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

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E-Learning Suite

GADS Presentation Suite

- Chapter 1: Origin and Introduction to GADS
- Chapter 2: GADS Data Submission
  - GADS Design Data
  - GADS Event Data
  - GADS Performance Data
- Chapter 3: Guidelines for Event/Performance Data Reporting
  - Common Data Errors
  - Summary Sheets
  - Penalties for Non-Compliance
- Chapter 4: Use of GADS Data by the NYISO- EFORd Calculation
- Chapter 5: GADS Portal Navigation
- Chapter 6: NYISO Outage Scheduling
- Chapter 7: Event Reporting-Scenarios

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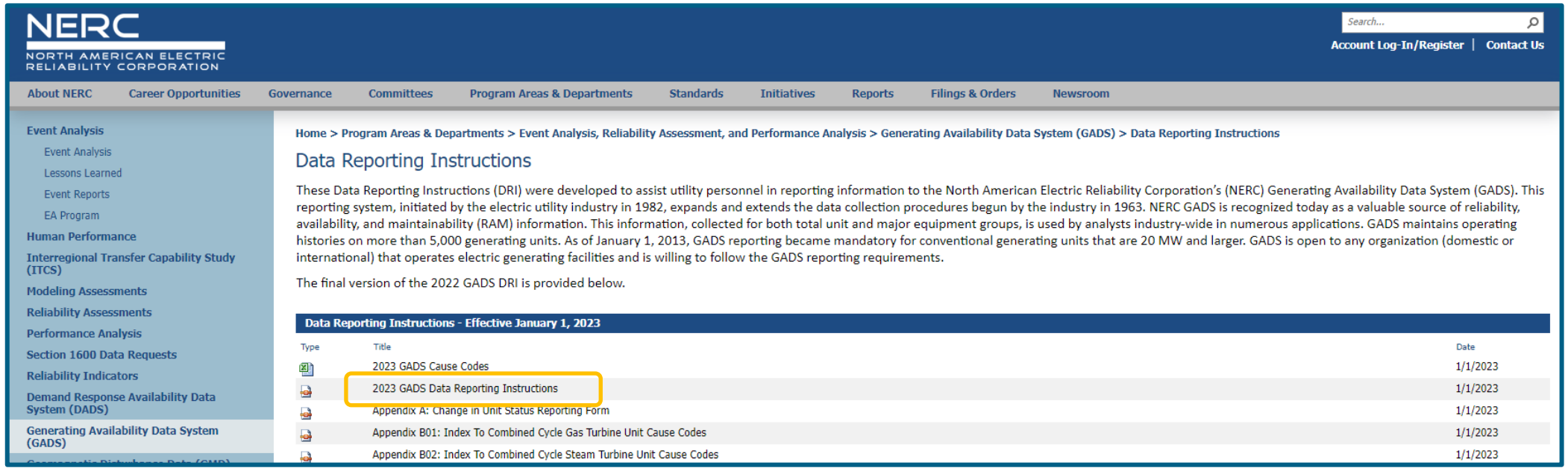
Chapter 1: Origin and Introduction to GADS

Generating Availability Data System (GADS) Overview

- Established by NERC in 1982 to expand data collection activities begun in the 1970s
  - To voluntarily collect, record, and retrieve operating information including data on forced outages, maintenance and deratings of electric generating equipment in order to improve their performance
- Uses IEEE Standard 762, "Definitions for Use In Reporting Electric Generating Unit Reliability, Availability and Productivity"
- Mandatory GADS reporting for conventional generating units to NERC began January 2013

GADS Overview

- General GADS information and the "GADS Data Reporting Instructions" (DRI) from the North American Electric Reliability Corporation (NERC) can be found on the NERC website
- The GADS Data Reporting Instructions document details the procedures, format, and frequency to follow when reporting data to NERC



Differences between NERC and NYISO requirements

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	NERC	NYISO
Submission requirement	Mandatory for 20 MW or larger conventional units effective 2013	Required for all non-Demand Reduction resources
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's Use of GADS Data

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

Installed Reserve Margin (IRM)

- IRM: Annually determined amount of Installed Capacity required to be procured by the NYISO above firm system load, which is expressed as a percentage
- Established annually by the NYS Reliability Council (NYSRC) for the upcoming Capability Year
  - GADS reporting provides data about unit performance,-outages, and derates that is used in the probabilistic analysis that the NYISO conducts for the NYSRC process
- Based on the Northeast Power Coordinating Council (NPCC) Standard for Resource Adequacy
- Required for the calculation of the Installed Capacity needs of NYCA and the starting point in the NYISO's determination of Locational Minimum Installed Capacity Requirements ("LCRs") used to operate NYISO's capacity markets

Equivalent Demand Forced Outage Rate (EFORd)

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- 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 and 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 Overview

Design

- Identifies the unit as a unique entity
- Submitted once

Event

- Specific data for each unit event
  - Outages, Derates, Reserve Shutdowns etc.
- Submitted monthly

Performance

- Summary of unit operation for a month
- Submitted monthly

Additional Resources

- MST Tariff
- ICAP Manual
- ICAP Manual Attachments
- Outage Scheduling Manual
- GADS FAQs

Generating Availability Data System (GADS) as Used Under NYISO Rules Chapter 2

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Chapter 2: GADS Data Submission

- Design, Event and Performance Data

NYISO GADS DESIGN DATA

- Identifies the unit as a unique entity

Design Data

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- Resources are required to submit this data to the NYISO (typically once), separate and distinct from what a Resource 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; alpha-numeric)
- Unit Code (3-character)
- 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 -199	Fossil (Steam) (Use 600-649 if additional numbers are needed)
200 – 299	Nuclear
300 – 399	Combustion Turbines (use 700-799 if add'l numbers needed)
400 – 499	Diesel Engines
500 – 599	Hydro/Pumped Storage Units (use 900-999 if add'l numbers needed)
650 – 699	Fluidized Bed Combustion Units
800 – 899	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 – Appendix C
Unit Code	A unique ID (3-char.) assigned by the owner based on the criteria from NERC GADS Data Reporting
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	- 24-hour clock - Midnight reported as 2400 - Beginning of day is 0000
End of Event	Time (month/day/hour/minute) the event ended	Events that span more than one reporting period should have no end time until the event ends*
Net Available Capacity	Capacity available with derating	Only reported for derating events

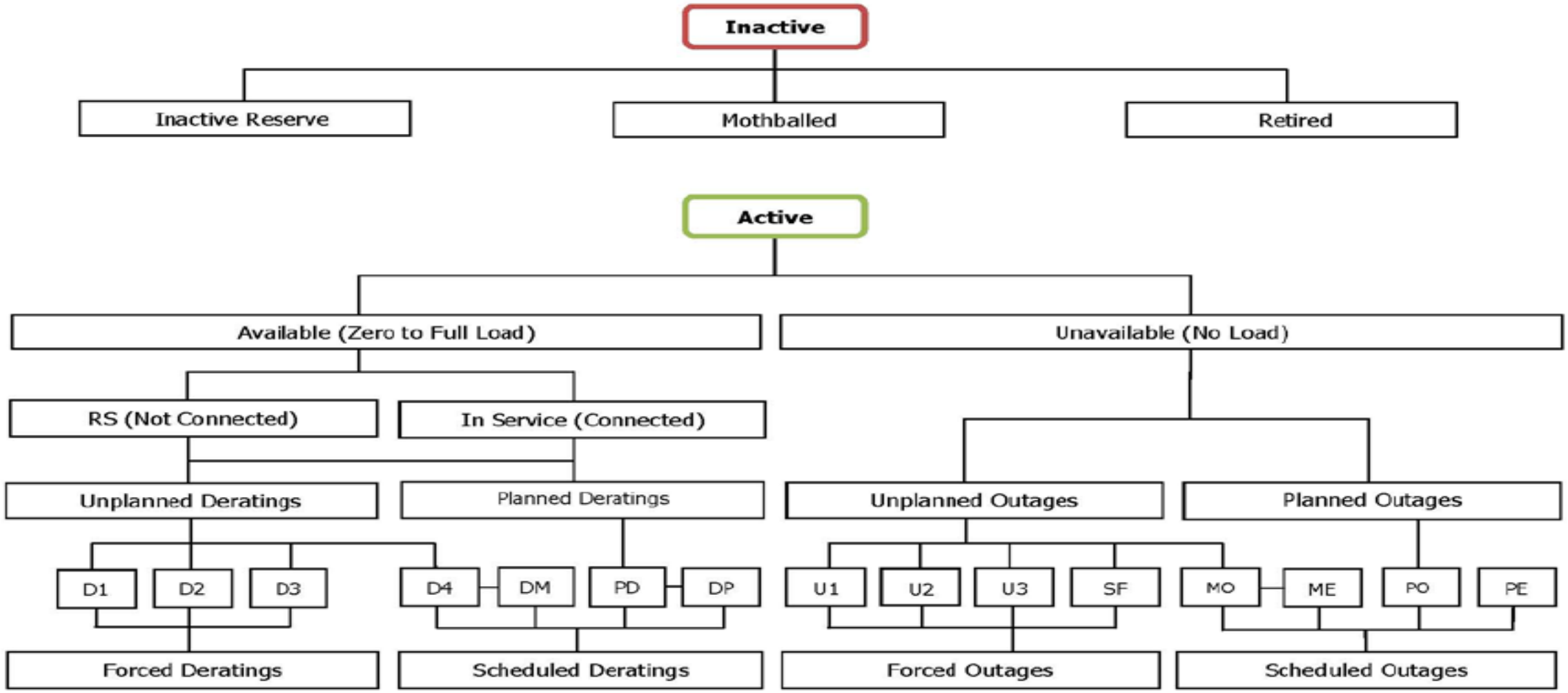
* Events spanning years: An event cannot extend beyond a calendar year. For a longer event, or an event that starts before the overlaps two calendar years will be broken into separate events. The first entry will record an event that ends on 12/31 of that year and will be reported for Dec, and a new event record will be started for 01/01 of the next year with a new Event Number

100 kW GADS submission threshold: For Distributed Energy Resources (DER) that have a Net Maximum Capacity (NMC) of 100 kW or less, all GADS data submitted will be assumed to be kW values for NYISO's GADS purposes

Event Elements: Event Number

- 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

Unit States-Event Type



* NYISO only collects GADS data from Active Units

Inactive States

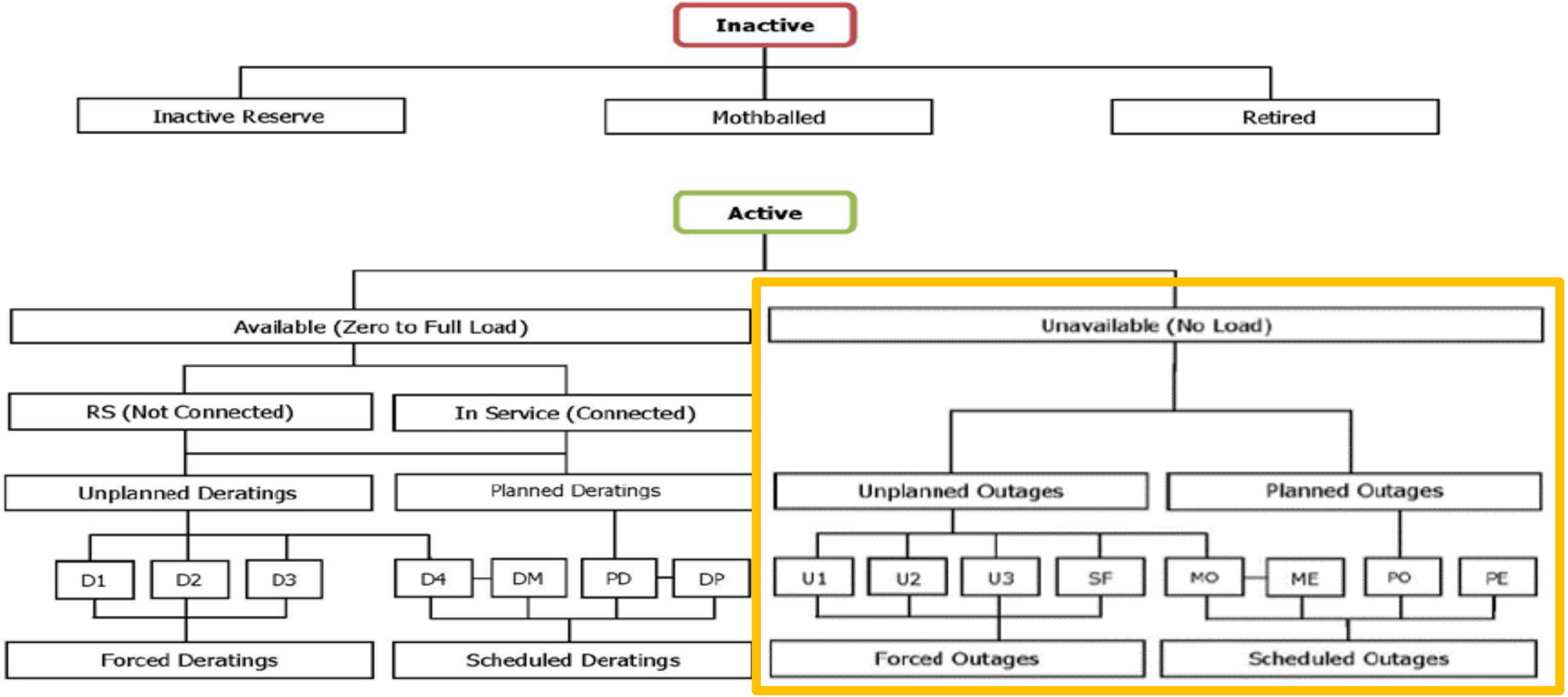
Inactive Reserve	IR	Unavailable but can be brought back quickly with repairs
Mothballed	MB*	Unavailable but can be brought back in weeks or months with repairs
Retired	RU	Unit is unavailable and not expected to return to service in the future

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

* DER resources are not eligible to enter a Mothballed (MB) state

See DRI Section III, page 5-6, 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 that received NYISO's approval (with minimum two days notice) 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 from NERC rules. 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

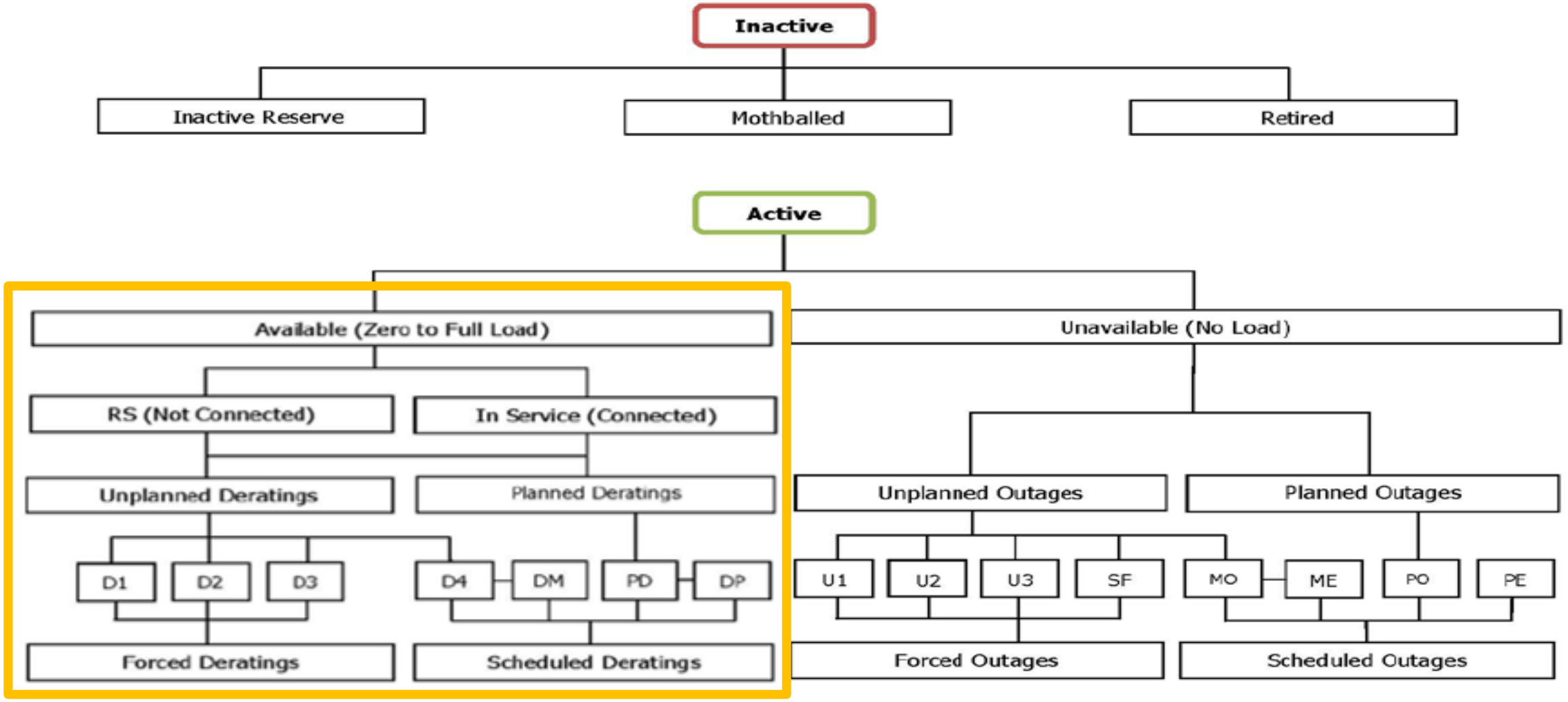
ICAP Ineligible Forced Outage – IIFO*

- A Generator will be placed on an ICAP Ineligible Forced outage by the NYISO, according to ISO procedures, if:
  - It is on a Forced Outage (U1, U2, U3, SF) for 180 days without a finding by the NYISO that it has credible repair plan
- A Generator can voluntarily reclassify itself to an IIFO after at least sixty (60) days of being on a FO
- A unit in an IIFO will report its status as a Forced Outage in its GADS data provided to the NYISO

* Individual DER are ineligible to enter an IIFO

Section 4.4.13 ICAP Manual

Unit State – Active, Available



Scheduled Deratings

Planned Derating	PD	Schedule well in advance for a predetermined duration
Maintenance Derating	D4	Approved by NYISO, 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 hours, but requires a reduction in capacity before the end of the next weekend

Derating States

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

Miscellaneous States

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

* NYISO does not use or require these events

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 – 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

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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 how 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

Section VI in the DRI for 2020 GADS Cause Code Changes

Event Elements – Record 02

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Event Contribution Code	
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

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, *e.g.*, 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

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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

100 kW GADS submission threshold: For Distributed Energy Resources (DER) that have an NMC of 100 kW or less, all GADS data submitted will be assumed to be kW values for NYISO's GADS purposes

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 Intermittent Power Resources (IPRs) and Energy Storage Resources (ESRs)

