Utility (Co.) Code	3-char. code from NERC GADS Data Reporting – App C
Unit Code	A unique ID (3-char.) assigned by the owner based on the criteria from NERC GADS Data Reporting – Appendix C
Year	4-digit year for the period reported
Event Number	Unique # assigned to each event, doesn't have to be sequential, but can't repeat in same year
Revision Code	1-digit code, (1-9) signals a correction, addition and (X) indicates deletion to previously reported data
Event Type	2 character code that best describes the event (inactive, outage, derating, reserve shutdown).
Record Number	Either 01 for first record or 02 for second; at end

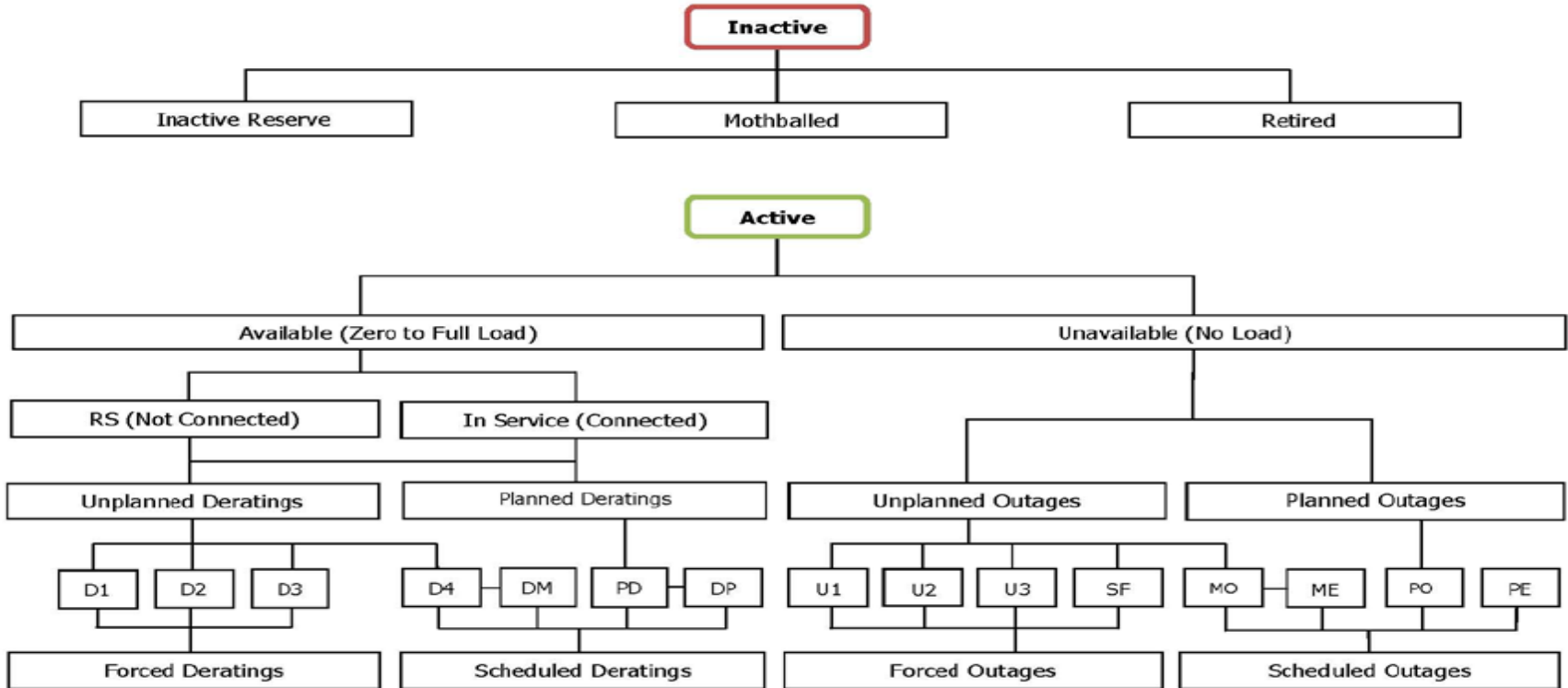
Event Elements Record 01

After Key Elements

Start of Event	Time (month/day/hour/minute) the event began	<ul style="list-style-type: none"> - 24-hour clock - Midnight reported as 0000 of next day - Beginning of day is 0000
End of Event	Time (month/day/hour/minute) the event ended	Events that span reporting period should have no end time until the event ends*
Net Available Capacity	Capacity available with derating	Only reported for derating events

* Events spanning years: Event will end on 12/31 of that year and will be reported for Dec, and a new event record will be started for 01/01 of the next year with a new Event Number

Unit States-Event Type



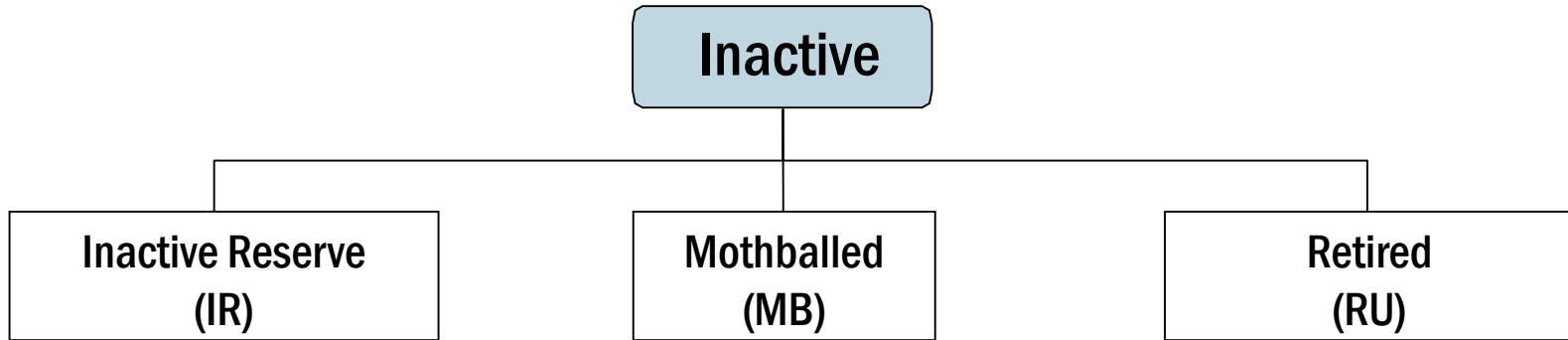
* NYISO only collects GADS data from Active Units

Unit State - Event Type

- Inactive States

- Active States
 - Unavailable (outages)
 - Available (deratings)

Unit State - Inactive



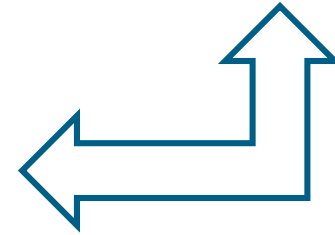
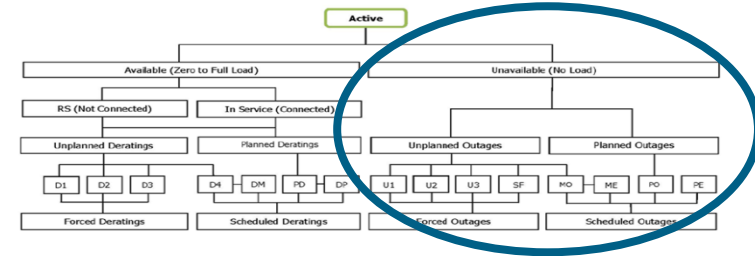
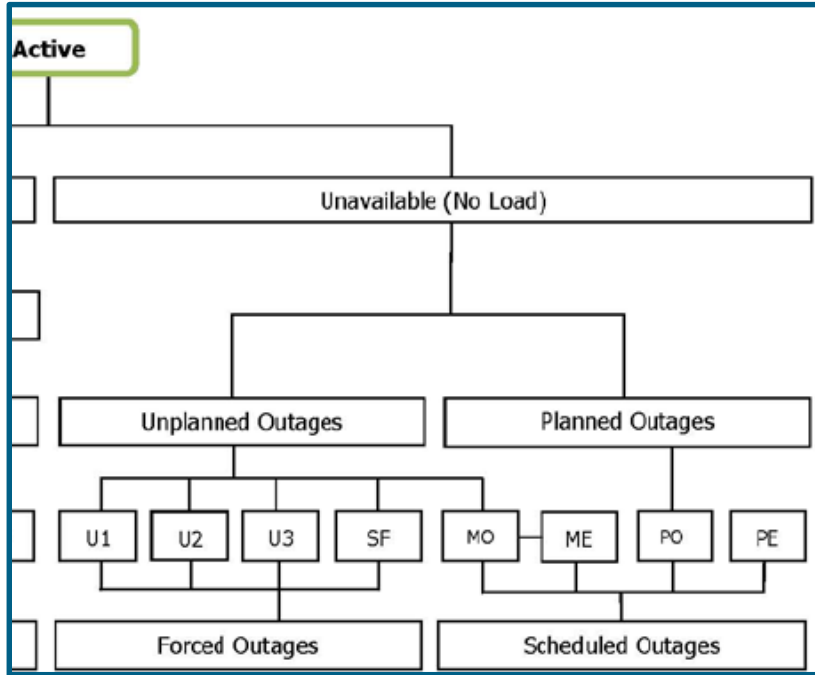
Units in any one of these states are not eligible to participate in the ICAP market, therefore NYISO does not require GADS data on units from this category