Performance Elements-Record 02

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Service Hours	# hrs unit was synchronized to the system	5-digit=3+2 decimals
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 Wind/Solar Intermittent Power Resources (IPRs) and Energy Storage Resources (ESRs)

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:

	Period Hours
31-Day months (Jan, May, etc.)	744 Hours
30-Day months (Jun, Sept, etc.)	720 Hours
March (EDT to EST, Daylight Savings shift)	743 Hours
November (EST to EDT, Daylight Savings shift)	742 Hours
February (Non-Leap year)	672 hours
February (Leap Year)	696 Hours
Total Hours (Non-Leap Year)	8,760 Hours
Total Hours (Leap Year)	8,784 Hours

Period Hours

- There are two exceptions where fewer hours can be correctly reported
  - 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

Additional Resources

- MST Tariff
- ICAP Manual
- ICAP Manual Attachments
- Outage Scheduling Manual
- GADS FAQs

Generating Availability Data System (GADS) as Used Under NYISO Rules Chapter 3

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Chapter 3: Guidelines for Event/Performance Data Reporting

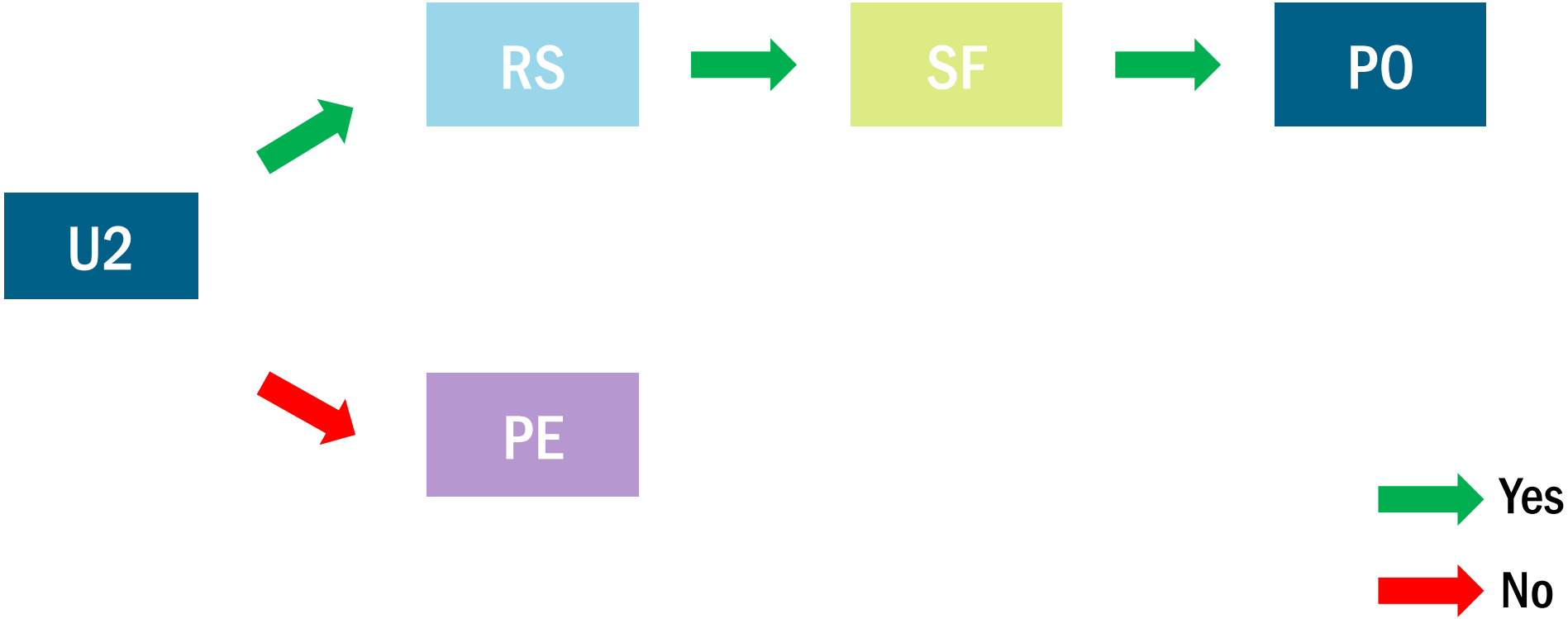
1. Allowable State Transitions

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	*IEEE Standard 762 does not recognize transition to/of deratings from/to other event types except as shown.*									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

Allowable State Transitions



From the GADS DRI, Section III Event Reporting

2. Testing Following Outages

- Periods of testing of equipment after outages need to be reported to GADS
- Online testing (Synchronized to grid)
  - If unit is in service at a reduced load:

Initial Outage	Testing Reported as
Planned Outage (PO)	Planned Derating (PD)
Maintenance Outage (MO)	Maintenance Derating (D4)
Forced Outage (U1,U2 or U3)	Unplanned Forced Derating (D1)

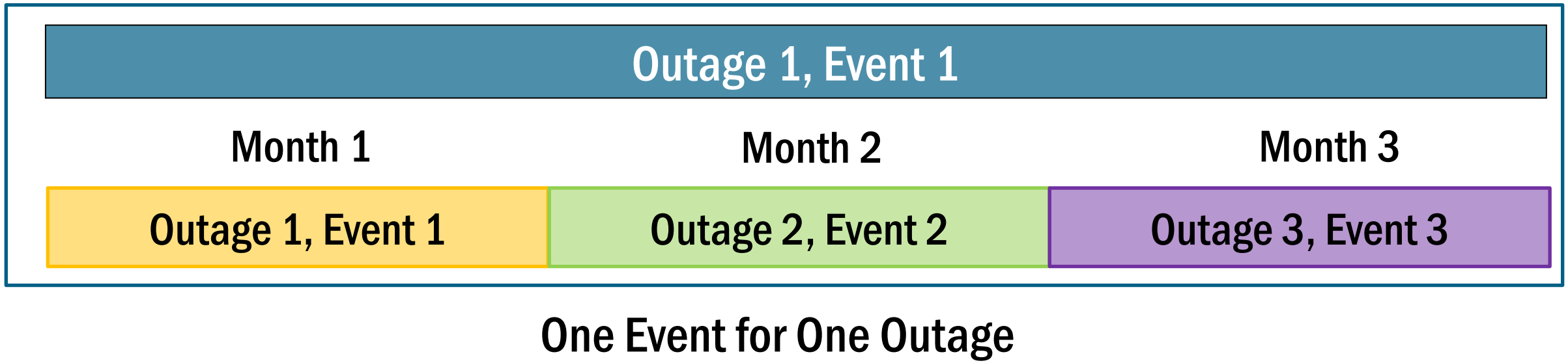
- Off-line testing (Not synchronized to the grid)
  - Testing period will be part of the event
  - Outage ends when testing is complete, and unit is placed in service or enters another state

3. 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 outage event for GADS submittal
- The NYISO's outage scheduling department will be involved in the ultimate determination of whether the event extension will be forced or not, and the event must be reported accordingly in GADS

4. Events Spanning Periods

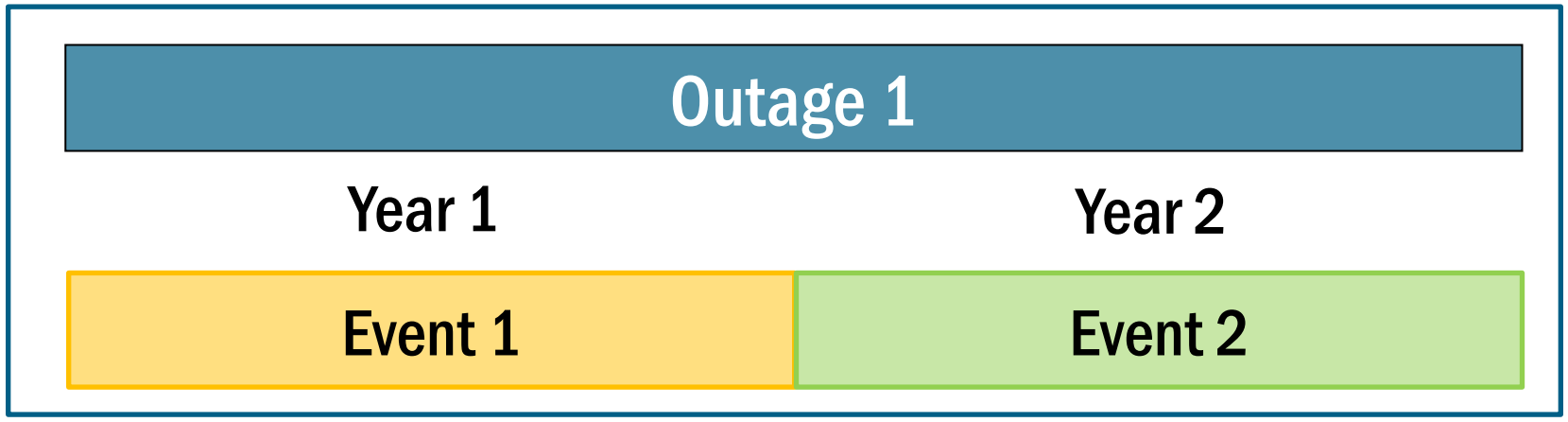
- Events spanning months are also reported as one event, even if GADS data is due to NYISO every month by the 20th
- It is recommended to leave the event end date open ended, if event is still ongoing at time of submission of GADS data
  - Report the end date/time after the event is finished



One Event for One Outage

5. Events Spanning Periods

- Events spanning years
  - Event should end on the 12/31 at 24XX in the GADS report for December
  - New event with a new event number must be reported in January of the next year with event starting at 01/01 at 00XX



Two Event Numbers for One Outage, spanning years

Section III, GADS DRI Event Reporting III-17 and III-18

6. Events Starting/Ending During Daylight Savings Transition Period

- When an event starts/ends during the Daylight-Saving transition period, a manual adjustment must be made to either the event or performance data
  - Eastern Standard Time (EST) is in effect from early November to mid-March
    Eastern Daylight Time (EDT) is in effect from mid-March to early November
- The NYISO recognizes that this manual adjustment differs from the NERC standard submission requirements

Events Starting/Ending During Daylight Savings Transition Period

Eastern Daylight Time (EDT) to Eastern Savings Time (EST) - November								
GMT	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00
Eastern Time	22:00	23:00	00:00	01:00	01:00	02:00	03:00	04:00

EDT → EST

EDT to EST Shift (November)

- Event ending during shift period:
  - If the event ends in the *first* occurrence of HB01 (HB05 GMT), no changes to event data are required
    - NYISO GADS software assumes the event ended during the first occurrence of HB01
    - Performance data must account for the extra hour under the Event state the unit is performing in after GMT HB05
  - If the event ends during the *second* occurrence of HB01 (HB06 GMT), a manual adjustment must be made to the event data
    - The event itself should be shifted out of the DLS shift window to avoid any submission error

EDT to EST Shift (November) Example

Eastern Daylight Time (EDT) to Eastern Standard Time (EST) - November								
				EDT →	EST			
GMT	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00
Eastern Time	22:00	23:00	00:00	01:00	01:00	02:00	03:00	04:00

Event 1 occurred from 0:00 to 1:30 (2nd occurrence)

Event 1 Reported as 2:00 to 4:30 (to capture all 2 hours)

EDT to EST Shift (November)

- Event starting during shift period:
  - If the event starts during the *first* occurrence of HB01 (HB05 GMT), a manual adjustment must be made to the event data
    - The event itself should be shifted out of the DLS shift window to avoid any submission error
  - If the event starts in the *second* occurrence of HB01 (HB06 GMT), no changes to event data are required
    - NYISO GADS software assumes the event started during the second occurrence of HB01
    - Performance data must account for the extra hour under the Event state the unit is performing in before GMT HB06

EDT to EST Shift (November) Example

Eastern Daylight Time (EDT) to Eastern Standard Time (EST) - November								
					EDT →	EST		
GMT	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00
Eastern Time	22:00	23:00	00:00	01:00	01:00	02:00	03:00	04:00

Event 1 occurred from 1:30 to 2:30 (1st occurrence)

Event 1 Reported as 2:30 to 4:30 (to capture all 2 hours)

EST to EDT Shift (March)

Eastern Standard Time (EST) to Eastern Daylight Time (EDT) - March								
GMT	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00
Eastern Time	21:00	22:00	23:00	00:00	01:00	03:00	04:00	05:00

EST → EDT

- The NYISO GADS Software does not allow events to be submitted between HB02 (GMT06) and HB03 (GMT07)
- For events overlapping the EST to EDT shift, the NYISO GADS software automatically accounts for the loss of an hour

7. Cause Code Guidelines

- Code that identifies the system, major component or piece of equipment involved in the event
- Part of Event Record 02

GADS DRI Attachments for Cause Code Information	
Attachment B	4-digit Cause Codes for each type of unit
Attachment D	Cause Code Cross Reference, identifies allowable range of system/component cause codes for each type of unit

Cause Code Guidelines - Examples

Unit selection

- Assign Cause Codes to the appropriate unit type

Major Component/System

- Assign event cause to major component or system
- Not to auxiliary component or operation that triggered the failure of the major component or system

Single/Multiple Component

- Use Cause Code for specific component when power supply serves a single component
- Use Cause Code for power supply system when it serves multiple components

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 Code Guidelines – Examples

Pumping and Synchronous condensing modes

- Use Cause code 9345 when unit is in Pumping mode
- Use Cause code 9340 when unit is in Synchronous condensing mode

Choosing Cause Codes

- Use “External”, “Safety, Regulatory, and Environmental” Cause Codes when no other system/component Cause Code applies
- Example: If a new limit on emissions is imposed and is exceeded even though the scrubber is functioning properly, then use an environmental code

Outside Management Control

- Cause Code 9300 is the only OMC Cause Code that NYISO currently excuses from the calculation of the unit’s Derating Factor
- Used for equipment failure that involves equipment located on the electrical network including and beyond the generator step-up transformer

Cause Code 9300

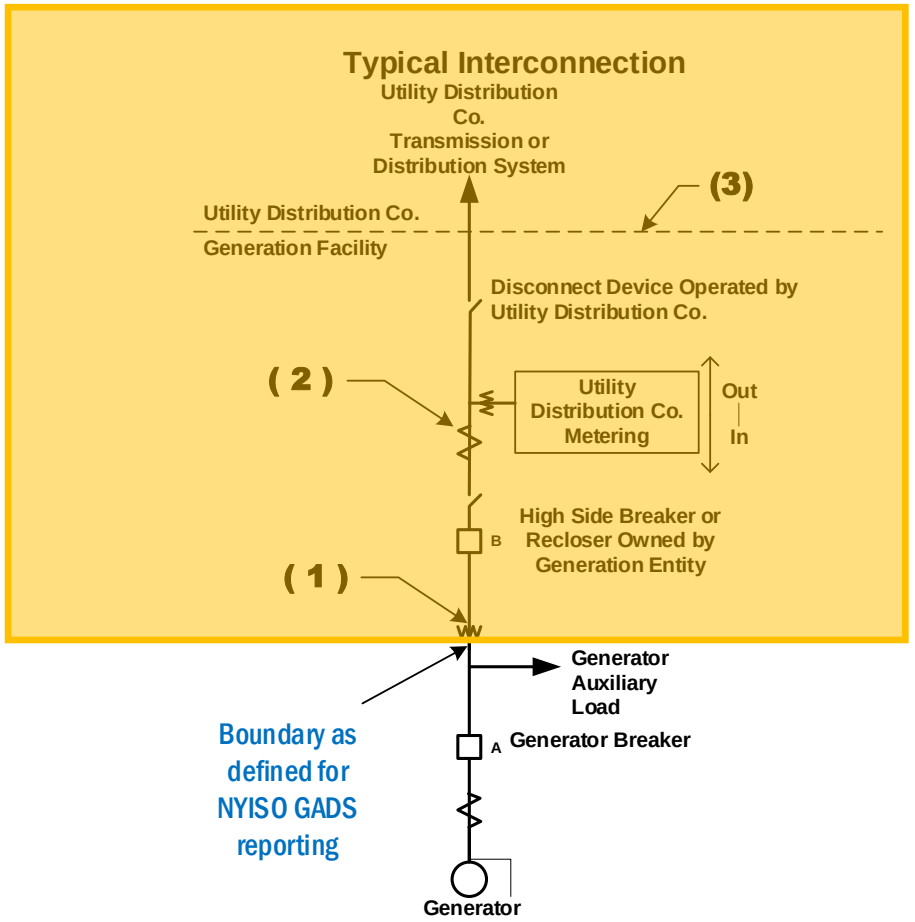
***

- Part of the list of “Outside Management Control” Cause Codes
  - Only one that does not expose the unit to EFORd degradation, for NYISO
- Used when the unit is forced into an outage by equipment failure that involves equipment located on the electrical network including and beyond the generator step-up transformer
  - These Events must be reported as a forced outage/derate event (U1, U2, U3, D1, D2, or D3) and must be coded with the 9300 Cause Code (transmission system problems other than catastrophes)

See NYISO Installed Capacity Manual section 4.6.2

Cause Code 9300- Plant Boundaries

- At what location on the electric network does the NYISO consider an electric equipment failure to be Outside of Management Control?
  - By NYISO Definition, Generator Owner responsibility ends at the low side bushings of the generator step-up (GSU) transformer



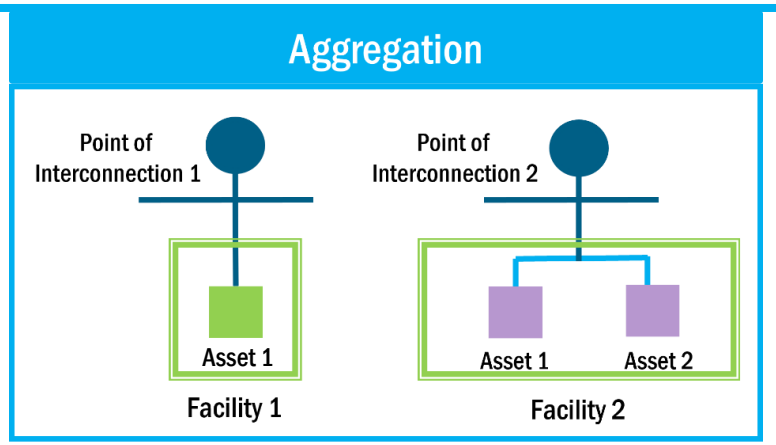
(Image credited to IEEE 762, Annex D)

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

8. GADS Submission for Distributed Energy Resources (DER)

***

- All generating assets enrolled within an Aggregation must submit GADS data for every month that the Aggregation is enrolled to participate in the NYISO's Installed Capacity market under the DER Participation model
- DER assets submit Event and Performance data based on GADS rules for their respective their technology type and fuel type
  - Example 1: DER generator assets submit monthly event and performance data
  - Example 2: DER ESR and Wind/Solar IPR assets only submit minimum equivalent performance data
  - Assets that are Demand reduction resources do not submit any GADS data
- 100 kW GADS submission threshold: For DER resources that have an NMC of 100 kW or less, all event and/or performance data submitted will be assumed to be kW values for NYISO's GADS purposes



Asset: Distinct technologies located behind a single Point of Interconnection (POI), associated with a single utility account and net meter

- Multiple assets of distinct technology and fuel type can make up a single DER

8. GADS Submission for Distributed Energy Resources (DER) ***

- All components of the asset must share the same generating technology and fuel type to enroll as a singular asset with an associated GADS submission record
  - Multiple Solar panels that form part of a Solar Resource, located behind a single POI and are associated with a single utility account and net meter will be grouped together as one asset for GADS data submission
  - An ESR located behind the same POI and associated with the same utility account and net meter will be considered a separate asset to the solar resource for GADS data submission
- Each conventional generator participating as an asset must be enrolled as a singular asset with an associated GADS submission record
  - Two thermal generators behind the same POI and associated with a single utility account and net meter will be considered two separate assets for GADS data submission

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		✓

***

Not required by Wind/Solar Intermittent Resources (IPRs) and Energy Storage Resources (ESRs)

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 Wind/Solar IPRs and ESRs, 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 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 - 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 -Derate Issues

***

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

Common Errors -Combined Cycle (CC) Resources – 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 Gas Turbine to start should be reported as a derate
  - In a 2x1 CC, the derate of one Gas Turbine must include 50% of the Steam Turbine 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

- There are multiple software packages in the market that can assist in the creation of GADS data
  - GADS Open Source
  - Navigant Consulting/MicroGADS Gold
  - Integ/Power GADS
  - Microsoft Windows application – Notepad or Excel
  - In-house Programs

Please note: This is for information only
The NYISO does not recommend any specific software to our Market Participants

Penalties for Non-Compliance

Penalties for Noncompliance with GADS Reporting to NYISO

- Failing to submit data
  - Penalties:
    - 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
  - The resource will be deemed to be in Forced Outage for each month that it does not submit GADS data

Market Services Tariff Section 5.12.12

ICAP Manual Section 4.6

Penalties for Non-compliance with GADS Reporting to NYISO

- Inaccurate data submission
  - Groups within NYISO examine GADS data submitted
  - Resource owner/operators are required to correct inaccurate data
  - 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
      - As a result of the initial data submission, the unit may have sold more UCAP than it was qualified to sell, which would result in an ICAP shortfall
      - NYISO may apply deficiency charges of oversold amount plus a 50% penalty

Market Services Tariff Section 5.14.2

Additional Resources

- MST Tariff
- ICAP Manual
- ICAP Manual Attachments
- Outage Scheduling Manual
- GADS FAQs

Generating Availability Data System (GADS) as Used Under NYISO Rules Chapter 4

Mathangi Srinivasan Kumar

Market Training Program Administrator, NYISO

E-Learning Suite

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Chapter 4: Use of GADS Data

- Calculation of EFORd

Calculation of EFORd using GADS Data

***

- EFORd: Equivalent Forced Outage Rate on demand
  - 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 as the derating factor to calculate the UCAP (Unforced Capacity) of certain types of units
    - Derating factor refers to the historical availability of a generating unit
  - Unforced Capacity (UCAP):
    - Capacity a supplier is qualified to offer in NYISO Installed Capacity market
    - Commodity bought and sold in the ICAP market

Calculation of EFORd- GADS Data used

Definitions	
Abbreviation	**Factor**
SH	Service Hours
RSH	Reserve Shutdown Hours
AH	Available Hours

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

Calculation of EFORd

Definitions	
Abbreviation	**Factor**
FOH	Full Forced Outage Hours
NDC	Net Dependable Capacity
NAC	Net Available Capacity
D	Capacity derate for outage (NDC - NAC)
C	Net Maximum Capacity (NMC) during derate event

Calculation of EFORd- GADS Data used

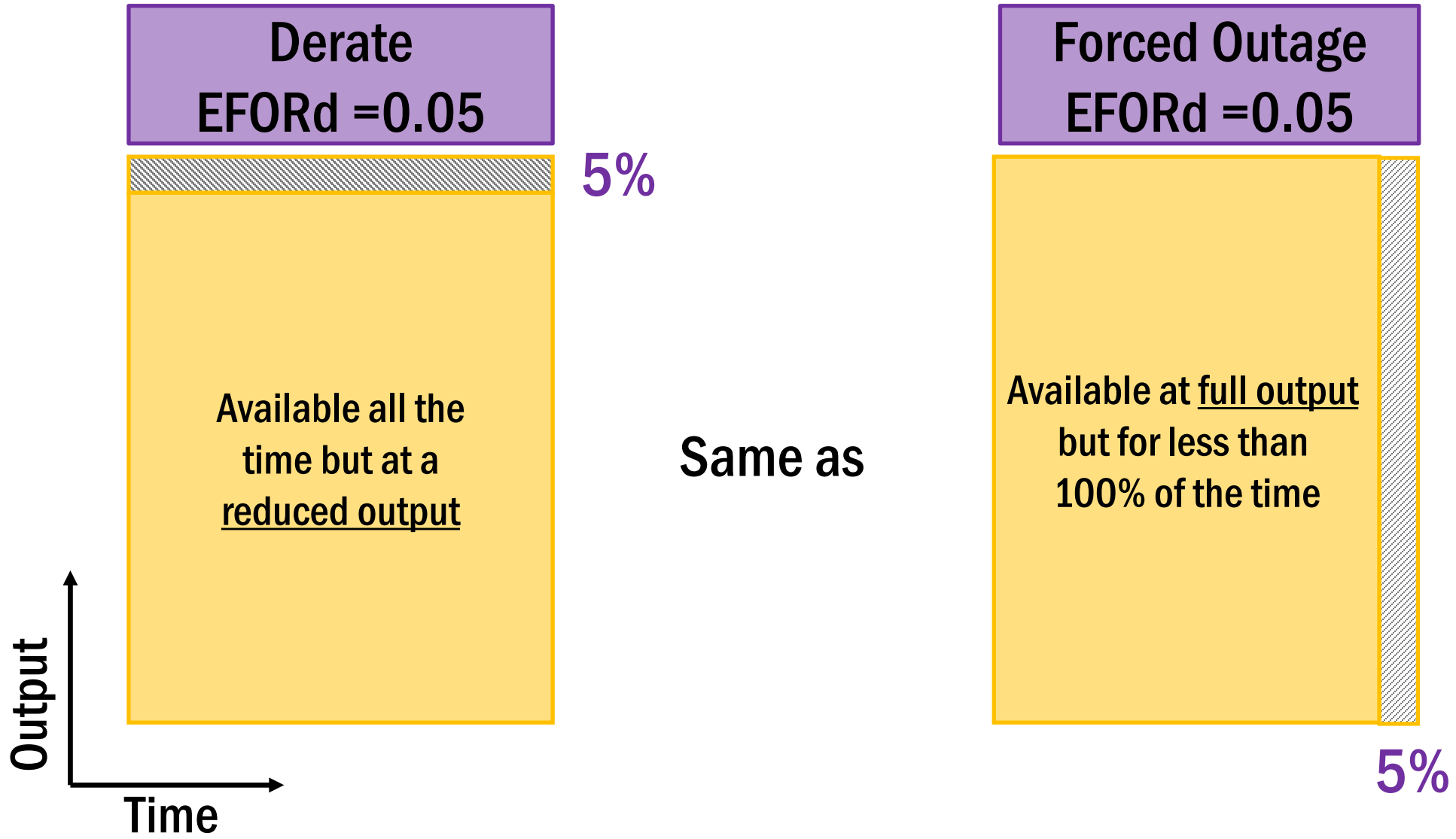
Definitions	
Abbreviation	Factor
T_{D_s}	Start of derate event
T_{D_e}	End of derate event
T_D	Time accumulated during outage/derate
EFOH	Equivalent Full Forced Outage Hours
EFDH	Equivalent Forced Derated Hours

Calculation of EFORd - Formula

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

- For detailed information about EFORd calculations, please refer to the following documents:
  - Installed Capacity Manual, Attachment J: Unforced Capacity for Installed Capacity Suppliers
  - NERC GADS DRI, Appendix F: Performance Indexes and Equations

Derates and Outages



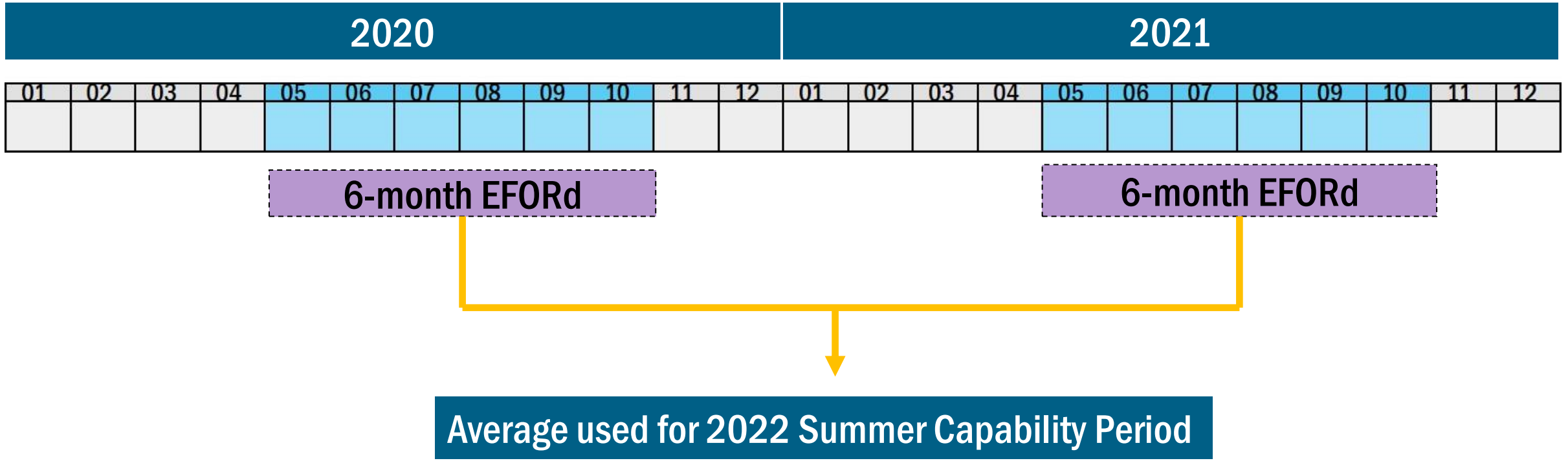
Outage/Derating States and EFORd

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

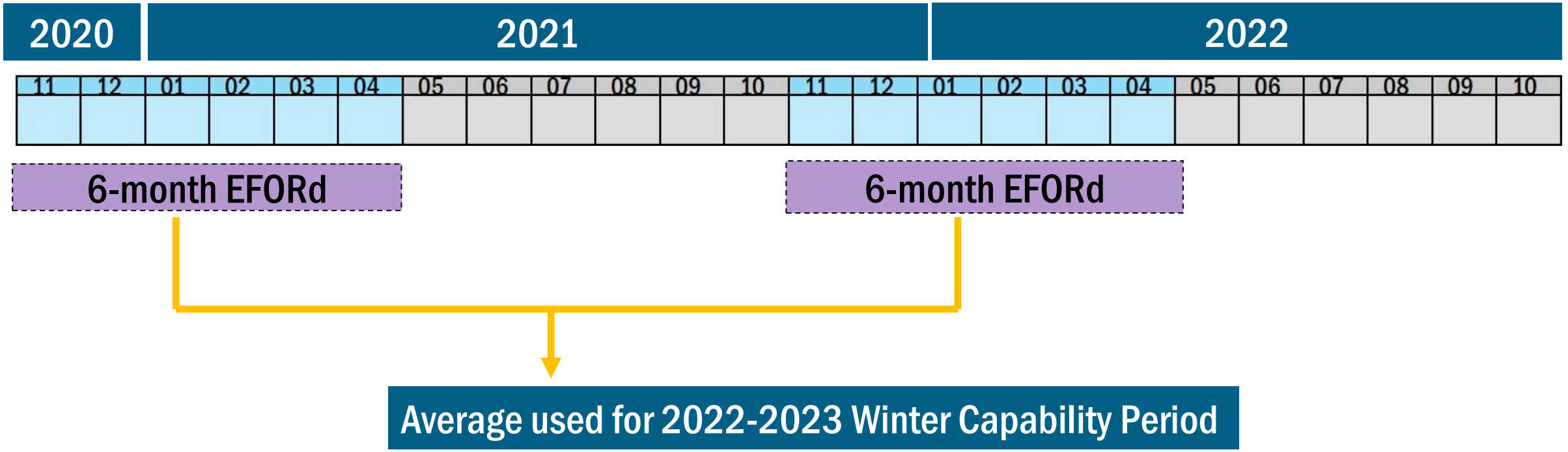
Summer UCAP Calculation

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



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 (Avg EFORd, $AEFORd_{Winter}$)



EFORd as Derating Factor in UCAP Calculations

***

UCAP = Adjusted ICAP * (1 – Derating Factor)

Adjusted ICAP = Available ICAP * Capacity Accreditation Factor

Available ICAP = Min (CRIS Cap*, DMNC)

*CRIS Caps different for Summer and Winter Capability Period

ICAP Manual, Section 4, or MST Section 5.12.6.1 for more information

Example - Seasonal AEFORd Determination ***

UCAP Calculation for an example generator for Summer Capability Period 2024, with and Adjusted ICAP of 79.6 MW

Calculation 1: (May 2022– Oct 2022)	2.70%
Calculation 2: (May 2023 – Oct 2023)	1.10%
Average of 2 EFORd calculations	1.90%
Derating factor (AEFORd) as a decimal	0.019

UCAP = Adjusted ICAP * (1 – AEFORd)

= 79.6 MW * (1 – 0.019)

= 78.1 MW

UCAP for Summer 2024 Capability Period = 78.1 MW

EFORd for Returning Units

- For returning units that were in a Mothball, ICAP Ineligible Forced Outage (IIFO), or a period in Inactive state:
  - Derating factor will be calculated using operating data from the most recent like-month(s) in which the generator was not in the respective outage/inactive state that precluded its eligibility to participate in the Installed Capacity market
- 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

Installed Capacity Manual, Section 4.4.13

Calculation of EFORd – EDL PLW

- Peak Load Window Equivalent Forced Outage Rate on demand (PLW EFORd)
  - For resources with an Energy Duration Limitation (EDL)
- 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
- Please note: Resources with Energy Duration Limitation (EDL) are still expected to submit a full year-to-date GADS data set

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 Section 5.12.14

References for Derating Factors

	Unit Type	Derating Factor	ICAP Manual Reference(s) ***
1	Conventional Resources, Energy Limited Resources (ELR), Capacity Limited Resources (CLR)	Equivalent Demand Forced Outage Rate: EFORd	Attachment J, Section 6.1
2	Conventional Resources, Energy Limited Resources (ELR), Capacity Limited Resources (CLR) with GADS equivalent Data	Average Outage Factor	Attachment J Section 6.2
3	Special Case Resources (SCR)	Historical Performance Factor	Section 4.12
4	Intermittent Power Resources (Wind, Solar, Landfill Gas)	Resource Specific Derating Factor (RSDF)	Attachment J Section 6.4
5	Limited Control Run-of-River Hydro	Resource Specific Derating factor (RSDF)	Attachment J Section 6.4
6	Energy Storage Resources	Average Unavailability Factor	Attachment J Section 6.7
7	Co-located Storage Resources	Performance factor and Average Unavailability Factor	Attachment J, Section 6.8
8	Distributed Energy Resources (DER)	Generator assets: EFORd Availability Based assets: Average Unavailability Factor Production based assets: Average Production Factor	Attachment J, Section 6.9

Additional Resources

- MST Tariff
- ICAP Manual
- ICAP Manual Attachments
- Outage Scheduling Manual
- GADS FAQs

Generating Availability Data System (GADS) as Used Under NYISO Rules Chapter 5

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Chapter 5: Online GADS Portal

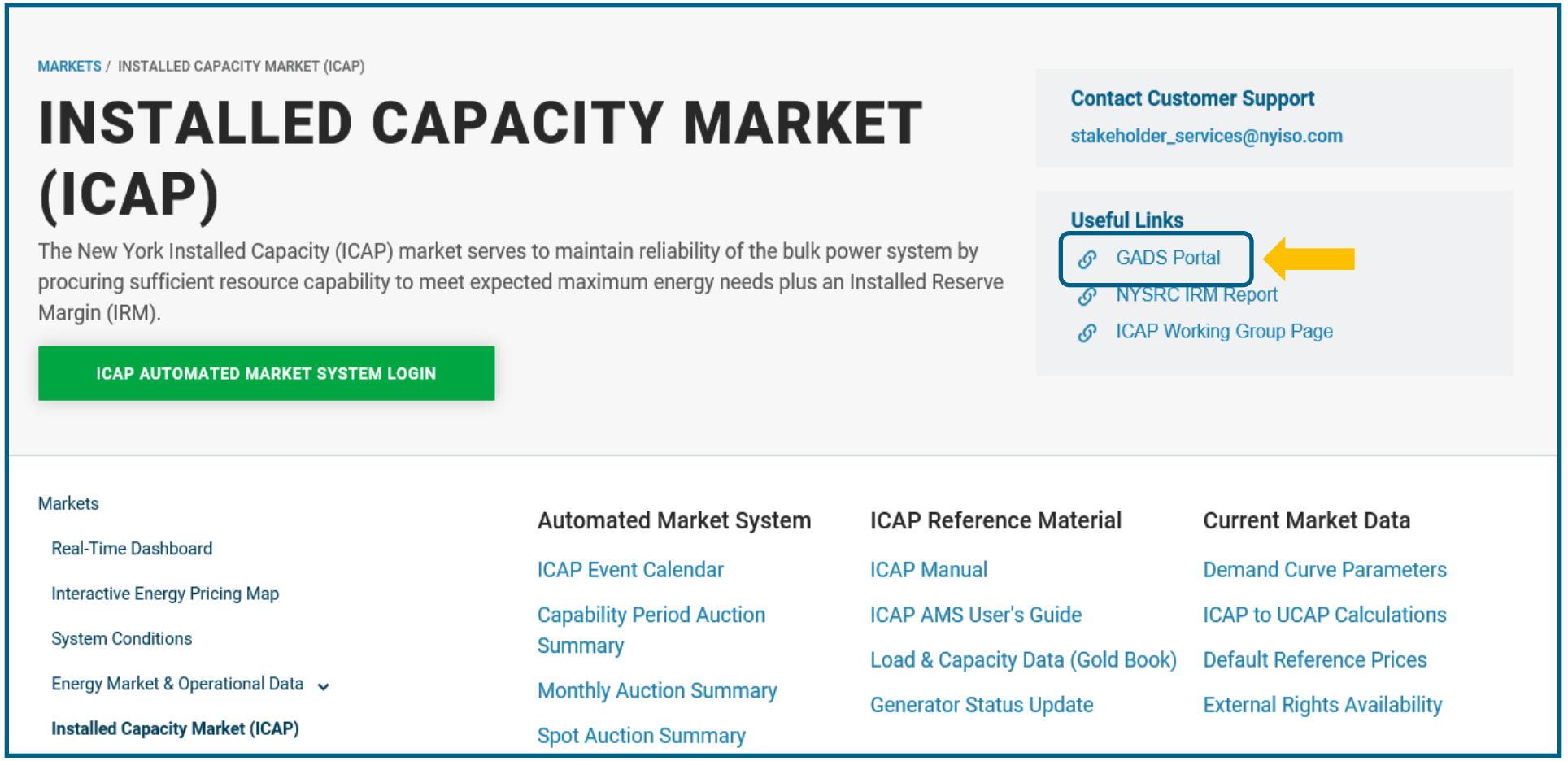
NYISO GADS Portal

- Market Participants (MPs) enter GADS Data directly via a user interface
  - NYISO GADS Portal accepts Performance and Event data
- MPs can correct errors identified by the GADS portal during the submittal process
- Portal can provide a Standard ICAP EFORd report