Inactive State

Inactive Reserve	IR	Unavailable but can be brought back quickly with repairs
Mothballed	MB	Unavailable but can be brought back in weeks or months with repairs
Retired	RU	Unit is unavailable and not expected to return to service in the future

*** See DRI Section III, page 5, for associated rules

Unit State – Active, Unavailable



Scheduled Outages

Planned Outage	PO	Scheduled well in advance, defined duration (weeks), once or twice /year
Maintenance Outage	MO	An outage <u>that received NYISO's approval (with minimum two days notice)</u> and there are no reliability issues if the unit is removed from service
Planned Outage Extension	PE	Extension of a PO for work that is in the original scope. Start date/time must match the original PO end date/time
Maintenance Outage Extension	ME	Extension of a MO for work that is in the original scope. Start date/time must match the original MO end date/time

*** See Services Tariff, OATT, and Outage Scheduling Manual for other outage reporting requirements. The requirements for GADS reporting may be different. NYISO Rules supersede NERC GADS rules

Forced Outages

Startup Failure	SF	Unit is unable to synchronize within a specified time following an outage or reserve shutdown
Unplanned (Forced) Outage - Immediate	U1	An outage that requires immediate removal of a unit from service, another outage state or reserve shutdown
Unplanned (Forced) Outage - Delayed	U2	An outage that does not require immediate removal of a unit from the in-service state but requires removal within six hours
Unplanned (Forced) Outage - Postponed	U3	An outage that can be postponed beyond six hours but requires that a unit be removed from the in-service state before the end of the next weekend

ICAP Ineligible Forced Outage – IIFO

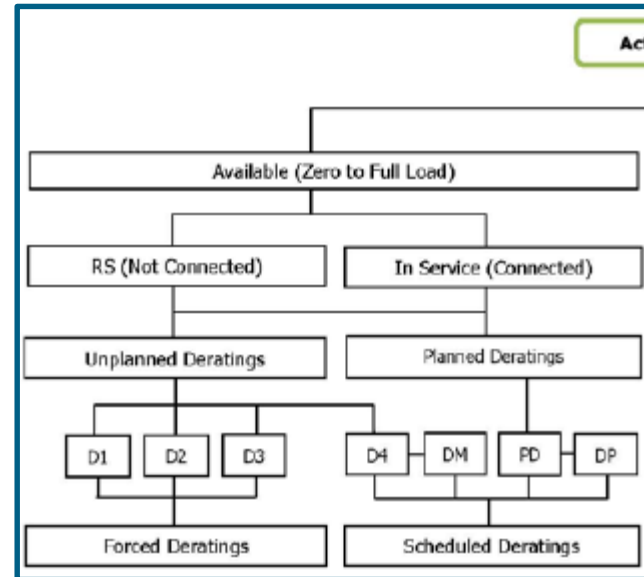
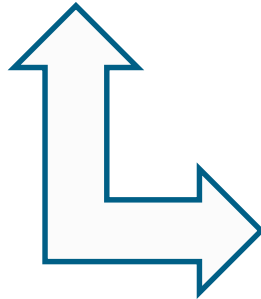
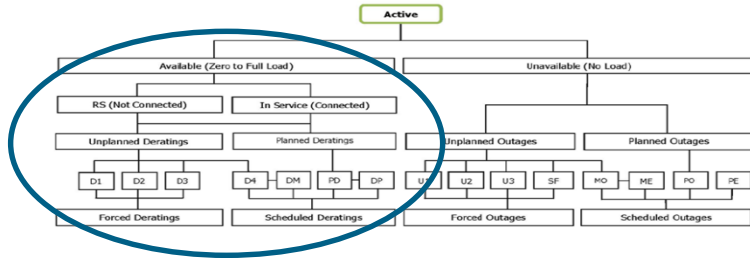
- A Generator on a Forced Outage (U1, U2, U3, SF) without a credible repair plan will be placed in an ICAP Ineligible Forced Outage (IIFO) on the first of the month following 180 days of being in a Forced Outage
- A Generator may voluntarily reclassify itself from a Forced Outage to an IIFO if the Generator has been in a Forced Outage for at least sixty (60) days
- A unit in an IIFO shall report its status as a Forced Outage in its GADS data provided to the NYISO

Miscellaneous States

Reserve Shutdown	RS	<p>Unit is available but not synchronized</p> <p>Maintenance work can be conducted while in this state as long as the maintenance does not prevent the unit from synchronizing within normal start-up time and reaching available capacity on demand</p>
Non-curtailing Event *	NC	<p>Unit component removed from service but does not require a unit outage or derating</p>
Pumping	PU	<p>In addition to recording Monthly Performance Pumping Hours, Pumping events are now required to be submitted (Cause code 9345)</p>
Synchronously Condensing	CO	<p>In addition to Monthly Performance Synchronously Condensing Hours, Synchronously Condensing events are now required to be submitted (Cause code 9340)</p>

* NYISO does not use or require these events

Unit State – Active, Available



Scheduled Deratings

Planned Derating	PD	Schedule well in advance for a predetermined duration
Maintenance Derating	D4	<u>Approved by NYISO</u> , and there are no reliability issues when the unit's output is reduced Flexible start time and does not require a predetermined duration
Maintenance Derating Extension	DM	Extension of a D4 for work within original scope and start date/time must match the original D4 end date/time
Planned Derating Extension	DP	Extension of a PD for work within original scope and Start date/time must match the original PD end date/time

***** Planned/maintenance deratings must be coordinated by NYISO Operations with at least 2 days notice from unit's owner/operator**

Forced Deratings

Unplanned (Forced) Derating – Immediate	D1	Event that requires an immediate reduction in capacity
Unplanned (Forced) Derating – Delayed	D2	Event that does not require immediate action, but requires a reduction in capacity within six hours
Unplanned (Forced) Derating – Postponed	D3	Event that can be postponed beyond six hrs, but requires a reduction in capacity before the end of the next weekend

Derating States

- Derate Events can overlap all other event types (RS, PO, FO, MO, etc.)
- A Derate Event does not indicate a generator's availability, but rather its output capability (Available Capacity)
- A Derate Event can last an entire year, e.g., a DEC Environmental Restriction (NO_x , SO_2)
- GADS assumes generator is In-Service when other events do not exist during the derate time period

Derating States

- A Derate Event is not reported when reduction is less than 3% of Net Maximum Capacity (NMC), and less than 15 minutes in duration
- Derates due to Ambient Conditions are not reported to GADS

Testing Following Outages

- **Periods of testing of equipment after outages need to be reported to GADS**
 - **On-line testing (synchronized)**
 - If unit is online and in service at a reduced load, following a planned, maintenance or forced outage, the testing is reported as a planned derating (PD), maintenance derating (D4), or unplanned forced derating (D1) respectively
 - **Off-line testing (not synchronized)**
 - If unit is not synchronized during testing, the testing period will be part of the outage event
 - Outage ends when the testing is complete, and the unit is placed in service or enters another state

NYISO Rules for Events and Extensions

- Any repairs, not part of the original scope of a scheduled event, that require an extension of the event, is considered a forced extension event for GADS submittal
- Ultimately, what is determined by the NYISO, concerning an event extension, whether it is forced or not, determines how the event is entered into the Market Participant's GADS data provided to the NYISO