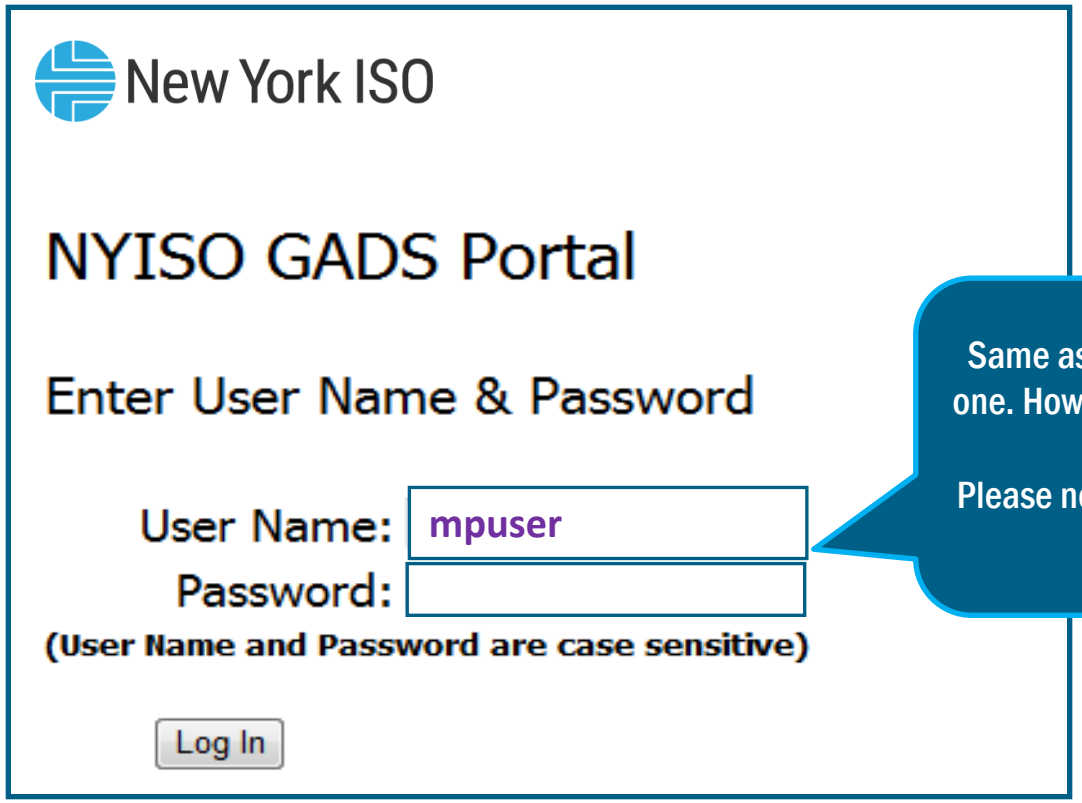
GADS Portal

- Portal Requirements - 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

NYISO Website Location



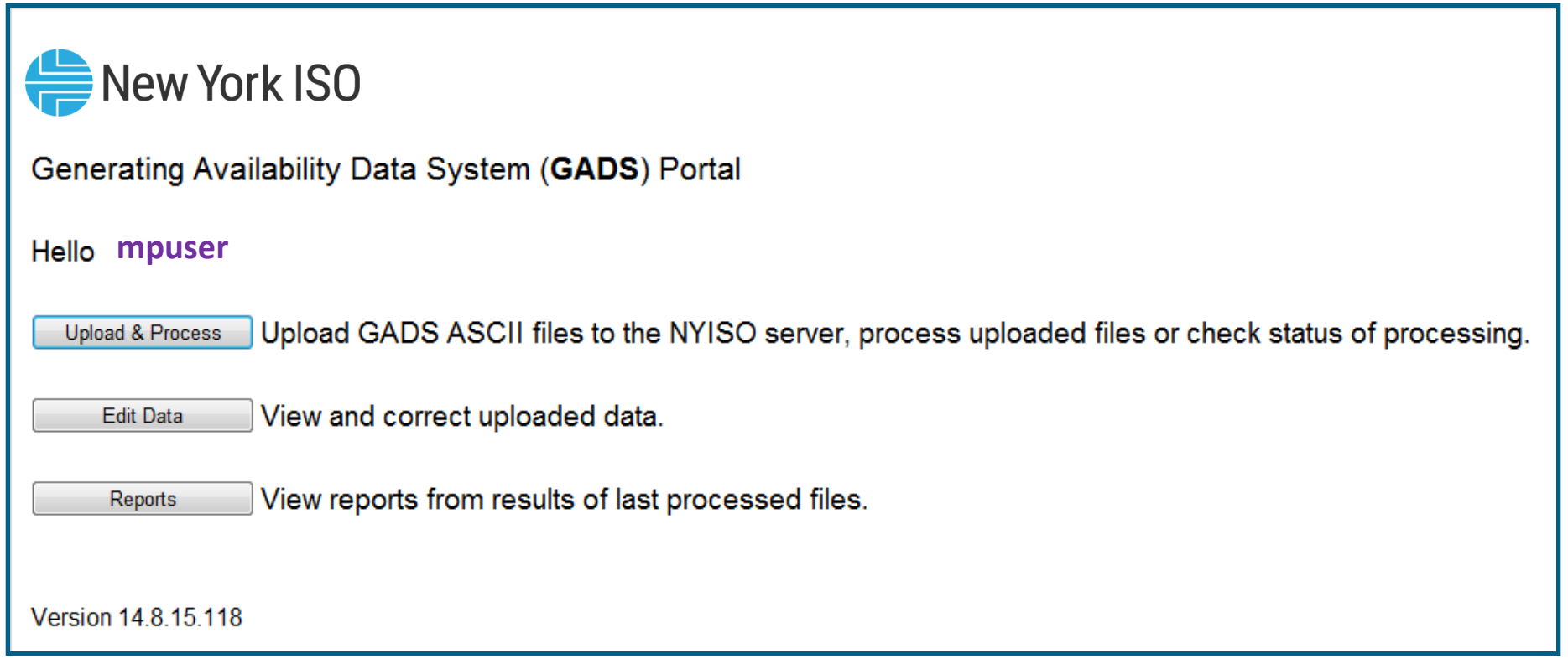
Login Screen



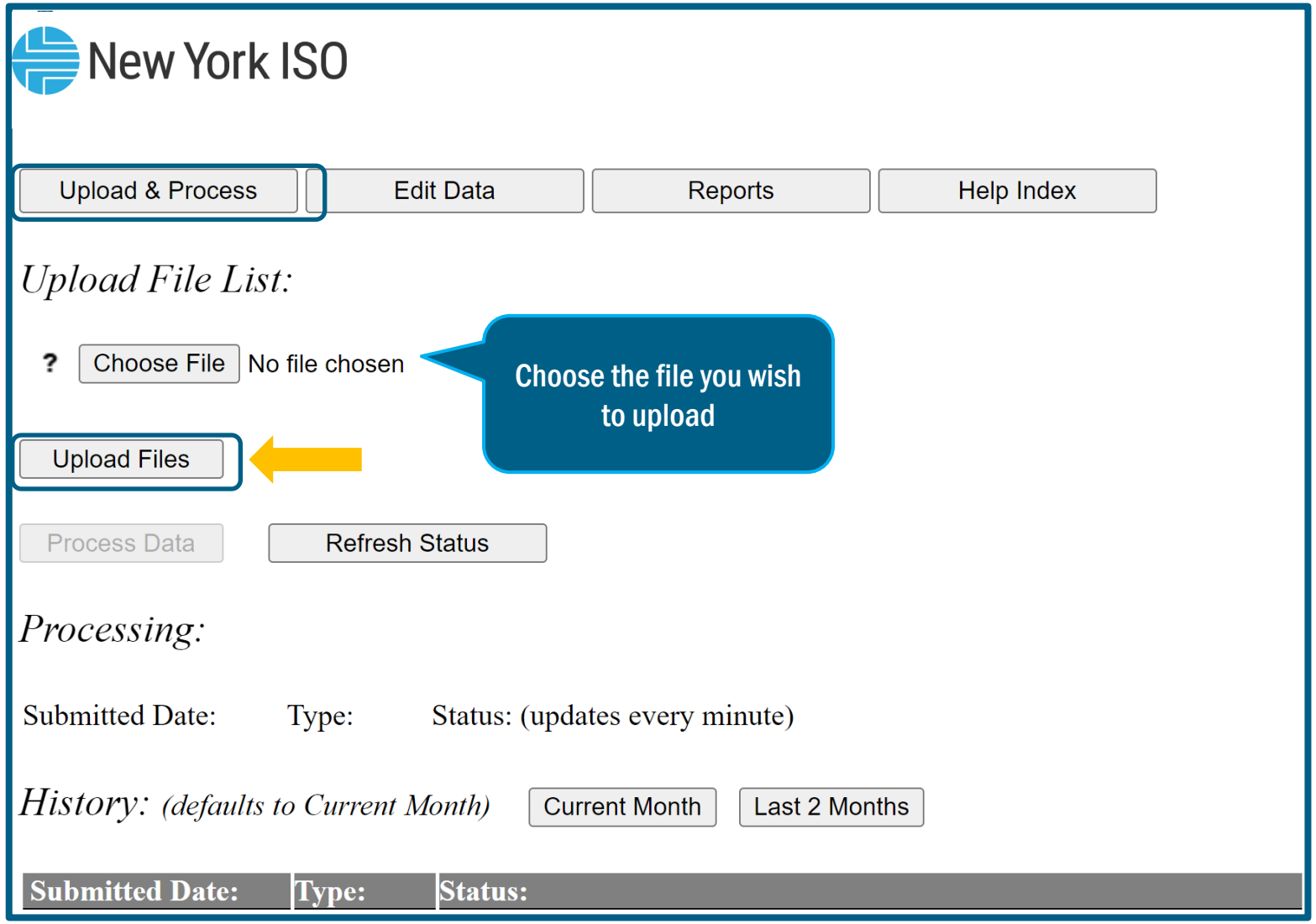
Same as MIS user account if you have one. However, must also request access to GADS Portal.
Please note that the username must be in lowercase letters

Quick link: *https://gads.nyiso.com*

Portal Options



Upload and Process Option



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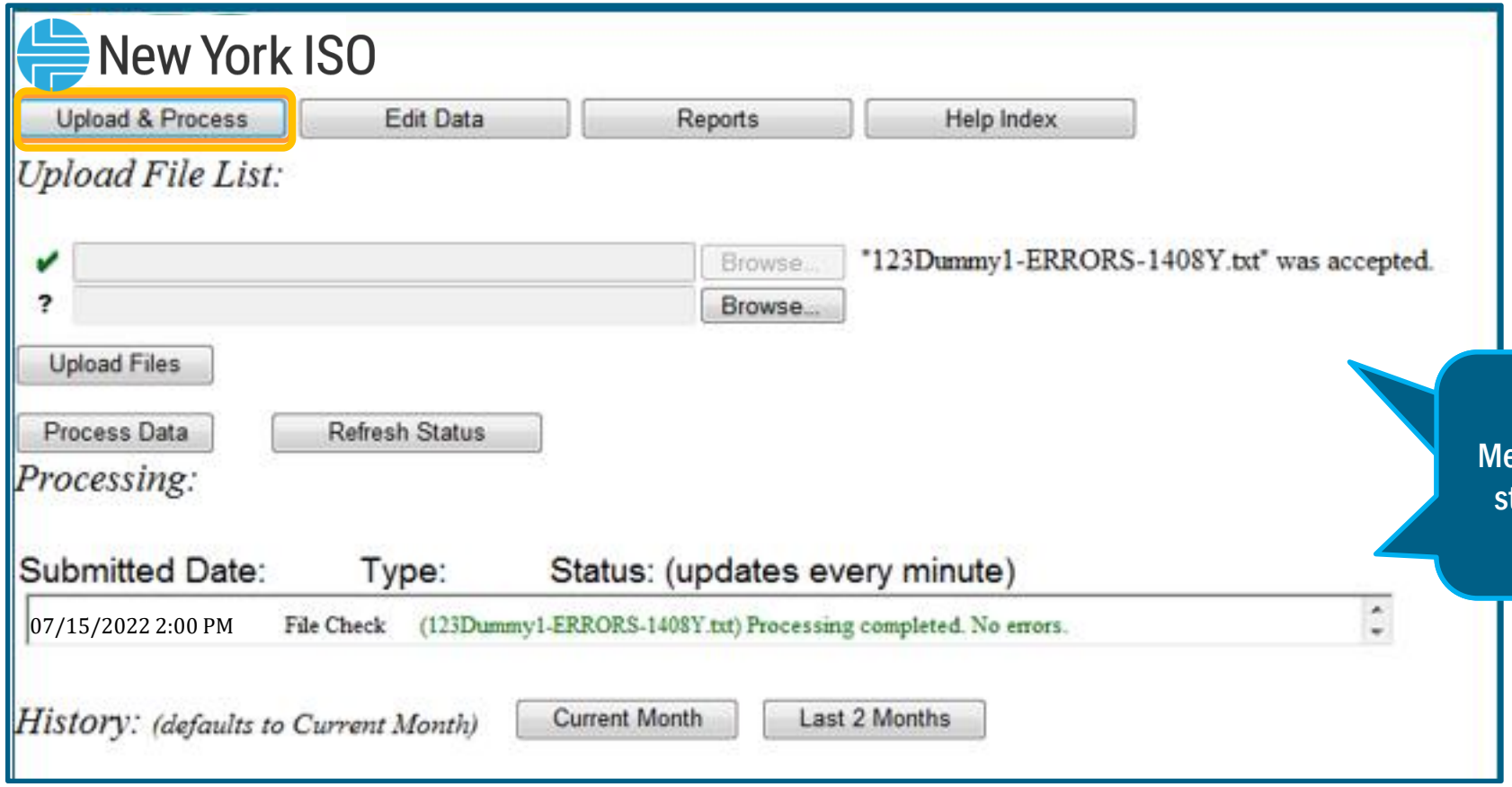
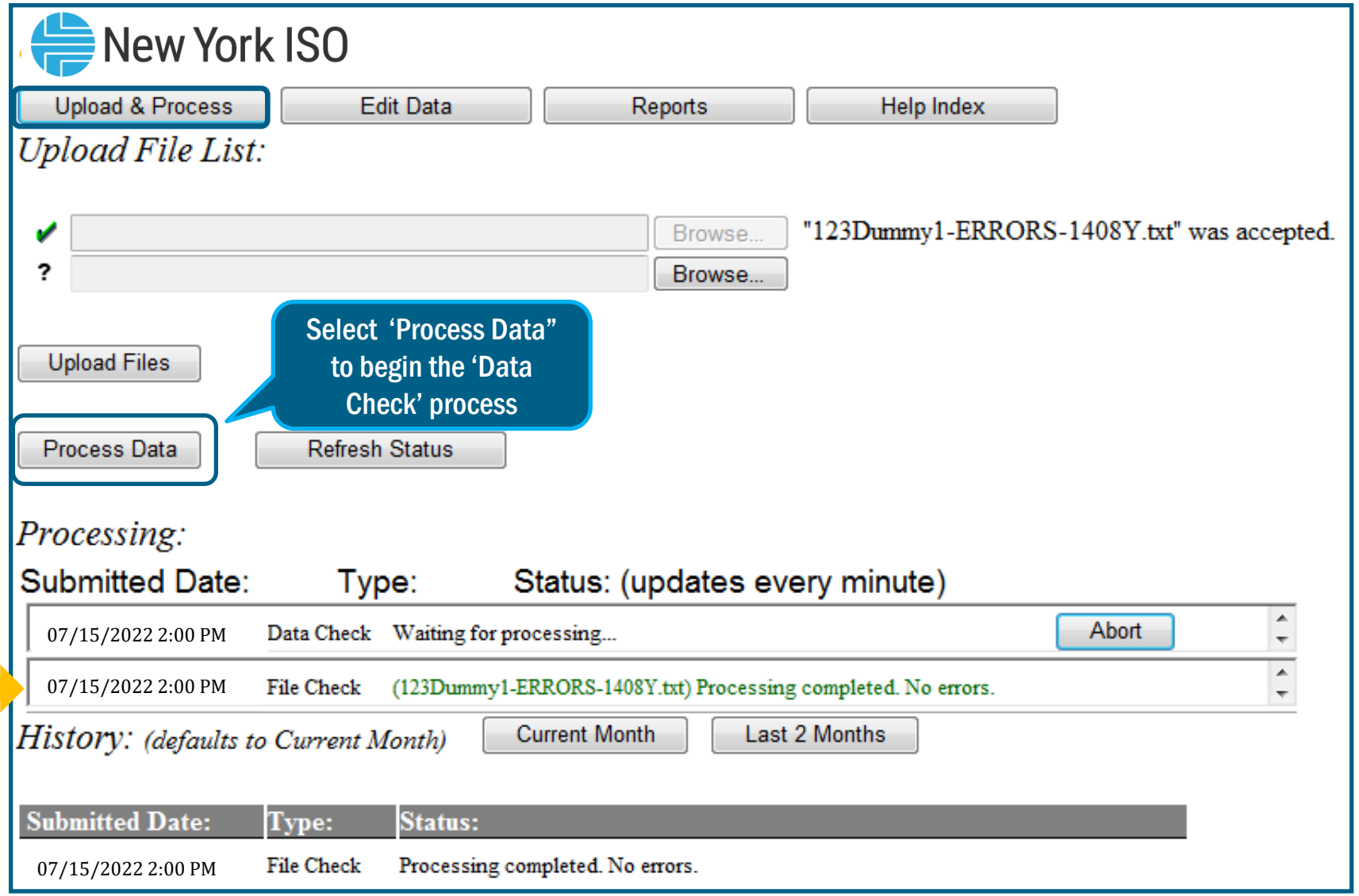
Upload and Process Option



Messages indicating file status of your upload.

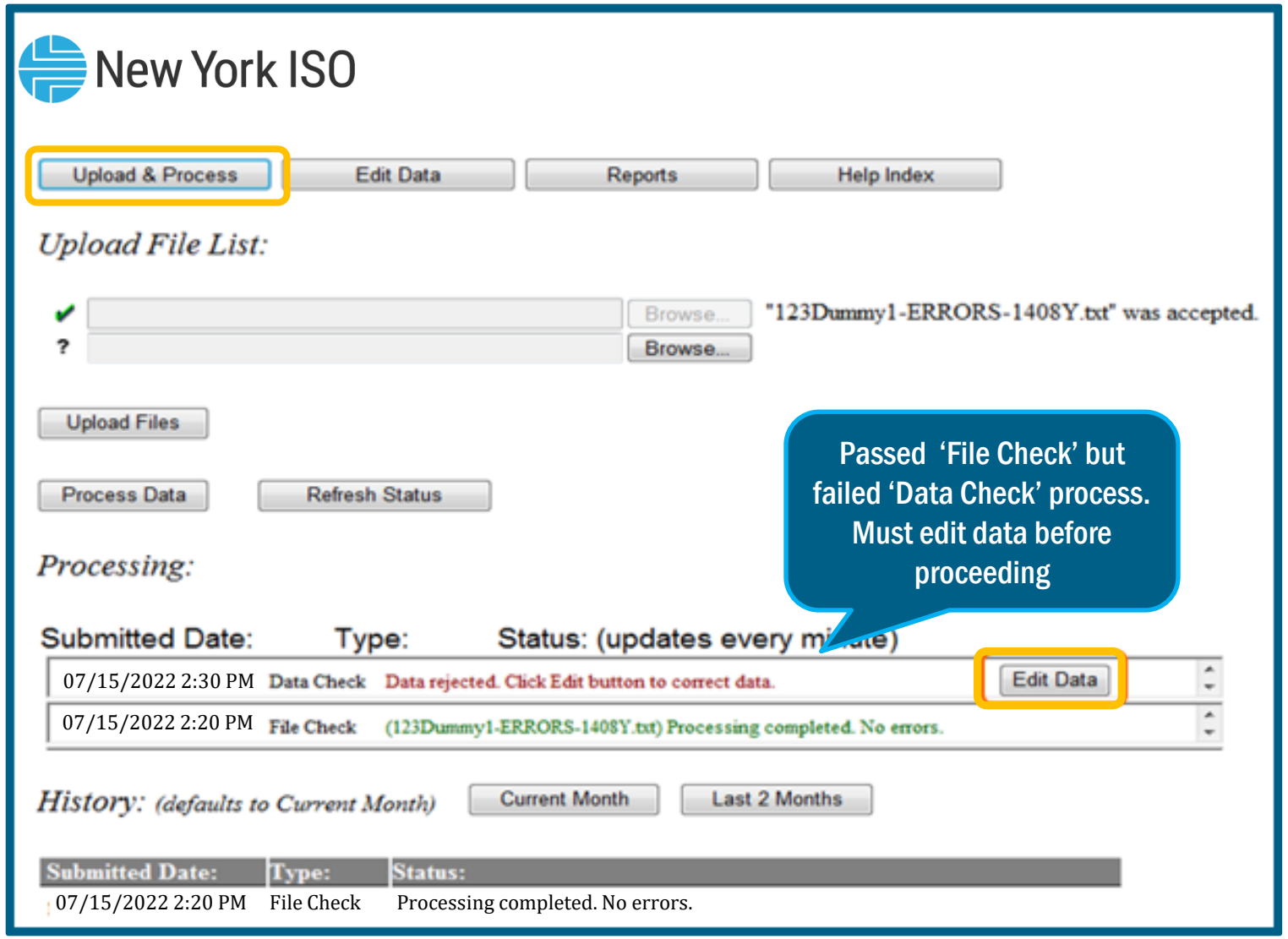
Upload File Option



Upload and Process Phases

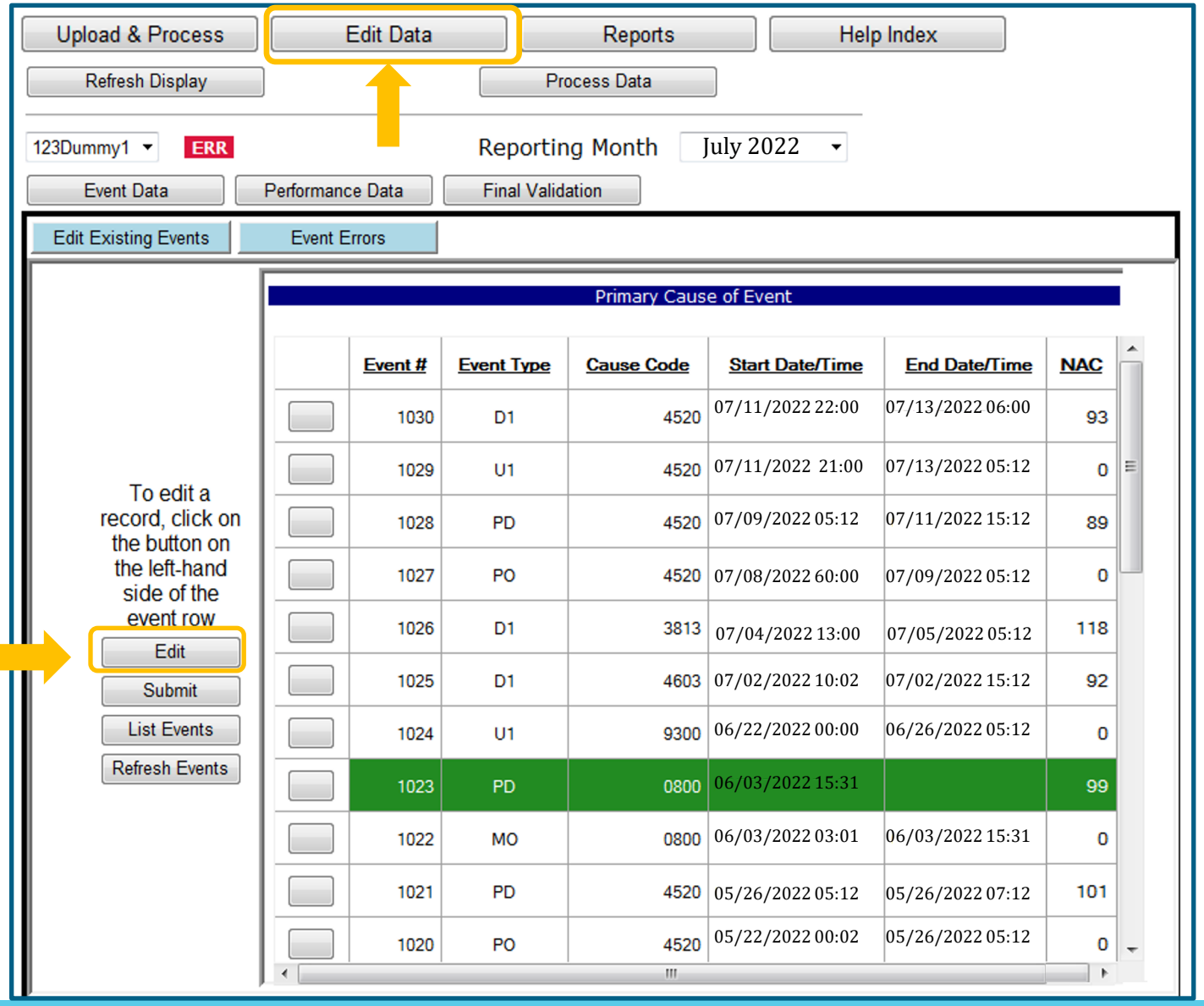
1. File Check	• Proper GADS format
2. Data Check	• Event Data and Performance Data are consistent with one another
3. Analysis	• Detailed check to complete EFORd calculations

Upload and Process Option



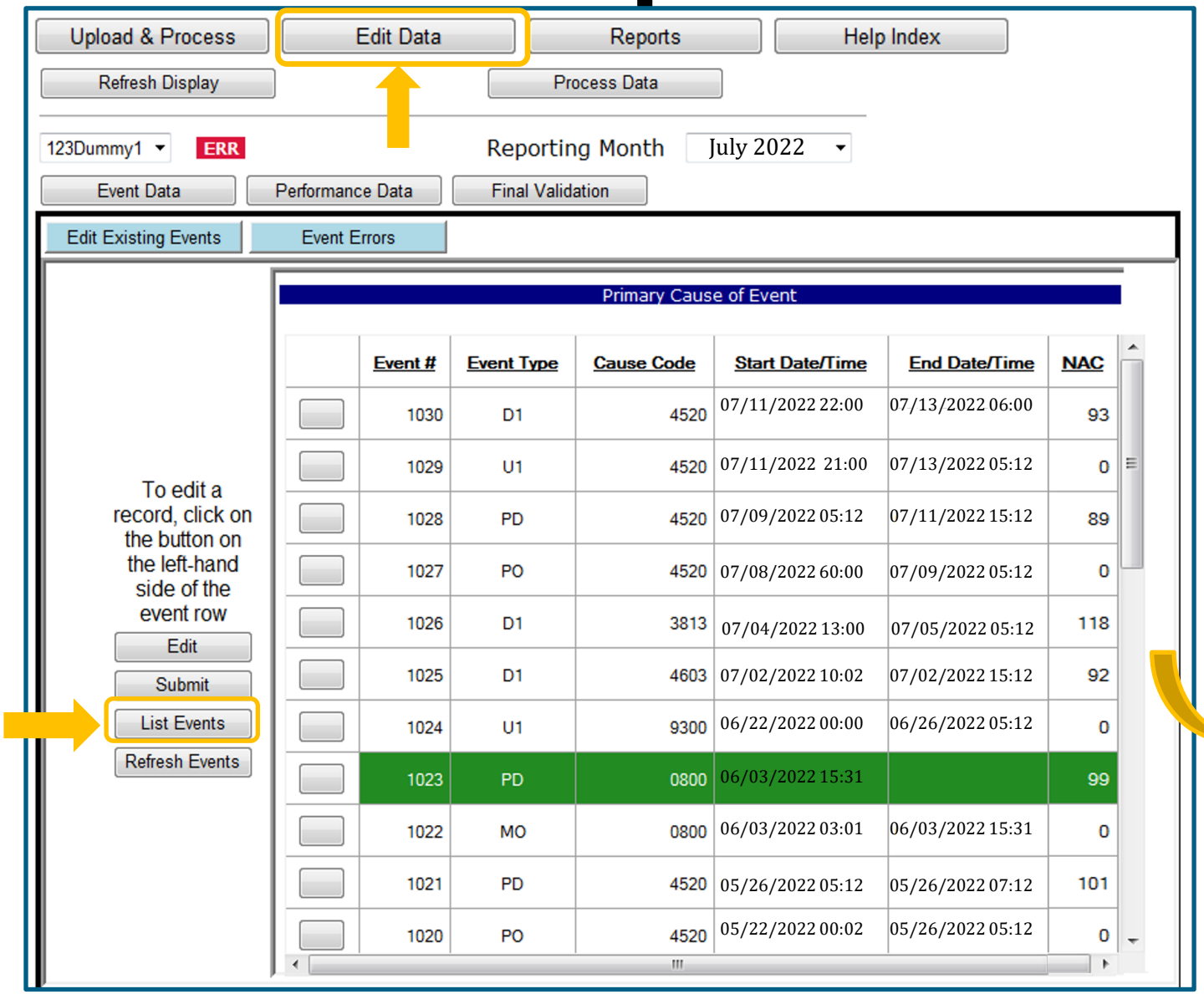
Edit Data Option

List of resources the user is authorized to access

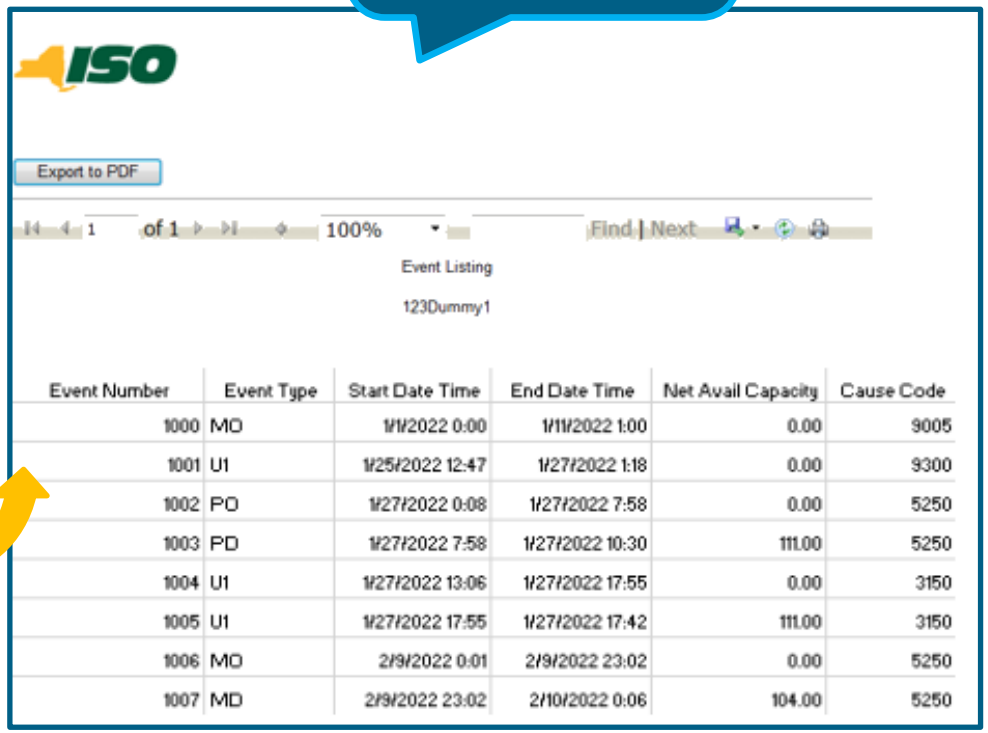


Event #	Event Type	Cause Code	Start Date/Time	End Date/Time	NAC
1030	D1	4520	07/11/2022 22:00	07/13/2022 06:00	93
1029	U1	4520	07/11/2022 21:00	07/13/2022 05:12	0
1028	PD	4520	07/09/2022 05:12	07/11/2022 15:12	89
1027	PO	4520	07/08/2022 60:00	07/09/2022 05:12	0
1026	D1	3813	07/04/2022 13:00	07/05/2022 05:12	118
1025	D1	4603	07/02/2022 10:02	07/02/2022 15:12	92
1024	U1	9300	06/22/2022 00:00	06/26/2022 05:12	0
1023	PD	0800	06/03/2022 15:31		99
1022	MO	0800	06/03/2022 03:01	06/03/2022 15:31	0
1021	PD	4520	05/26/2022 05:12	05/26/2022 07:12	101
1020	PO	4520	05/22/2022 00:02	05/26/2022 05:12	0