Outage/Derating States and EFORd

Outages and Startup Failure	Impact on EFORd
Planned Outage PO	No
Maintenance Outage MO	No
Planned Outage Extension PE	No
Maintenance Outage Extension ME	No
Unplanned (Forced) Outage Immediate U1	Yes
Unplanned (Forced) Outage Delayed U2	Yes
Unplanned (Forced) Outage Postponed U3	Yes
Startup Failure SF	Yes

Derates	Impact on EFORd
Planned Derate PD	No
Maintenance Derate D4	No
Planned Derate Extension DP	No
Maintenance Derate Extension DM	No
Unplanned (Forced) Derate Immediate D1	Yes
Unplanned (Forced) Derate Delayed D2	Yes
Unplanned (Forced) Derate Postponed D3	Yes

Allowable State Transitions

TO FROM	U1	U2	U3	SF	MO	PO	ME	PE	RS	DM	DP
U1 – Immediate	Yes	No	No	Yes	Yes	Yes	No	No	Yes		
U2 – Delayed	Yes	No	No	Yes	Yes	Yes	No	No	Yes		
U3 – Postponed	Yes	No	No	Yes	Yes	Yes	No	No	Yes		
SF - Startup Failure	Yes	No	No	Yes	Yes	Yes	No	No	Yes		
MO – Maintenance	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes		
PO – Planned	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes		
ME – Maintenance Extension	Yes	No	No	Yes	Yes	Yes	No	No	Yes		
PE – Planned Extension	Yes	No	No	Yes	Yes	Yes	No	No	Yes		
RS – Reserve Shutdown	Yes	No	No	Yes	Yes	Yes	No	No	Yes		
D1 – Immediate	<i>IEEE Standard 762 does not recognize transition to/of deratings from/to other event types except as shown.</i>									No	No
D2 – Delayed										No	No
D3 – Postponed										No	No
D4 – Maintenance										Yes	No
PD – Planned										No	Yes
DM – Maintenance Derating Extension										No	No
DP – Planned Derating Extension										No	No

Figure III-3: Allowable Event Type Changes

From the GADS DRI, Section III Event Reporting

Events Spanning Periods

- **Event Number (required)**
 - Unique number assigned to a single event
 - One event number per outage/derating
 - Need not be sequential
 - An event that continues through multiple months keeps the originally assigned number

One Event for One Outage



Events Spanning Periods

- **Some data providers report a new event record for the same event if it goes from one month to the next**
 - There are no advantages of such actions to the GADS statistics
 - **Conversely:**
 - This action may distort the frequency calculation of outages
 - Increase the work load of the reporter by having them repeat reports
 - Increases the chances of errors in performance and event records
 - Hours of outage
 - Cause codes and Event types

Events Spanning Periods

How should events that span periods be reported?

- Two different ways:
 - Report an end date/time of the last day of reporting period and revise in later period when event actually ends
 - Report event without an end date/time. Report the end date/time after the event is finished. This is the preferred method of reporting to NYISO

NYISO Event Data-Record 02

- **Record 02**
 - Utility, Unit, Year, Event Number, Revision Code, Event Type
 - Cause Code & Event Contribution Code

- **Additional records**
 - Same format as Record 02 with incremental record number
 - Report of additional system/component cause codes
 - NYISO removes these records prior to input to its database

Event Elements (Key Elements)

Record Code	07 for Event Data
Utility (Co.) Code	3-char. code from NERC GADS Data Reporting – App C
Unit Code	A unique ID (3-char.) assigned by the owner based on the criteria from NERC GADS Data Reporting – Appendix C and next slide
Year	4-digit year for the period reported
Event Number	Unique # assigned to each event, doesn't have to be sequential, but can't repeat in same year
Revision Code	1-digit code, (1-9) signals a correction, addition and (X) indicates deletion to previously reported data
Event Type	2 character code that best describes the event (inactive, outage, derating, reserve shutdown)
Record Number	Either 01 for first record or 02 for second; at end

Event Elements - Record 02

System/Component Cause Code	Code that identifies the system, major component or piece of equipment involved in the event.	4-digit code listed in NERC GADS DRI App B*
Event Contribution Code	Code that describes <u>how</u> the component identified in Sys/Comp Cause Code contributed to the event.	1-digit code list on a following slide. NYISO only receives contribution code 1

* See also Section VI in the DRI for 2020 GADS Cause Code Changes

* Events spanning years should have the event end on the 12/31@24XX reported for Dec and create a new record reported for Jan starting the 01/01@00XX of the next year with a new Event Number

Cause Codes Guidelines

- When reporting an event, select the Cause Code from the proper unit type section
- The following criteria are to be used in selecting a Cause Code
 - Assign event cause to major component or system
 - Not to auxiliary component or operation that triggered the failure of the major component or system
 - See Appendix B of the NERC DRI
 - Cause Code Sections

Cause Codes Guidelines – Power Supply Issues

- **Single vs. Multiple Components**
 - Use Cause Code for component when power supply serves a single component
 - e.g., Motor control centers, breakers, etc.
 - Use Cause Code for power supply system when it serves multiple components
 - See example on next slide

Cause Codes Guidelines – Power Supply Issues

- For example:
 - If a breaker failure results in the loss of a Forced Draft fan, the Cause Code for the FD fan would be used (single)
 - If a problem in the AC power distribution caused not only the loss of the FD fan but also several other major components, then use the Cause Code for AC power distribution (multiple)

Cause Codes Guidelines

- **Report instruments or controls which are part of a particular fan, pump, or valve, using the Cause Code for that component**
 - Such as pressure switches, pressure regulators, position indicators, etc.

Cause Codes Guidelines – Control Systems New York ISO

■ Control Systems

- Cause codes have been assigned to some control systems, such as feed water control
 - Report all instruments, transmitters, logic modules, etc., associated with these systems using the Cause Code for that control system

Cause Codes Guidelines

- **Non-specific overhaul work**
 - OK to use the Cause Codes for major overhaul
- **Major repairs during a major overhaul**
 - To be reported separately using the appropriate specific Cause Code(s)

Cause Codes Guidelines

- Use “External”, “Safety, Regulatory, and Environmental” Cause Codes
 - Only when no other system/component Cause Code applies

- For example:
 - If stack emission limits are exceeded because of a fault in the flue gas scrubber, use a scrubber Cause Code

 - If a new limit on emissions is imposed and is exceeded even though the scrubber is functioning properly, then use an environmental code

Cause Code Guidelines – Cause Code 9300

- Cause Code 9300 is the only cause code, from among those that are otherwise listed as “Outside Management Control,” that does not expose the unit to EFORd degradation, for NYISO
- It is used when the unit is forced into an outage by an equipment failure that involves equipment located on the electrical network including and beyond the generator step-up transformer
- In the GADS data submittal to the NYISO, the outage/derate event (U1, U2, U3, D1, D2, or D3) must be coded with the 9300 cause code (transmission system problems other than catastrophes)
 - See NYISO Installed Capacity Manual section 4.6.2

Plant Boundaries

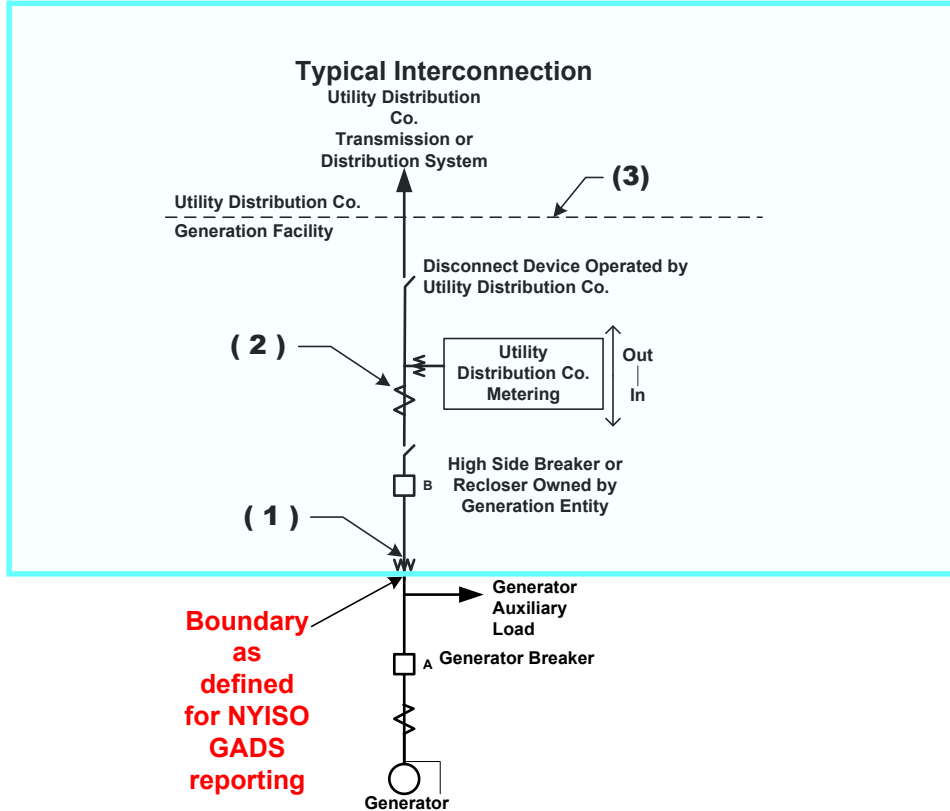
At what location on the electric network does the NYISO consider an electric equipment failure to be Outside of Management Control?

Plant Boundaries

- **NYISO Definition – Generator Owner responsibility ends at the low side bushings of the generator step-up (GSU) transformer**

- **NERC statement of entities with reporting responsibilities (DRI Pg I-2)**
 - **Generating Companies-GENCO**
 - **Transmission Companies-TRANSCO**
 - **Distribution Companies-DISCO**

Plant Boundaries



NYISO defines events associated with equipment in the shaded area to be an Outside Management Control “9300” event

(Image credited to IEEE 762, Annex D)

Event Elements – Record 02

<u>Event Contribution Code</u>	
1	Primary cause of event
2	Contributed to primary cause of event
3	Work done during the event – Identify components worked on during an event that did not contribute to the event
5	After startup, delayed unit from reaching load point

NYISO Rules for Events and Extensions

- Any repairs, not part of the original scope of a scheduled event, that require an extension of the event, is considered a forced extension event for GADS submittal
- Ultimately, what is determined by the NYISO, concerning an event extension, whether it is forced or not, determines how the event is entered into the Market Participant's GADS data provided to the NYISO

Generator Outage Scheduling with the NYISO

Generator Outage Scheduling

- **Generator Outage Scheduling Defined**
 - All Generators located in the NYCA or supplying ICAP to the NYCA must submit a confidential notification of their proposed outage schedule to the NYISO

- **Generator Outage Basis for Coordination**
 - Limit “Severity of Impact,” Maintain NYS Reliability, compliance with reliability rules
 - Outages reduce ability to contribute to reliable operation of interconnected system

Outage Scheduling Process

- **Annual Maintenance Submittals**
 - Generator Owners Submit Confidential Requirements, which include:
 - Current Year plus Two-Year Schedule of Annual Scheduled Outages
 - Submitted to NYISO by September 1st

- **Submittal Process: Two Year Projection**
 - Manual Submittal (E-Mail, Telephone, iTOA entry)
 - CSV Upload
 - Updates to these projections such as cancellation of scheduled outage must include justification

Outage Scheduling Process

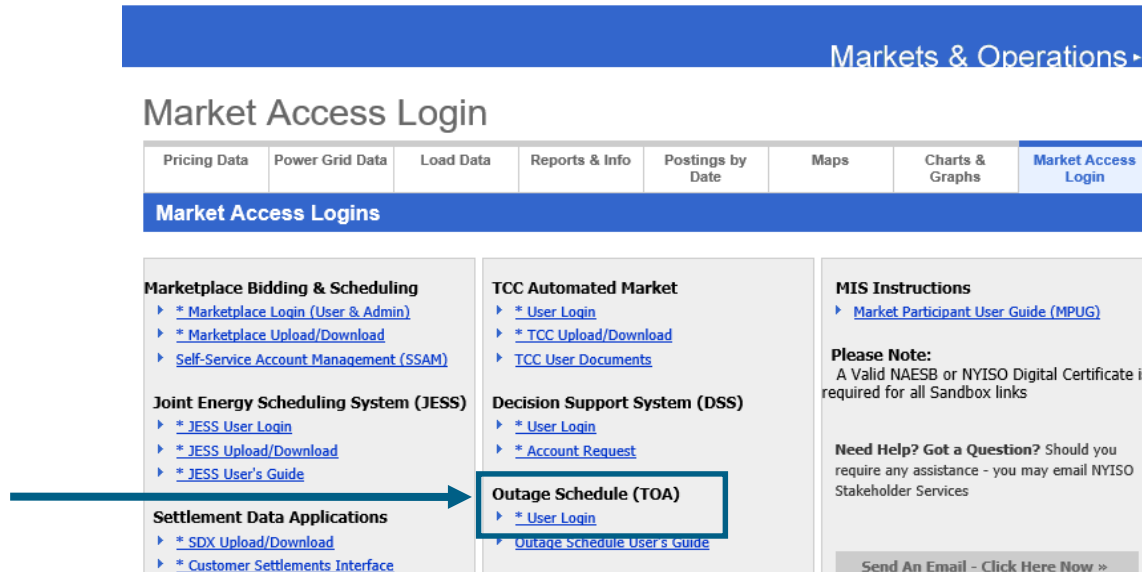
- **Scheduled Outage Submittals**
- **3 Types of Outages: Out-of-Service, Derate, In-Service**
- **Submittal Processes:**
 - **Manual Submittal Methods**
 - E-Mail
 - Telephone
 - Manual Entry into iTOA
 - **CSV Upload into iTOA**
- **Submit Request to NYISO Generation Scheduling Desk and Local TO**
- **A derate to 0 MW should be scheduled as OOS**

Outage Scheduling Application

■ Outage Scheduling via iTOA

- Outage Scheduler Application (iTOA)

http://www.nyiso.com/public/markets_operations/market_data/market_access_login/index.jsp



Markets & Operations ▾

Market Access Login

Pricing Data	Power Grid Data	Load Data	Reports & Info	Postings by Date	Maps	Charts & Graphs	Market Access Login
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Market Access Logins

Marketplace Bidding & Scheduling

- ▶ [* Marketplace Login \(User & Admin\)](#)
- ▶ [* Marketplace Upload/Download](#)
- ▶ [Self-Service Account Management \(SSAM\)](#)

Joint Energy Scheduling System (JESS)

- ▶ [* JESS User Login](#)
- ▶ [* JESS Upload/Download](#)
- ▶ [* JESS User's Guide](#)

Settlement Data Applications

- ▶ [* SDX Upload/Download](#)
- ▶ [* Customer Settlements Interface](#)

TCC Automated Market

- ▶ [* User Login](#)
- ▶ [* TCC Upload/Download](#)
- ▶ [TCC User Documents](#)

Decision Support System (DSS)

- ▶ [* User Login](#)
- ▶ [* Account Request](#)

Outage Schedule (TOA)

- ▶ [* User Login](#)
- ▶ [Outage Schedule User's Guide](#)

MIS Instructions

- ▶ [Market Participant User Guide \(MPUG\)](#)

Please Note:
A Valid NAESB or NYISO Digital Certificate is required for all Sandbox links

Need Help? Got a Question? Should you require any assistance - you may email NYISO Stakeholder Services

[Send An Email - Click Here Now »](#)

Notifications

Generator Owners Notified via Email as to Status of Request(s)

- Submitted
- Evaluating
- Approved
- Denied
- Completed
- Modifications to Existing Requests
- Cancelled

Coordinating Events with NYISO

- **Units must provide the NYISO Scheduling Department and local TO with unit outage and rescheduled unit outage requests**
 - Based on best available information at the time, no later than 30 calendar days before the first day of every operative month
 - The resource may schedule or reschedule a unit outage on a shorter timeframe if certain conditions are met
- **NYISO must receive at least two (2) calendar days notice of a Maintenance Outage (MO) or Maintenance Derating (D4)**
- **All outages and derates for which NYISO receives fewer than two calendar days notice will automatically be characterized as FORCED**
- **Units should schedule outages consistent with the classification they expect to enter for their GADS reporting**