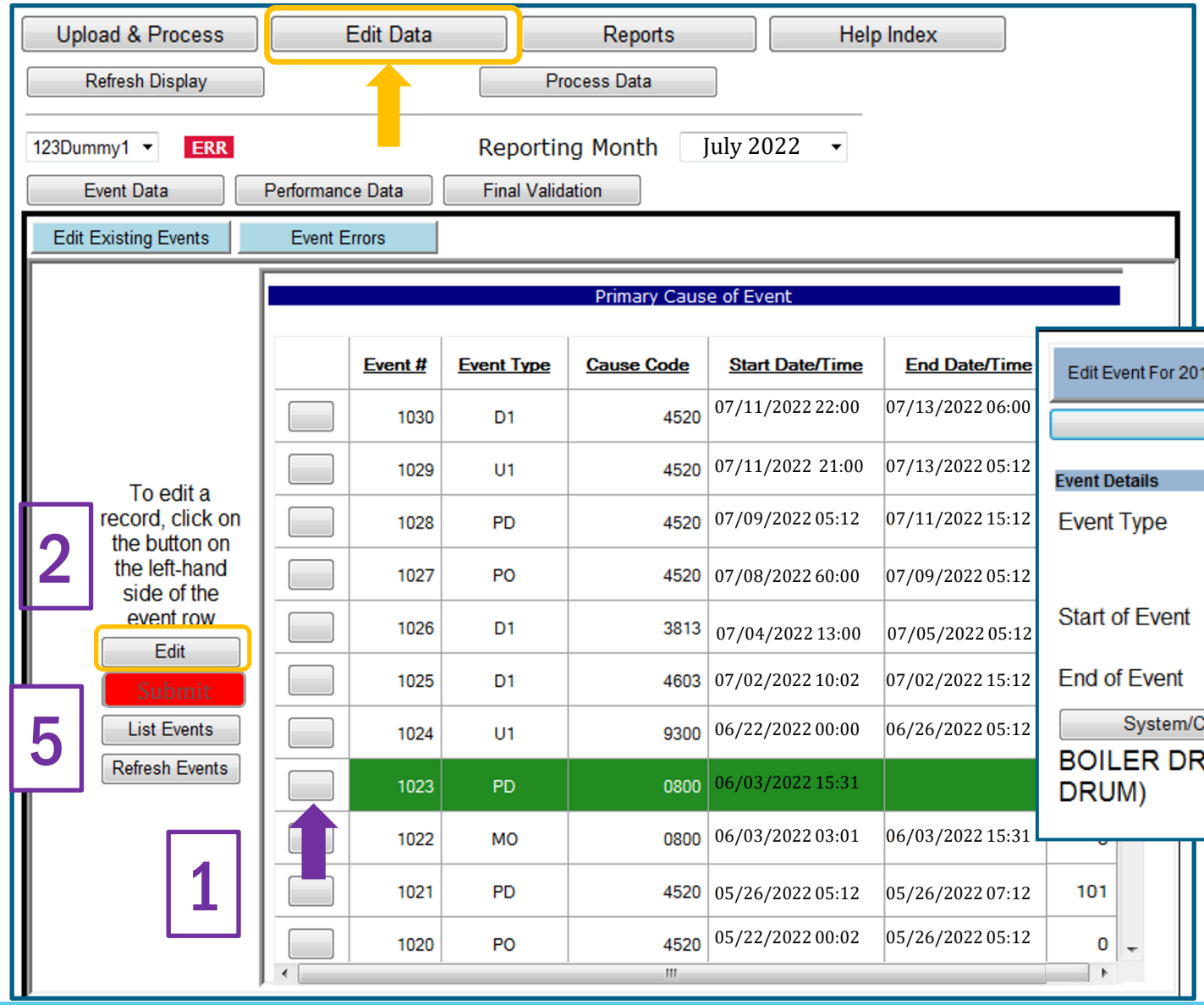
Edit Data Option

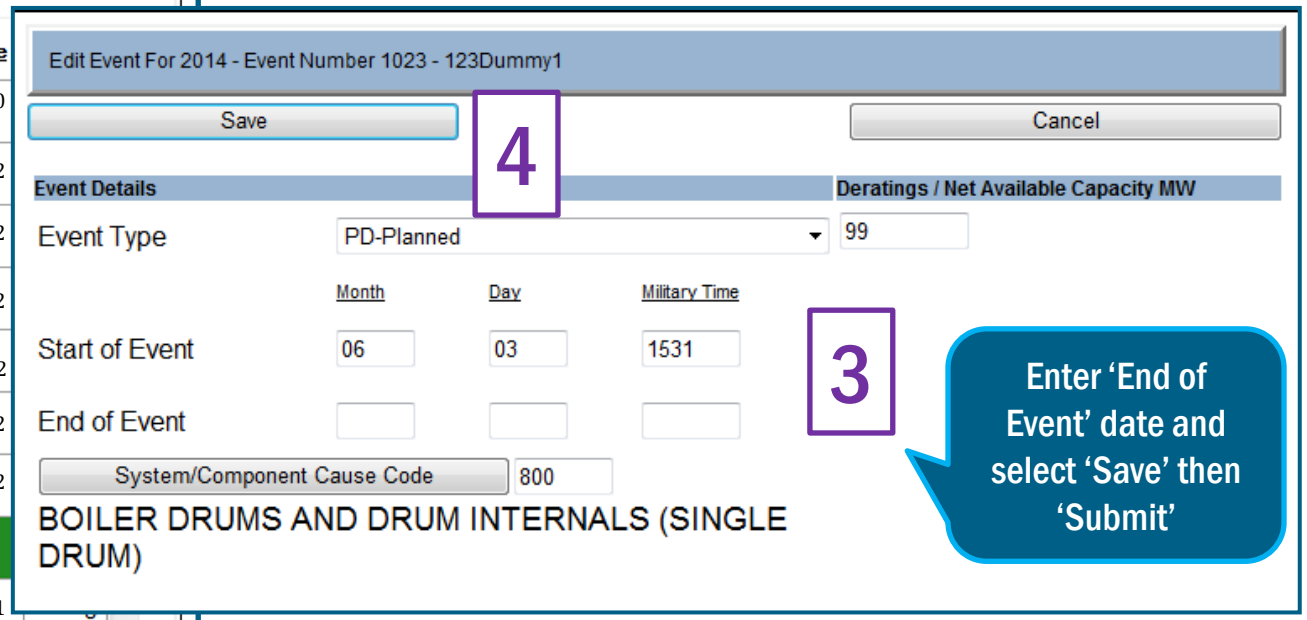


Complete list of Year-to-date events that can then be exported

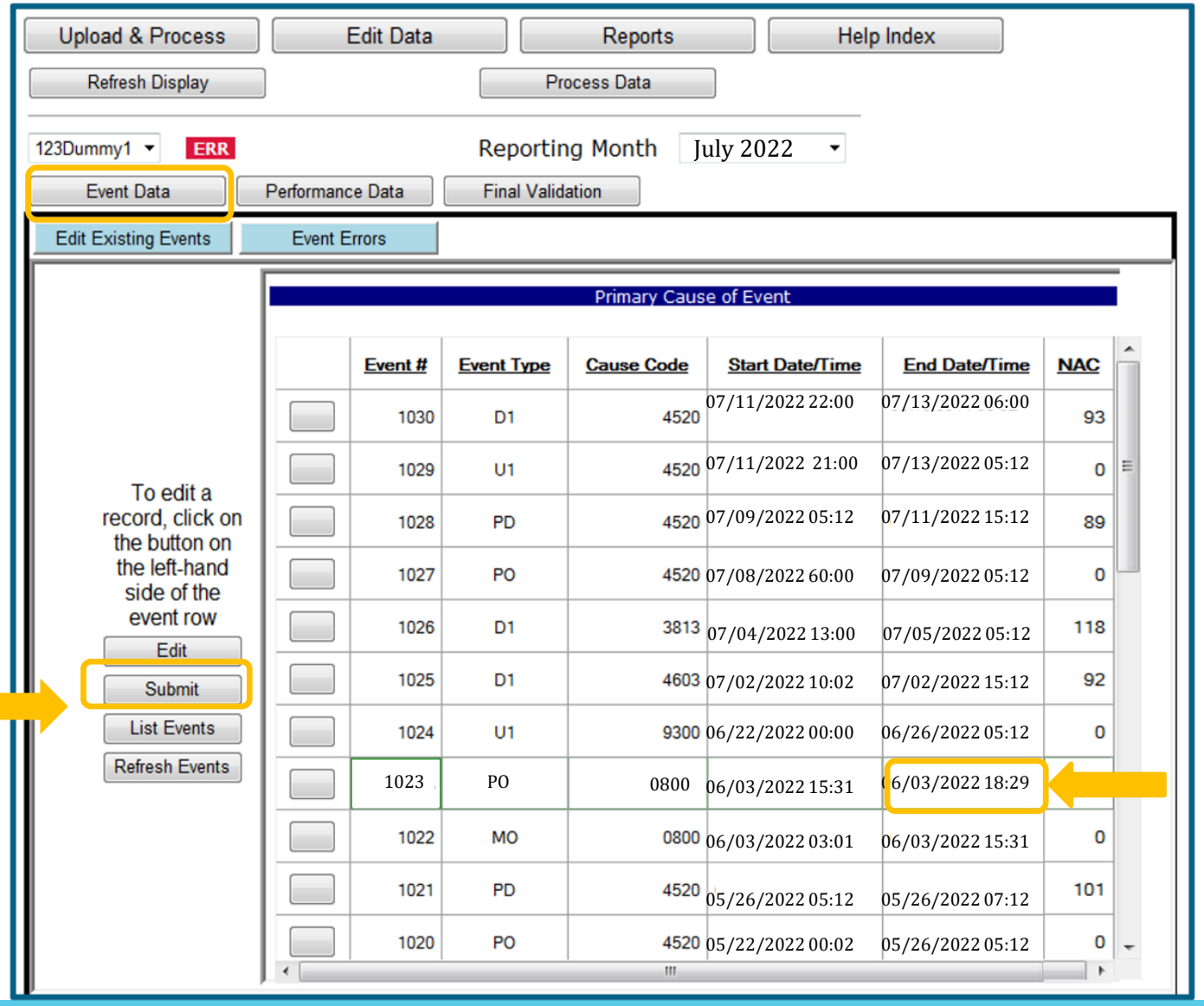


Edit Data Option

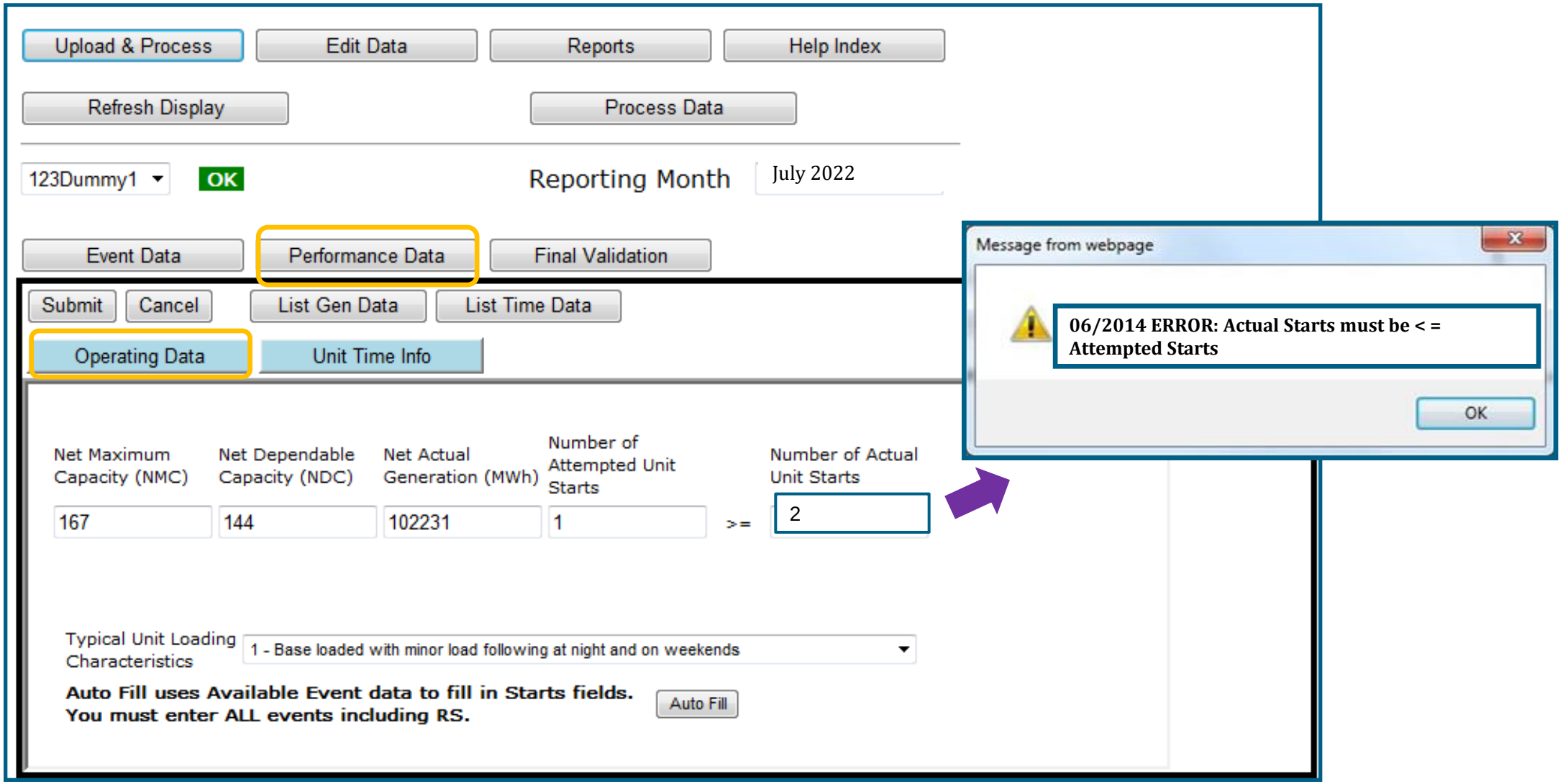




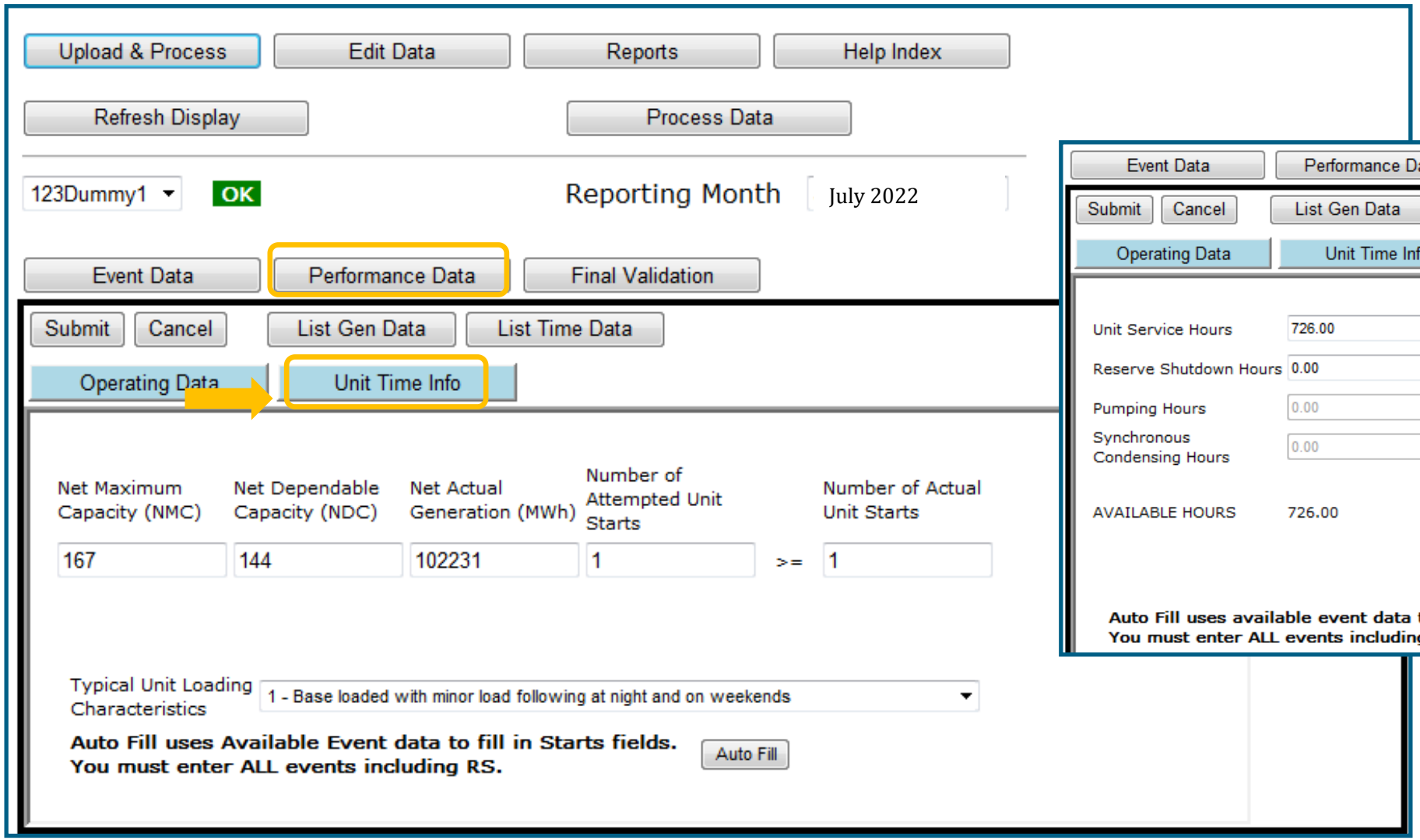
Edit Data Option

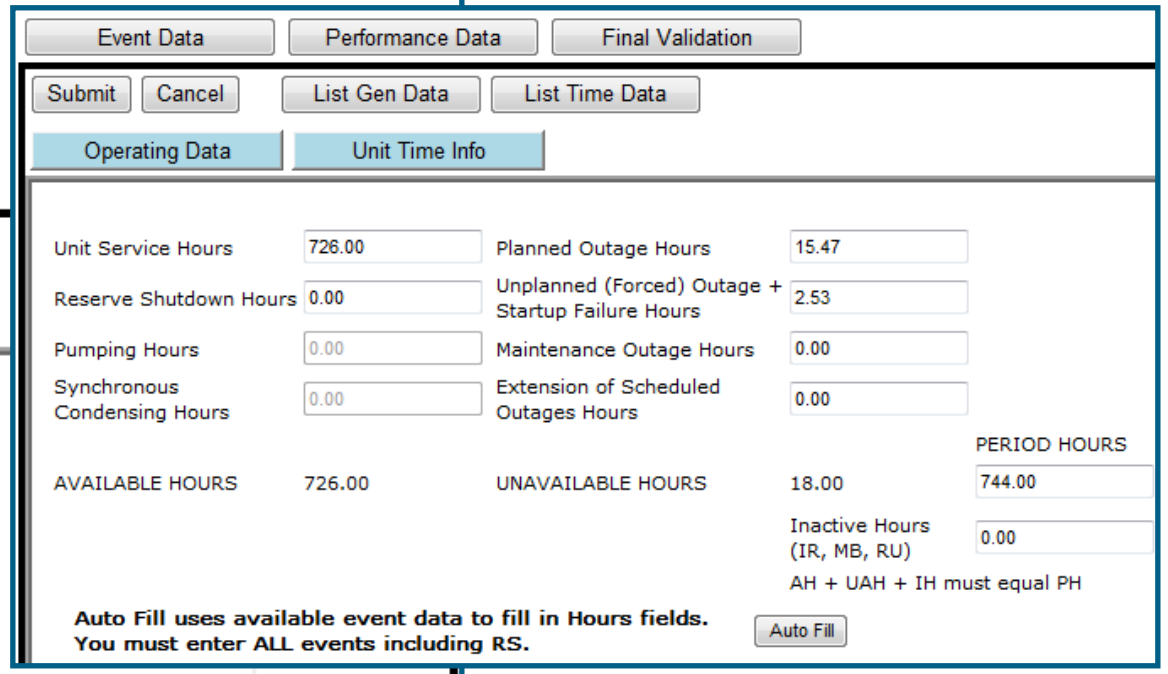


Performance Data

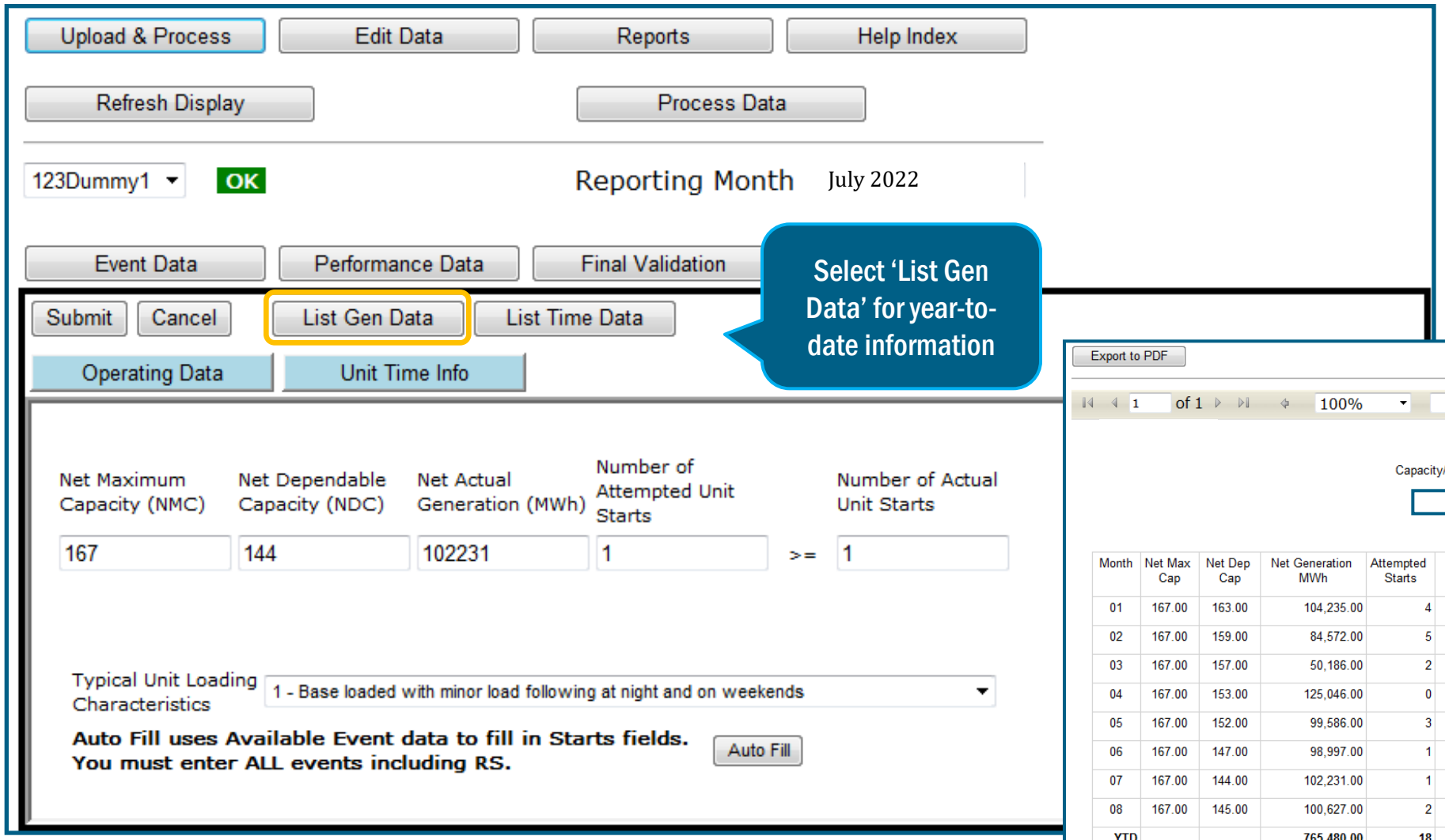


Performance Data





Performance Data



Select 'List Gen Data' for year-to-date information

Export to PDF

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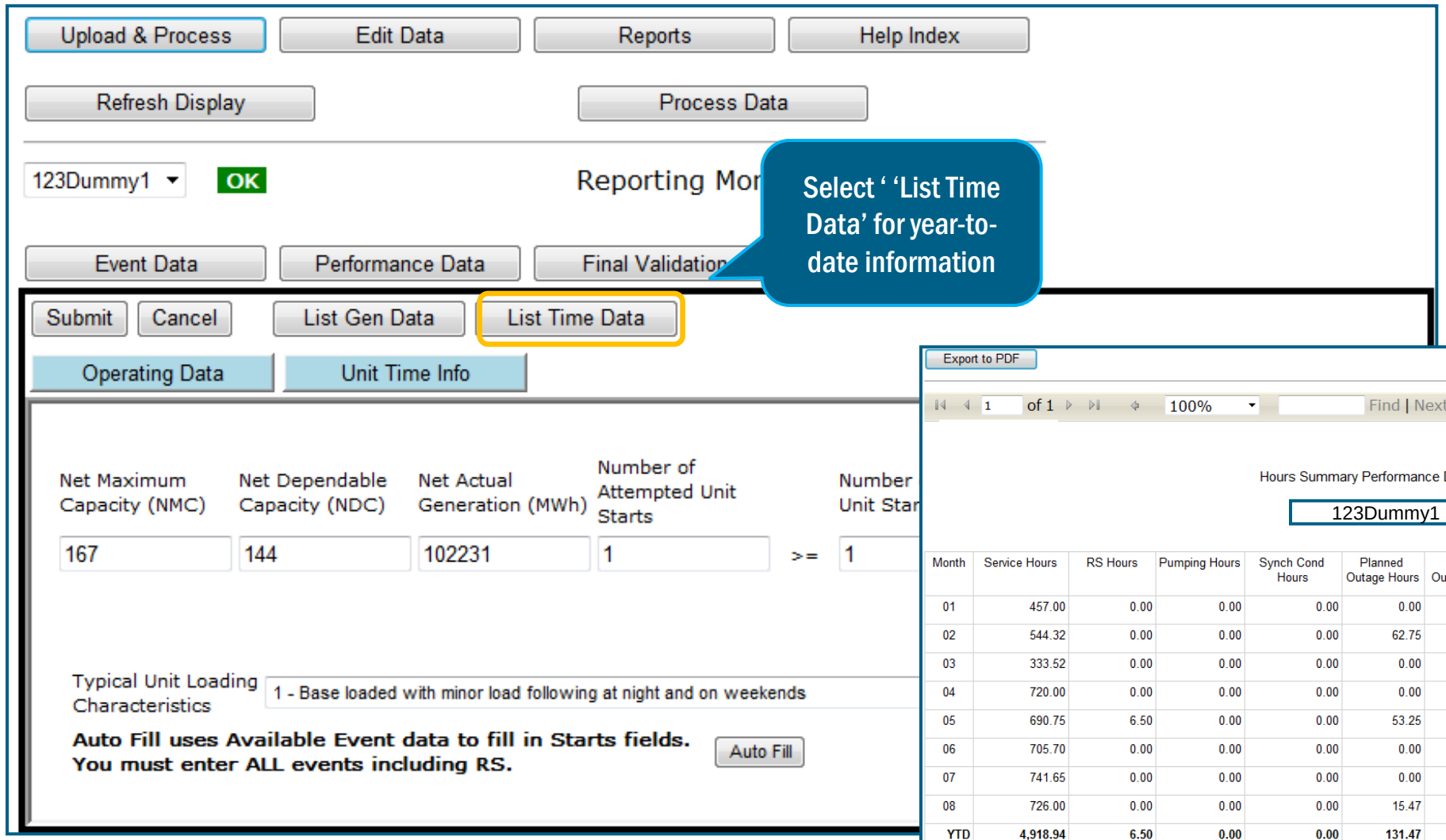
Capacity/Generation/Starts Performance Data

123Dummy1

Month	Net Max Cap	Net Dep Cap	Net Generation MWh	Attempted Starts	Actual Starts	Typical Unit Loading Characteristics
01	167.00	163.00	104,235.00	4	5	1 - Base loaded with minor load-following at night and on weekends
02	167.00	159.00	84,572.00	5	5	1 - Base loaded with minor load-following at night and on weekends
03	167.00	157.00	50,186.00	2	2	1 - Base loaded with minor load-following at night and on weekends
04	167.00	153.00	125,046.00	0	0	1 - Base loaded with minor load-following at night and on weekends
05	167.00	152.00	99,586.00	3	3	1 - Base loaded with minor load-following at night and on weekends