Outage Scheduling References

- **NYISO Outage Scheduling Manual**
 - Sections 3 & 4
- **Outage Scheduler User Guide**
- **NYISO Installed Capacity Manual**
 - Section 4
- **NPCC Document C-13**
 - Operational Planning Coordination
- **Market Services Tariff**
 - Section 5
- **NYISO Generation Scheduling Desk**
 - Telephone: 518-356-6050
 - Email: genplan@nyiso.com
- **iTOA Generator Owner Outage Scheduling**

GADS Performance Data

Summarizes unit operations monthly

NYISO Performance Data

Reported on two separate records

- **Record 01**

- Record Code, Utility, Unit, Year, Month, Revision Code
- Net Max Capacity, Net Dependable Capacity, Net Actual Generation, Attempted & Actual Starts

- **Record 02**

- Record Code, Utility, Unit, Year, Month, Revision Code
- Unit Time Information-Number of Hours of:
- Service, Reserve Shutdown, Pumping (mode), Synchronous Condenser (mode), Available, Planned Outage, Forced Outage, Maintenance Outage, Extensions of Scheduled Outages, Unavailable, Period

Performance Elements- Key Data

Record Code	05 for Performance data
Utility (Company) Code	3-char. code from NERC GADS Data Reporting – Appendix C
Unit Code	Same 3-char. code used in the Event reporting for the same unit
Year	4-digit year for the period reported
Month	2-digit, <i>e.g.</i> , 02 for Feb, 11 for Nov
Revision Code	1-digit, (1-9) signals a correction, addition to previously reported data
Record Number	Either 01 for first record or 02 for second; at end

Performance Elements-Record 01

Net Max Capacity	Gross Max Capacity (MW) less station service	6-digit
Net Dependable Capacity	Max sustainable net output (MW) if there are no constraints. Seasonal verification required	6-digit – must not be greater than NMC
Net Actual Generation	Actual net generation (MWhr) during the reporting month	9-digit – if negative enter the minus sign in the column immediately left of reported value

Performance Elements-Record 01

Attempted Unit Starts	Number of attempted starts in reported month.	3-digit - Repeated initiations of startup without accomplishing corrective repairs are counted as a single attempt.
Actual Unit Starts	Number of times the unit successfully started in the month	3-digit- must be less than or equal to attempted starts

NYISO Performance Data – Record 02

- Record 02
 - Record Code, Utility, Unit, Year, Month, Revision Code
 - Unit Time Information-Number of Hours of:
 - Service, Reserve Shutdown*, Pumping*, Synchronous Condenser*, Available, Planned Outage, Forced Outage, Maintenance Outage, Extensions of Scheduled Outages, Unavailable, Period

*** Not reported by Wind/Solar/Energy Storage Units**

Performance Elements-Record 02

Service Hours	# hrs unit was synchronized to the system	<u>5-digit=3+2 decimals</u>
Reserve Shutdown Hours*	# hrs unit was available but not synchronized for economic reasons	5-digit- must equal total of RS hours reported for this month
Pumping Hours*	# hrs unit operated as a pump/motor	5-digit
Synch Condensing Hours*	# hrs operated in synchronous condensing mode	5-digit - Do not report in unit service hours

* Not reported by Solar/Wind/Energy Storage Units

Performance Elements-Record 02

Available Hours	Sum of Unit Service, Reserve Shutdown, Pumping and Synch Condenser Hours	5-digit
Planned Outage Hours	Sum of hrs unit was off-line due to NYISO Approved Planned Outage (PO) events	5-digit – must equal total of PO hours reported for this month
Forced Outage Hours	Sum of hrs unit was off-line for immediate, delayed or postponed outages (U1, U2, U3 and SF) events	5-digit – must equal total of U1, U2, U3 and SF hours reported for this month

Performance Elements-Record 02

Maintenance Outage Hours	Sum of hrs unit was off-line due to Maintenance Outage (MO) events	5-digit - must equal total of MO hours reported for this month
Extension of Scheduled Outage Hours	Sum of hrs unit was off-line due to Scheduled Outage Extension (PE/ME) events	5-digit - must equal total of PE/ME hours reported for this month
Unavailable Hours	Sum of Planned (PO), Forced (U1, U2, U3, SF), Maintenance (MO) and Ext to Scheduled Outages (PE/ME) hours	5-digit - must equal total of PO, U1, U2, U3, SF, MO & PE/ME hours reported for this month
Period Hours	# hrs in the month	5-digit - Available Hrs + Unavailable Hrs must equal Period Hours

Period Hours

- The GADS editing program is designed to use:
 - 744 hours for 31-day months (Jan, Mar, etc.)
 - 720 hours for 30-day months (Jun, Sep, etc.) and
 - 672 hours for February (696 hours in leap year)

Period Hours

- It also adjusts for Daylight Savings Time and leap-years:
 - March 743 hours
 - November 721 hours
 - Leap-Years 8784 hours

Period Hours

- There are two exceptions where fewer hours can be correctly reported
 - When a unit goes commercial
 - When the unit is retired or taken out of service for several years (aka Mothballed or MB)

Period Hours

- **Exception #1- When a unit goes commercial**
 - The program checks the Design Data for the date of commercial operation and will accept data after that point
- **Exception #2- When the unit is retired or taken out of service for several years (aka Mothballed or MB)**
 - The Period Hours will be 0 for each month in the Inactive State (MB). Inactive Hours will be equal to the normal monthly Period Hours

SUMMARY SHEETS OF REQUIRED FIELDS

NYISO GADS Data

Required Event fields for NYISO GADS Data

	Event Record 01	Event Record 02
Report Code	✓	✓
Utility (Company) Code	✓	✓
Unit Code	✓	✓
Year	✓	✓
Revision Code	✓	✓
Record Number	✓	✓
(Event Only)		
Event Number	✓	✓
Event Type	✓	✓
Start Date/Time	✓	
End Date/Time	✓	
Net Available Capacity	✓	
System/Comp. Cause Code		✓
Event Contribution Code		✓

NYISO GADS Data

Required Performance fields for NYISO GADS Data

	Performance Record 01	Performance Record 02
Report Code	✓	✓
Utility (Company) Code	✓	✓
Unit Code	✓	✓
Year	✓	✓
Revision Code	✓	✓
Record Number	✓	✓
(Performance Only)		
Month	✓	✓
Net Max. Capacity	✓	✓
Net Dependable Capacity	✓	
Net Actual Generation	✓	
Unit Loading		



Attempted Unit Starts	✓	
Actual Unit Starts	✓	
Reserve Shutdown Hours		✓
Pumping Hours		✓
Synch. Condensing Hours		✓
Service Hours		✓
Available Hours		✓
Planned Outage Hours		✓
Forced Outage Hours		✓
Maintenance Outage		✓
Ext of Scheduled Outages		✓
Unavailable Hours		✓
Period Hours		✓

Minimum Equivalent Data

	Performance Record 01	Performance Record 02
Report Code	✓	✓
Utility (Company) Code	✓	✓
Unit Code	✓	✓
Year	✓	✓
Revision Code	✓	✓
Record Number	✓	✓
(Performance Only)		
Month	✓	✓
Net Max. Capacity	✓	✓
Net Dependable Capacity	✓	
Net Actual Generation	✓	
Unit Loading		



Attempted Unit Starts	✓	
Actual Unit Starts	✓	
Service Hours		✓
Available Hours		✓
Planned Outage Hours		✓
Forced Outage Hours		✓
Maintenance Outage		✓
Ext of Scheduled Outages		✓
Unavailable Hours		✓
Period Hours		✓

This Equivalent data set is reported by Solar/Wind/Energy Storage units only, without event data

COMMON DATA ERRORS

Event and Performance

Common Errors – Data Problems

- **Missing Data**
 - **Essential Event Data**
 - **Start & End Date/Times (Beginning & End of Year)**
 - **Event Type Codes (Outages, Derates, Reserve Shutdowns)**
 - **Net Available Capacity on Derating events only (must be >0)**
 - **Essential Performance Data**
 - **Hours Totaled Incorrectly (avail + unavail = period)**
 - **Generation Limits Error (Output Factor > 100% Max Net Capacity)**

Common Errors – Time Issues

- **Start & End Date/Time reversals**
 - Start date/time must be prior to end date/time
 - Events ending at midnight should be reported as 0000 of the next day
 - End date/time of 01/31 @ 2400 report as 02/01 @ 0000
 - Events that span a year-end
 - End on last day of first yr 12/31 @ 24XX
 - Restart on first day of new yr 01/01 @ 00XX

Common Errors -Event Cause Code Issues

- Cause Codes that are not assigned to the appropriate generator type
 - Gas turbine reporting jet engine Cause Code
 - Internal combustion unit reporting gas turbine Cause Code

Common Errors - Incorrect Event Characterization

- **Run-of-River Hydro – Lack of water**
 - Lack of water is equivalent to lack of fuel and should not be reported as a Reserve Shutdown (RS)
 - It should be reported as a Forced Derate (D1, D2, D3) or Forced Outage (U1, U2, U3)
- **Gas Turbine – Lack of fuel**
 - A gas-only GT shutdown for lack of gas is not a Reserve Shutdown (RS)
 - It should be reported as a Forced Outage (U1, U2, U3)

Common Errors -Incorrect Event Characterization

- Hydro – Debris in water
 - Debris in the water is a normal condition that should be handled through normal maintenance. It should be reported as Maintenance Outage (MO) or Forced Outage (U1)
 - It is not Out of Management Control (OMC)

Common Errors - Outside Management Control (OMC) Reporting

9300 is the only OMC Cause Code that NYISO currently excuses from the calculation of the unit's Derating Factor

Common Errors -Derate Issues

- **Derate capacity reported must be the net available capacity not the amount of MW reduced**
 - A 100 MW generator that is limited to 80 MW should report 80 MW as the net available capacity not 20 MW

Common Errors -Combined Cycle (CC) Generators – GADS BLOCK Data

- NYISO prefers to receive GADS data for the entire CC as BLOCK data, not the individual components
 - The failure of the CC BLOCK to start is a Startup Failure (SF)
 - In a 2x1 CC, the failure of the second GT to start should be reported as a derate
 - In a 2x1 CC, the derate of one GT must include 50% of the ST output

Common Errors -Performance Reporting Issues

- Hours and MW must properly total
 - A unit can be in one of two performance states –Available or Unavailable
(Available hrs + Unavailable hrs = Period hrs)
 - Individual Available hour categories must equal the total Available hours value
(Service hrs + Reserve Shutdown hrs + Synchronous Condensing hrs + Pumping hrs = Available hrs)

Common Errors -Performance Reporting Issues

- Hours and MW must properly total
 - The Unavailable hour categories must equal the total Unavailable hours value:
(Planned Outage hrs + Maintenance outage hrs + Forced Outage hrs + Outage Extension hrs = Unavailable hrs)
 - The Net Actual Generation (NAG) should not exceed the product of the Period hours and the Net Maximum Capacity (NMC) in a month

GADS Software*

<u>Source/Product</u>	<u>Features</u>	<u>Cost</u>
In-House Programs	♦Variable	Variable
Integ / PowerGADS	<ul style="list-style-type: none"> ♦Data entry and edit ♦Validation ♦Reporting and analysis ♦Data portal is possible 	Contact vendor
Microsoft Windows application – Notepad or Excel	No validation	Component of MS Windows OS or common product
Navigant Consulting / MicroGADS Gold	<ul style="list-style-type: none"> ♦Data entry and edit ♦Validation ♦Reporting and analysis ♦Data portal is possible 	Contact vendor
<p>GADS Open Source</p> <p>*The NYISO does not endorse any software product or vendor</p>	<ul style="list-style-type: none"> ♦Data entry and edit ♦Validation ♦Reporting and analysis ♦Data Portal Facilities built-in 	Free

Use of GADS Data

- We have covered the creation of GADS Data

- Let's look at -
 - Equivalent Forced Outage Rate on demand (EFORd)
 - Peak Load Window Equivalent Forced Outage Rate on demand (PLW EFORd)

Calculation of EFORd – EDL PLW

- The Services Tariff* defines it as: “The portion of time a unit is in demand, but is unavailable due to forced outages”
- The Peak Load Window is an operations-adjusted time of demand for resources with Energy Duration Limitation (EDL), from which their EFORd will be calculated

6-hour Peak Load Window	
Summer Capability Period	Winter Capability Period
HB 13 through HB 18	HB 16 through HB 21
8-hour Peak Load Window	
Summer Capability Period	Winter Capability Period
HB 12 through HB 19	HB 14 through HB 21

*Market Services Tariff-Definitions 2.5

Calculation of EFORd

Definitions	
Abbreviation	Factor
SH	Service Hours
RSH	Reserve Shutdown Hours
AH	Available Hours
FOH	Full Forced Outage Hours

All hours are weighted by the monthly Net Maximum Capacity (NMC) in the NYISO calculation of EFORd

Calculation of EFORd

Definitions	
Abbreviation	Factor
NDC	Net Dependable Capacity
NAC	Net Available Capacity
D	Capacity derate for outage (NDC - NAC)
C	Net Maximum Capacity (NMC) during derate event
T_{D_s}	Start of derate event
T_{D_e}	End of derate event

Calculation of EFORd

Definitions	
Abbreviation	Factor
T_D	Time accumulated during outage/derate
EFOH	Equivalent Full Forced Outage Hours
EFDH	Equivalent Forced Derated Hours

Calculation of EFORD

$$\text{EFORD}(\%) = \frac{f_f * \text{FOH} + f_p * \text{EFDH}}{\text{SH} + f_f * \text{FOH}} * 100$$

- Formulae used in calculation of Unforced Capacity for Installed Capacity Suppliers:

*** Installed Capacity Manual, Attachment J:Unforced Capacity for Installed Capacity Suppliers

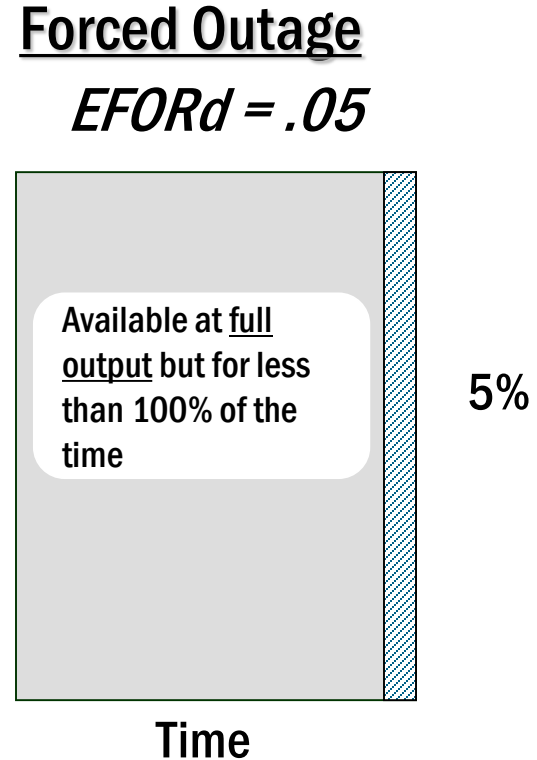
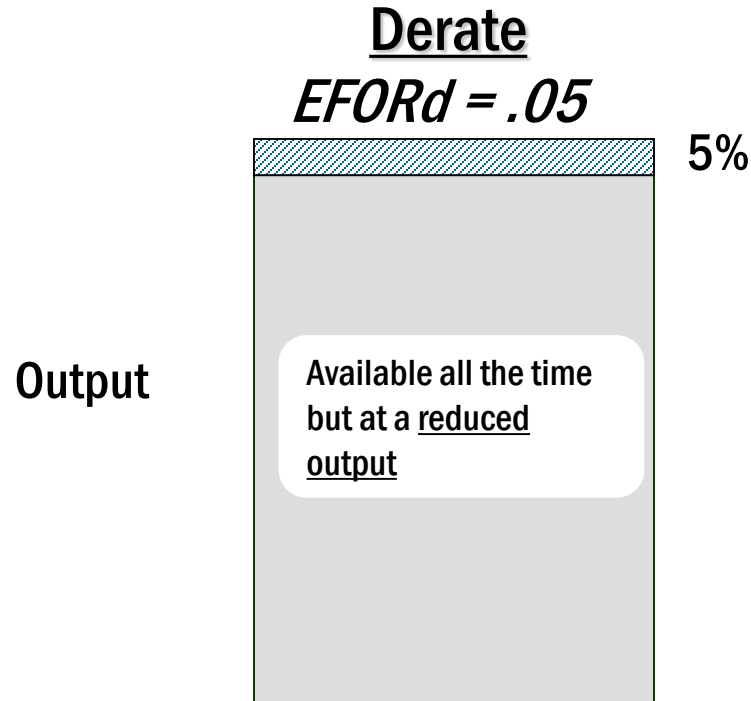
*** NERC GADS DRI, Appendix F: Performance Indexes and Equations