06	167.00	147.00	98,997.00	1	1	1 - Base loaded with minor load-following at night and on weekends
07	167.00	144.00	102,231.00	1	1	1 - Base loaded with minor load-following at night and on weekends
08	167.00	145.00	100,627.00	2	2	1 - Base loaded with minor load-following at night and on weekends
YTD			**765,480.00**	**18**	**19**	

Performance Data



Export to PDF

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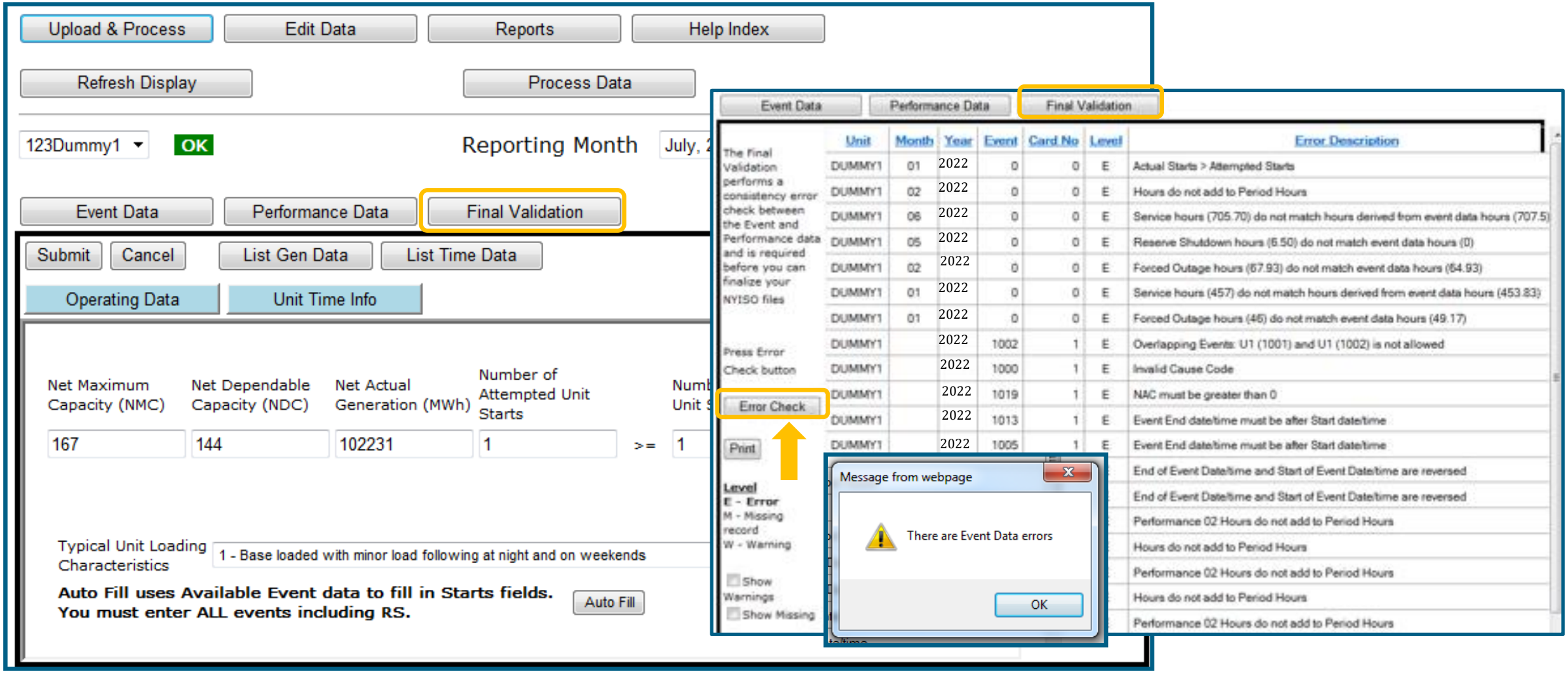
Hours Summary Performance Data

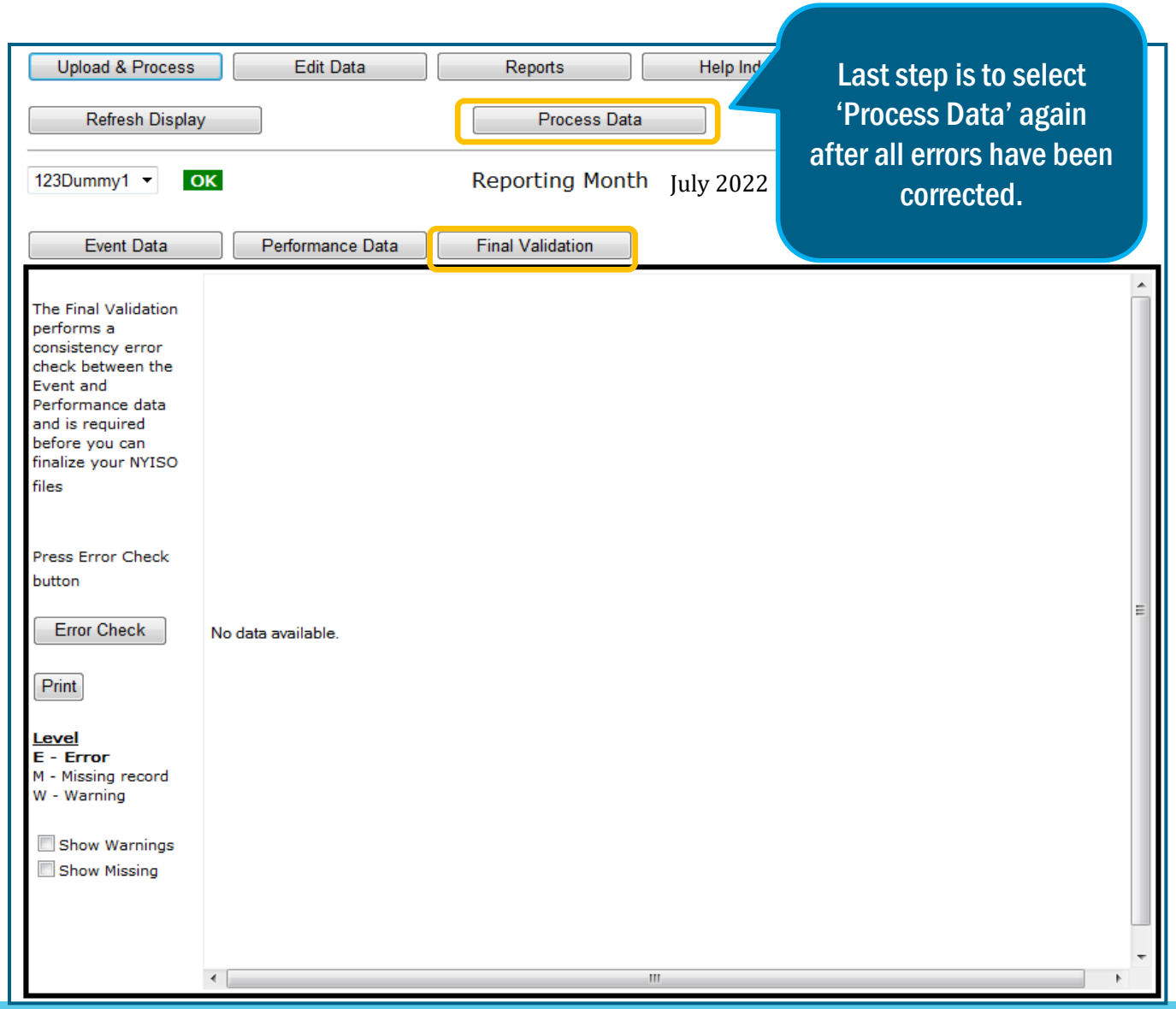
123Dummy1

Month	Service Hours	RS Hours	Pumping Hours	Synch Cond Hours	Planned Outage Hours	Forced Outage Hours	Maint Outage Hours	Ext of Sched Outages	Period Hours
01	457.00	0.00	0.00	0.00	0.00	46.00	241.00	0.00	744.00
02	544.32	0.00	0.00	0.00	62.75	67.93	0.00	0.00	672.00
03	333.52	0.00	0.00	0.00	0.00	409.48	0.00	0.00	743.00
04	720.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	720.00
05	690.75	6.50	0.00	0.00	53.25	0.00	0.00	0.00	744.00
06	705.70	0.00	0.00	0.00	0.00	0.00	12.50	0.00	720.00
07	741.65	0.00	0.00	0.00	0.00	2.35	0.00	0.00	744.00
08	726.00	0.00	0.00	0.00	15.47	2.53	0.00	0.00	744.00
YTD	**4,918.94**	**6.50**	**0.00**	**0.00**	**131.47**	**528.29**	**253.50**	**0.00**	**5,831.00**