Outage/Derating States and EFORd

Outages and Startup Failure	Impact on EFORd
Planned Outage PO	No
Maintenance Outage MO	No
Planned Outage Extension PE	No
Maintenance Outage Extension ME	No
Unplanned (Forced) Outage Immediate U1	Yes
Unplanned (Forced) Outage Delayed U2	Yes
Unplanned (Forced) Outage Postponed U3	Yes
Startup Failure SF	Yes

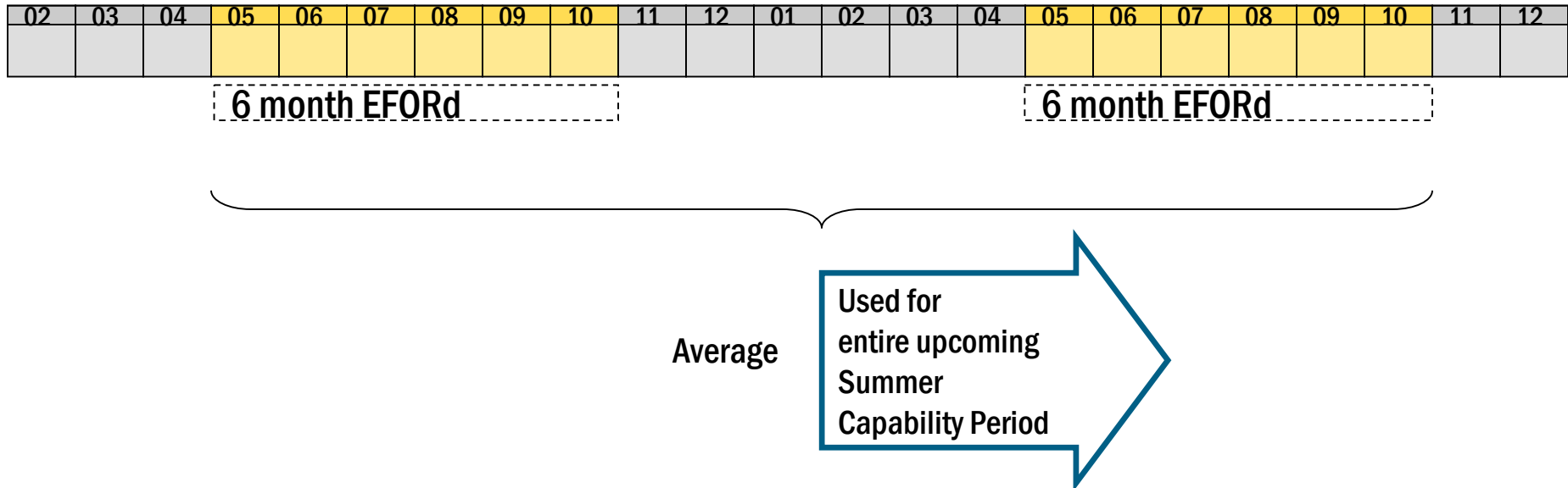
Derates	Impact on EFORd
Planned Derate PD	No
Maintenance Derate D4	No
Planned Derate Extension DP	No
Maintenance Derate Extension DM	No
Unplanned (Forced) Derate Immediate D1	Yes
Unplanned (Forced) Derate Delayed D2	Yes
Unplanned (Forced) Derate Postponed D3	Yes

Derates and Outages



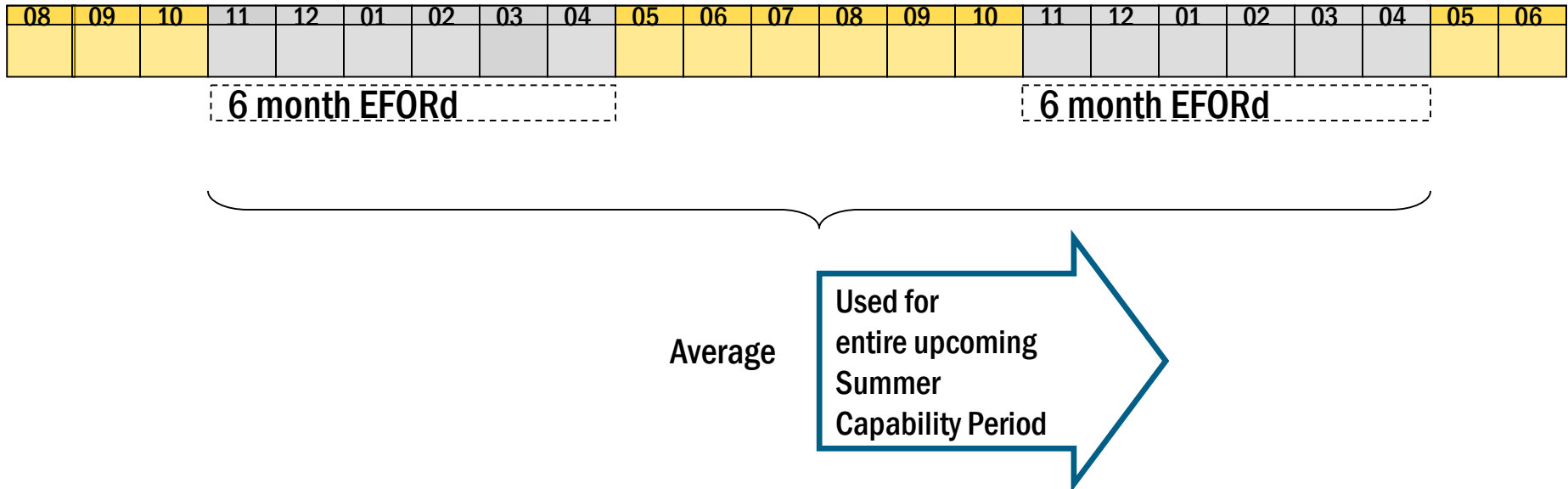
Summer UCAP Calculation

NYISO uses an average of the last two previous 6-month EFORd calculations to establish a Summer ICAP to UCAP derating factor ($\text{Avg EFORd, AEFORd}_{\text{summer}}$)



Winter UCAP Calculation

NYISO uses an average of the last two previous 6-month EFORD calculations to establish a Winter ICAP to UCAP derating factor ($\text{Avg EFORD, AEFORD}_{\text{Winter}}$)



Example - Seasonal AEFORd Determination

Calculation 1: (May 2019 – Oct 2019)	= 2.70%
Calculation 2: (May 2020 – Oct 2020)	= 1.10%
Average of 2 EFORd calculations	= 1.90%
Derating factor (AEFORd) as a decimal	= 0.0190

If the generator has a Summer 2021 Adjusted ICAP of 79.6 MW, then UCAP for Summer 2021 Capability Period is:

$$\begin{aligned}\text{UCAP} &= (1 - \text{AEFORd}) * \text{Adjusted ICAP} \\ &= (1 - 0.0190) * 79.6 \text{ MW} \\ \text{UCAP} &= 78.1 \text{ MW}\end{aligned}$$

EFORd for Returning Units

- For units with Mothball, ICAP Ineligible Forced Outage (IIFO), or a period in Inactive state:
 - Derating factor will be calculated using operating data from the most recently available like-months.
 - See ICAP Manual section 4.4.10 for more details

- If unit returning to service, which while in these outages, made modifications to its operating characteristics that are determined to be material by the NYISO and require the submission of a new Interconnection Request:
 - Unit will receive the derating factor it would have received as a newly connecting unit in lieu of a derating factor developed from unit-specific data
 - A unit returning with an increase in its capability but not as the result of a material change in its operating characteristics would receive a derating factor under the rule discussed in the first bullet above, not under this rule

What is EFORd Used for?

- Installed Capacity Market Calculations
 - The market product is Unforced Capacity (UCAP)

$$\text{UCAP} = \text{Adjusted ICAP} \times (1 - \text{Derating Factor})$$

$$\text{UCAP} = (1 - \text{EFORd}) * \min(\text{CRIS}, \text{DMNC}) * \text{Duration Adjustment Factor}$$

$$\text{Adjusted Installed Capacity} = \min(\text{CRIS}, \text{DMNC}) * \text{Duration Adjustment Factor}$$

$$\text{UCAP} = (1 - \text{EFORd}) * \text{Adjusted Installed Capacity}$$

- Exceptions are noted on next slide

* See the ICAP Manual, Section 4, or MST Section 5.12.6.1 for more information

EFORd Equivalent Situations

- **Resources for which the NYISO does not use [traditional] EFORd to determine Unforced Capacity values – they have comparable derating factors**
 - **Solar/Wind & Landfill Gas**
 - **Actual production data during peak load periods is used to calculate the Derating Factor**
 - **Run-of-River Hydro**
 - **Actual production data during peak load hours is used to calculate the Derating Factor**
 - **Energy Storage Resources**
 - **Derating Factor calculated based upon time-weighted availability evaluated against the ICAP sold**
 - **Special Case Resources (SCRs)**
 - **Performance Factor (PF) value calculated with data supplied outside of the NERC GADS process**
 - **Resources with Energy Duration Limitation (EDL)**
 - **EFORd calculated using GADS data from within the Peak Load Window (PLW) only**

References for Derating Factors

<u>Unit Type</u>	<u>Derating Factor</u>	<u>ICAP Manual Reference(s)</u>
Conventional Generator, Energy Limited Resource (ELR), Capacity Limited Resource (CLR)	Equivalent Demand Forced Outage Rate: EFORd	Section 4.5 Section 4.4.4
Resources with Energy Duration limitation (EDL)	Peak Load Window Equivalent Demand Forced Outage Rate: PLW EFORd	Section 4.1.1 Section 4.5
Special Case Resources (SCR)	Historical Performance Factor	Section 4.12
Intermittent Power Resources (Wind, Solar, Landfill Gas)	Actual Performance “Production Factor”	Section 4.5, Attach J Section 3.4
Limited Control Run-of-River Hydro	Actual Production Data	Section 4.5
Energy Storage Resources	Average Unavailability Factor	Attach J Section 3.7

Penalties for Noncompliance with GADS Reporting to NYISO

- Failing to submit data
 - Service Tariff section 5.12.12.1
 - Starting on third day – greater of \$500 or \$5/MW for each day
 - Starting on the tenth day – sanction increase to greater of \$1,000 or \$10/MW for each day
 - These are discretionary penalties

Penalties for Noncompliance with New York ISO GADS Reporting to NYISO

- Inaccurate data submission
 - Groups within NYISO examine GADS data submitted
 - Generation owner/operators are required to correct inaccurate data

Penalties for Noncompliance with GADS Reporting to NYISO

- **Inaccurate data submission**
 - Corrections to data may cause adjustments to Derating Factor values
 - **A correction that generates a higher Derating Factor value will reduce the unit's UCAP value**
 - The unit may have already sold more UCAP capacity than it was qualified to sell
 - NYISO may apply deficiency charges of oversold amount plus a 50% penalty

Online GADS Portal

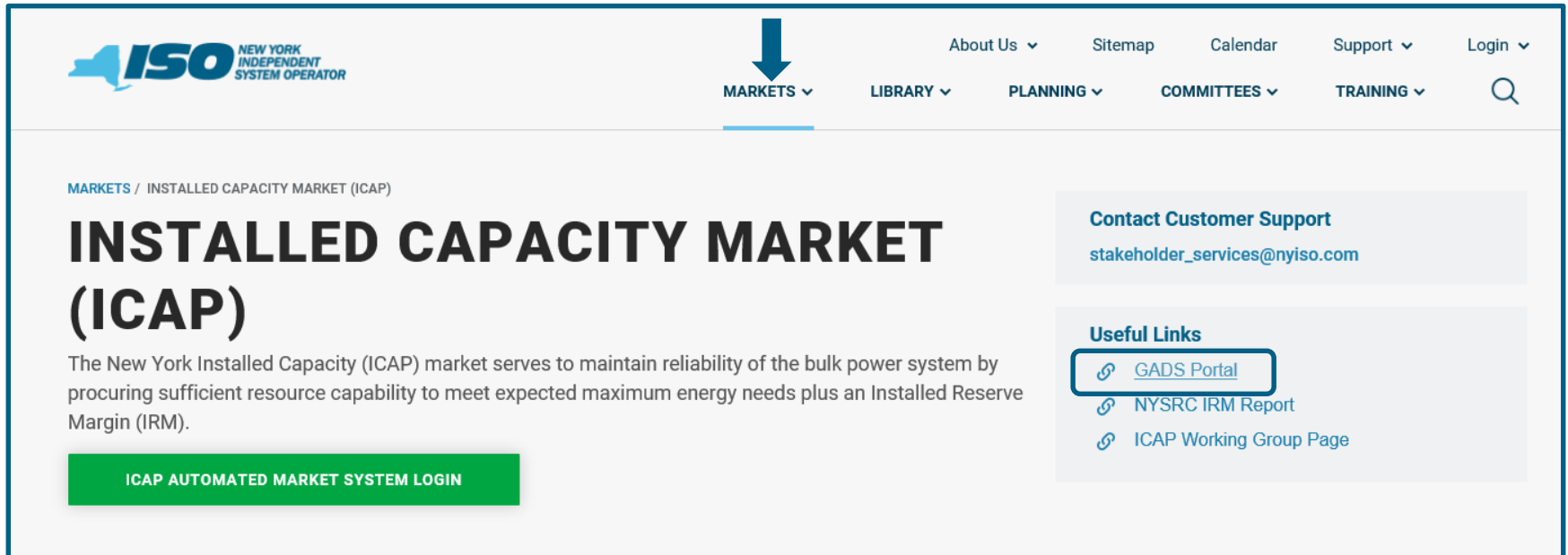
GADS Portal

- **Portal Requirement - Users**
 - NAESB Digital Certificate (linked to MIS User Account)
 - MIS User Account
 - User Account must have the “GADS – GADS Observer” privilege
 - Contact NYISO GADS Administrator to add User to the Portal – Internal User’s List

GADS Portal

- gads.nyiso.com
- Link to the Portal exists on the main ICAP page
- Login with MIS User Name (lowercase only)
- Password is the MIS Password

GADS Portal – Link



The screenshot shows the New York ISO website's navigation menu with a blue arrow pointing to the 'MARKETS' dropdown. The breadcrumb trail is 'MARKETS / INSTALLED CAPACITY MARKET (ICAP)'. The main heading is 'INSTALLED CAPACITY MARKET (ICAP)'. Below it is a paragraph describing the ICAP market's role. A green button labeled 'ICAP AUTOMATED MARKET SYSTEM LOGIN' is visible. On the right, the 'Useful Links' section has a blue box around the 'GADS Portal' link.

ISO NEW YORK INDEPENDENT SYSTEM OPERATOR

MARKETS ▾ LIBRARY ▾ PLANNING ▾ COMMITTEES ▾ TRAINING ▾

About Us ▾ Sitemap Calendar Support ▾ Login ▾

MARKETS / INSTALLED CAPACITY MARKET (ICAP)

INSTALLED CAPACITY MARKET (ICAP)

The New York Installed Capacity (ICAP) market serves to maintain reliability of the bulk power system by procuring sufficient resource capability to meet expected maximum energy needs plus an Installed Reserve Margin (IRM).

ICAP AUTOMATED MARKET SYSTEM LOGIN

Contact Customer Support
stakeholder_services@nyiso.com

Useful Links

- [GADS Portal](#)
- [NYSRC IRM Report](#)
- [ICAP Working Group Page](#)

Portal Login Screen



NYISO GADS Portal

Enter User Name & Password

User Name:

Password:

(User Name and Password are case sensitive)

Portal Options



Generating Availability Data System (**GADS**) Portal

Hello G MPUSER

Upload & Process

Upload GADS ASCII files to the NYISO server, process uploaded files or check status of processing.

Edit Data

View and correct uploaded data.

Reports

View reports from results of last processed files.

Version 14.8.15.118

Summary of Process

- Upload file
- Correct errors through portal directly or User's GADS and upload corrected file
- Select 'Submit' each time you make a correction directly in the portal
- Run Final Validation/Error Check for each unit corrected in the portal
- Select 'Process Data' (Edit Screen) one last time to commit the corrections to the NYISO's GADS database and start the Data Analysis

Additional Resources

- [GADS Portal User's Guide](#)
- [NYISO Installed Capacity Manual](#)
- [Installed Capacity Manual Attachments](#)
- [GADS Training Course Material](#)

Questions?

For any future assistance, please contact NYISO Stakeholder Services at stakeholder_services@nyiso.com or by phone at (518) 356-6060