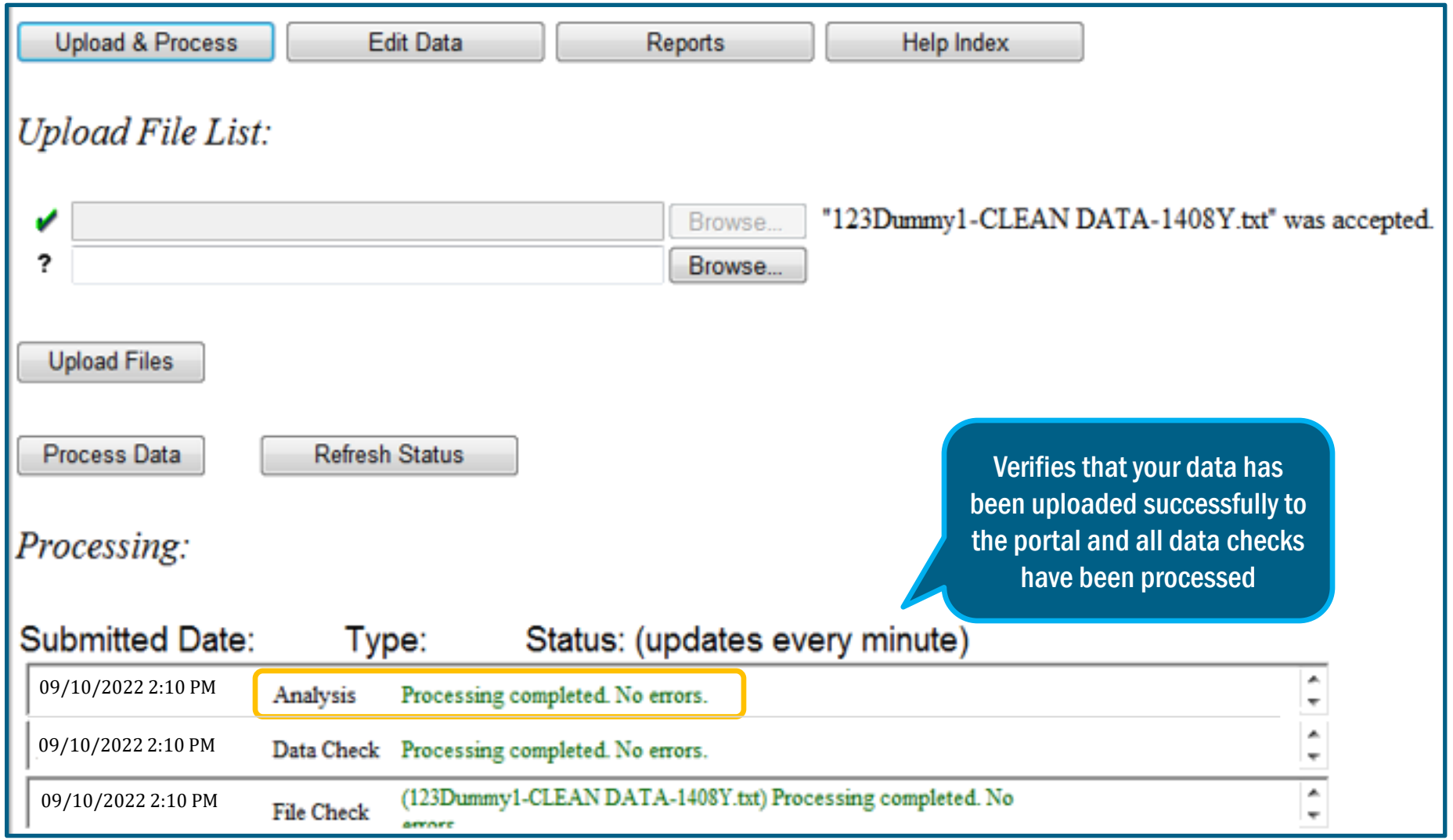
Final Validation



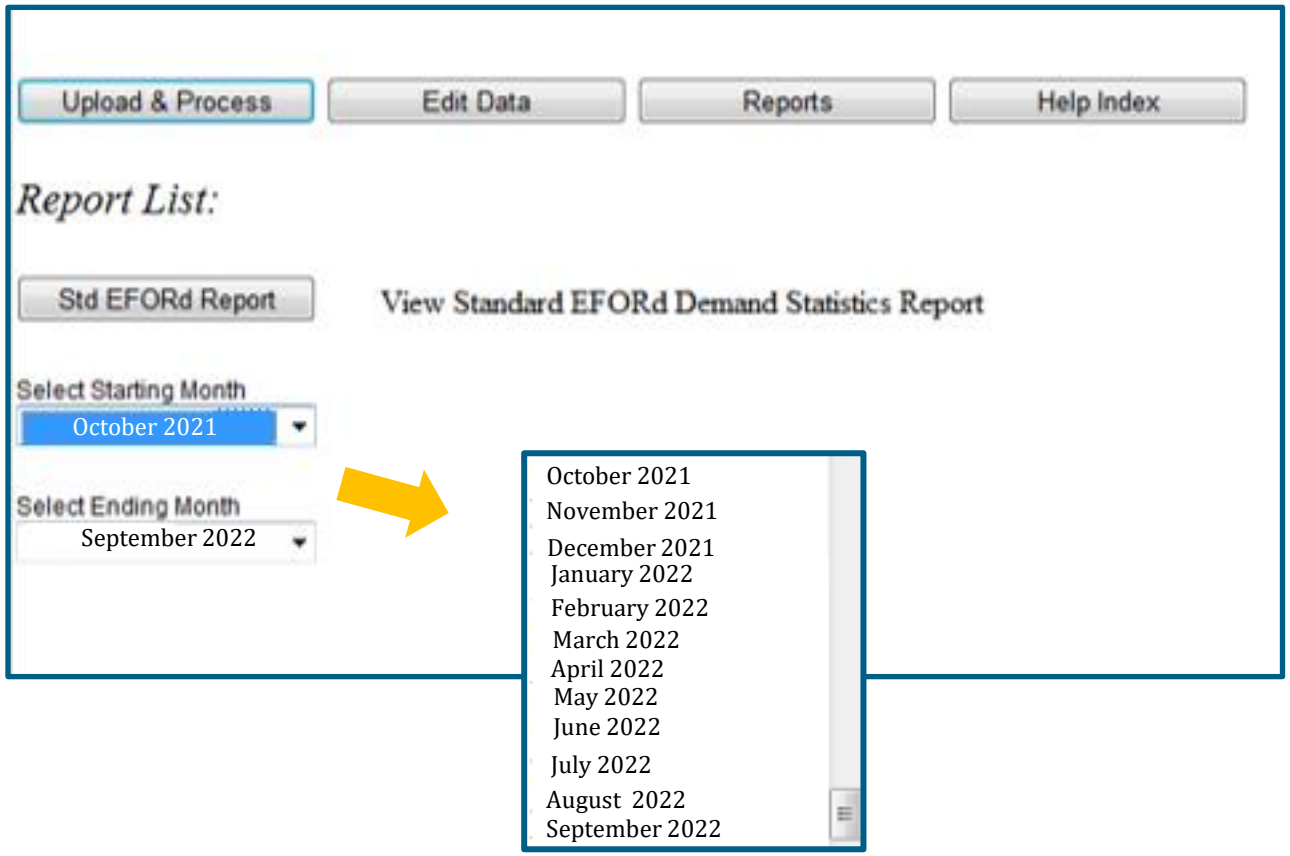
Final Validation



Upload & Process Complete



Report Option



Standard EFORd Report

Export to Excel

Data Exported.

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Unit Name	Month Or Total	Net Actual Generation	SH	RSH	OH	FO Count	EFDH	Attempted Starts	Actual Starts	Starting Reliability	Forced Outage Rate	EFORd	EAF	Net Capacity Factor	Period
123Dummy1	November 2021	103,478.00	720.00	0.00	0.00	0	0.00	0	0		0.00	0.00	88.62	86.06	Nov 2021– April 2022
123Dummy1	December 2021	97,221.00	670.13	0.00	0.00	0	0.00	2	2	100.00	0.00	0.00	83.48	78.25	Nov 2021– April 2022
123Dummy1	January 2022	107,451.00	721.00	0.00	0.00	0	0.00	0	0		0.00	0.00	96.41	89.24	Nov 2021– April 2022
123Dummy1	February 2022	106,510.00	710.00	0.00	0.00	0	0.00	1	1	100.00	0.00	0.00	93.72	85.72	Nov 2021– April 2022
123Dummy1	March 2022	104,235.00	457.00	0.00	9.48	2	0.00	4	4	100.00	2.03	2.03	59.81	83.89	Nov 2021– April 2022
123Dummy1	April 2022	84,572.00	544.32	0.00	62.10	2	0.00	5	5	100.00	10.24	10.24	76.85	75.36	Nov 2021– April 2022
123Dummy1	TOTAL	603,467	3822.45	0.00	71.58	4	0.00	12	12	100	2.05	2.05	83.14	83.08	Nov 2021– April 2022

Summary of Process

1. Upload file
2. Correct errors through portal directly or User's file and resubmit file
3. Select 'Submit' each time you make a correction directly in the portal
4. Select 'Process Data' one last time to commit the corrections to the NYISO's GADS database

Note: All on-line corrections or edits should also be performed in the User's GADS database, so the change is retained for the next upload

Important Reminders

- System times out after about 30 minutes due to inactivity
- Select ‘Submit’ frequently because if the system times out prior to selecting the “submit” button, all data entered in that session will be lost 

- Submit only Year-to-date data
- All on-line corrections or edits should also be performed in the User’s GADS database

Additional Resources

- MST Tariff
- ICAP Manual
- ICAP Manual Attachments
- Outage Scheduling Manual
- GADS FAQs

Generating Availability Data System (GADS) as Used Under NYISO Rules Chapter 6

Mathangi Srinivasan Kumar
Market Training Program Administrator, NYISO

E-Learning Suite

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. After completing this training, please direct any GADS related inquiries to GADS_info@nyiso.com

Chapter 6: Generator Outage Scheduling with the NYISO

Generator Outage Scheduling

***

- All Resources located in the NYCA or supplying ICAP to the NYCA must submit a confidential notification of their proposed outage schedule to the NYISO
  - All requirements for Generator Operators operating generating units shall apply to Aggregators operating Aggregations that include at least one generating unit
- Generator Outage Basis for Coordination
  - "Coordination of outage schedules is desirable in order to limit the severity of impact" (NPCC, 1997)
    - Impact on NYCA
      - Maintaining NYCA system reliability
    - Impact on Neighboring Control Areas
      - Receiving or Rendering assistance to a neighboring area
        - » Outages reduce ability to contribute to the reliable operation of interconnected system

Outage Scheduling Process

- Submittals
  - Annual Maintenance
    - Requirements
    - Methods
    - Updates
  - Impending Scheduled Outage
    - Requirements
    - Methods
  - Unscheduled and Unplanned Outages
    - Requirements
  - Notification Upon Actual Outage

Outage Scheduling Process

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

Resource Name (as listed in MIS)	Transmission Owner Area
Unit Point Identifier (PTID)	Reason for Outage
Size of the unit (MW)	Date and Time of start of the Outage
MWs unit is derated to	Date and time of outage completion
Resource operator company name	Contact information of person reporting outage

Outage Scheduling Process

***

- Submittal Methods
  - Manual Submittal: E-Mail, Telephone
  - Automated submittal: OMS entry, CSV Upload, GOCP entry
- Updates to two-year projections:
  - Resource owner/Aggregator requesting outage schedule update
    - Can update as needed through OMS
  - Resource owner/Aggregator requesting cancellation of scheduled outage
    - Must submit justification for cancellation
      - Reviewed by NYISO Operations and Market Mitigation & Monitoring

Outage Scheduling Process

***

- Impending Scheduled Outage
  - Units 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
    - NYISO must receive at least two (2) calendar days notice of a Maintenance Outage (MO) or Maintenance Derating (D4)
  - Outage requests approved in order received as long as local TO approves and no reliability violation exists
  - Submittal Requirements and methods same as Annual Maintenance Schedule submittal

Outage Scheduling Process

- <u>Unscheduled and Unplanned Outages:</u>
  - 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

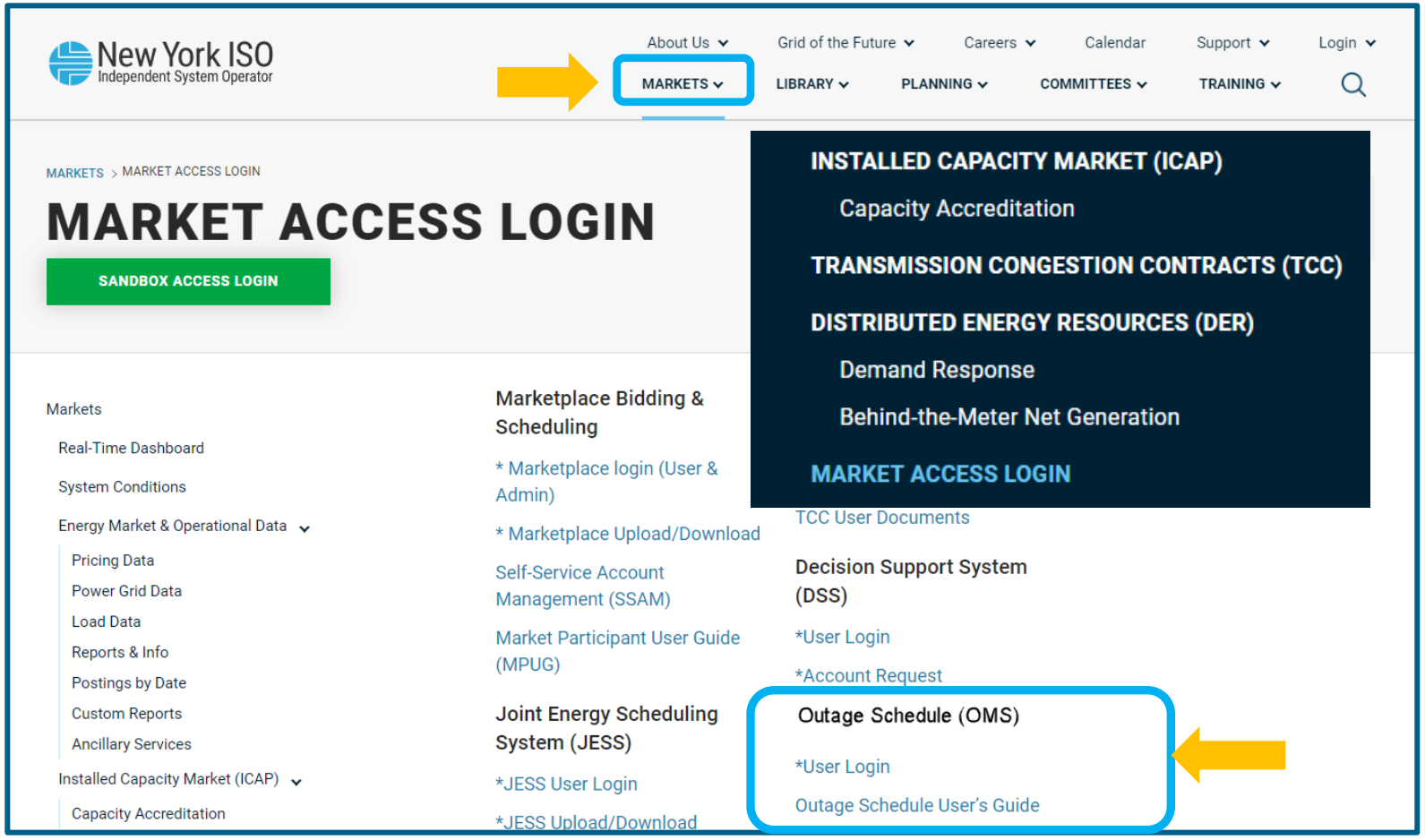
Outage Scheduling Process

***

Notifying NYISO Upon Actual Outage		
Implementing Approved Scheduled Outages:	**Unscheduled unit outages (full or partial):**	**Forced unit Outages (full or partial):**
• Contact NYISO Generation Operator Desk • Await NYISO and TO authorization	• Contact NYISO Generation Operator Desk • Report reason & estimated duration • Await NYISO authorization • NYISO will coordinate new schedule is needed	• Inform NYISO and TO as soon as possible • Report reason • Report estimated duration (and/or return to service) • Update MIS bids

Outage Scheduling Application

- Manage Outage Scheduling submissions through the Outage Management System (OMS) and the Grid Operations Coordination Portal (GOCP) ***



Outage Scheduling References

***

- NYISO Outage Scheduling Manual
  - Sections 3 & 4
- Outage Scheduler User Guide
- GOCP User's Guide
- NYISO Installed Capacity Manual
  - Section 4
- Aggregation Manual
  - Section 2
- NPCC Document C-13
  - Operational Planning Coordination
- Market Services Tariff
  - Section 5
- NYISO Generation Scheduling Desk
  - Telephone: 518-356-6050
  - Email: genplan@nyiso.com
- OMS Generator Owner Outage Scheduling

Chapter 7: Event Type Reporting - Scenarios

Event Scenarios: Directions

- These are interactive!
- Multiple Choice Questions:
  - Please click on the appropriate box to chose the correct answer
  - If you choose an incorrect response, please click on Try Again, to chose another answer

Note: There is no audio beyond this slide in this chapter

Scenario 1

We have detected a boiler tube leak 4 days before a scheduled Planned Outage (PO).
The repair time is 106 hours.
The unit must come down within 6 hours of notification and cannot stay online until the start of the PO.

How should we classify this outage?

- Planned Outage
- Forced Outage
- Maintenance Outage

Forced Outage

This is correct!

The event will be classified as a Forced Outage for the106 hours required to fix the tube leak, and then change to a Planned Outage.

Done!!!

Alarms indicated vibration on unit's #1 ID Fan on Tuesday 10 a.m.

The unit could stay online until the next Monday, but NYISO Operations authorized and approved an outage for Friday morning.

<u>How should we classify this outage?</u>

Scenario 2

Planned Outage

Forced Outage

Maintenance Outage

Maintenance Outage

This is correct!

The unit gave two days notification and taking the unit down caused no reliability issues for Operations.

Done!!!

Scenario 3

Our Combined cycle unit had a Heat Recovery Steam Generator (HRSG) tube leak.
NYISO Operations said the unit was not needed for remainder of week.
Management decided to repair the unit on regular maintenance time.
It took 12 hours of work to repair the HRSG over a 36-hour period.

<u>How should we report this outage?</u>

Forced Outage

Reserve Shutdown

Forced Outage

This is correct!

The unit will be in Forced Outage for the full 36 hours it takes to repair the tube leak and is inoperable.
Then the unit will transition into Reserve shutdown again.

Done!!!

Scenario 4

During a 4-week PO, we discovered that the repairs on the Electro-Static Precipitator (ESP) were more extensive than planned.
At the end of 4th week, the ESP work was not completed as outlined in the original scope of work.
3 more days were required to complete the work.

How should we report the additional 3 days of work?

Forced Outage

Planned Outage

Planned Outage Extension

Planned Outage Extension

This is correct!

The repairs done were for a part/component that was part of the original scope of work for a Planned Outage, that required an additional 3 days to complete.

Done!!!

Scenario 5

During a 4-week PO, our mechanics discovered a Boiler Feed Pump (BFP) packing needed replacement (not part of scope of PO).

At the end of 4th week, the BFP work was not completed due to no parts on site.

There was a 12-hour delay in startup to complete work on BFP.

<u>What type of outage would the extra 12 hours be?</u>

Maintenance Outage

Planned Outage

Forced Outage

Forced Outage

This is correct!

The BFP package replacement work done in the 12 hours was not part of the original scope of work for the Planned Outage.
The work done in the 12 hours delayed start-up.

Done!!!

Scenario 6

During a 4-week PO, our mechanics discovered that the Induced Draft fan blades needed replacement
This was outside the scope of the PO.
Parts were ordered and the ID fan was repaired within the 4-week period of the PO.
There were no delays in startup.

How should we report this?

Outage remains Planned Outage (PO)

Outage changes from PO to FO and back to PO

Outage remains Planned Outage (PO)

This is correct!

Even though replacement of the fan blades were out of the original scope of work, work was completed within the scheduled PO time.

Done!!!

Scenario 7

Our small fossil unit experienced a Forced Outage failure in its boiler.
However, the unit was not needed the remainder of the week.
Management decided to repair the unit on standard work time, w/o overtime or weekend hours.
Working standard 8-hour days, the repairs were completed with 12 hours over a day and a half (36-hour) period.

How should we report this?

Reserve Shutdown

Forced Outage

Forced Outage

This is correct!

Although the unit was not needed, the unit was not available for 36 hours and so the Forced Outage is reported from the time the unit came offline until the unit was available for operation (36 hours later).
The RS time starts after the repairs are completed and unit is available for operation and still not needed.

Done!!!

Scenario 9

On Wednesday, Jan. 20, the Transmission Owner notified us (The Gen Owner) and the NYISO that the output transmission lines for their generating facility will be taken out-of-service for repairs on Tuesday, June 1, and will remain inactive for 1 week; returning to service on Tuesday, June 8.

We have begun preparing for the outage.

How should we report this?

Planned Outage

Forced Outage

Forced Outage

This is correct!

This outage will be entered as a U1 (Unplanned/Forced Outage-Immediate) with the Cause Code 9300 (transmission system problems other than catastrophes).
For ICAP market purposes, the outage will not be included in the calculation of EFORd.
For reliability purposes this outage will be treated as a full forced outage.

Done!!!

Scenario 10

On Monday, July 20, the local water district notified us (the generator owner) that the water line used by our facility will be taken out of service for upgrades on Tuesday, August 11, and will not return to service for 5 days.
This is the only source of cooling water at our generating facility.
We have begun preparing for the outage.

How should we report this?

Planned Outage

Forced Outage

Forced Outage

This is correct!

Since the generating facility does not have a redundant source of water for cooling, the loss of the water line will force the generating facility offline.
This outage will be entered as a Forced Outage with the Cause Code 9137 (ground water or other water supply problems).

Done!!!

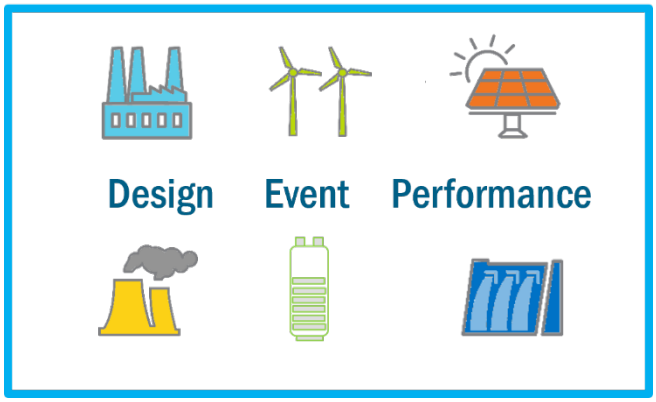
Additional Resources

- MST Tariff
- ICAP Manual
- ICAP Manual Attachments
- Outage Scheduling Manual
- GADS FAQs

Frequently Asked Questions (FAQs)

New York ISO

Generating Availability Data Systems (GADS) Data Reporting to NYISO



1. How often must GADS Data be submitted?

Data must be submitted in a YTD format, and the previous months event and performance data is always due by the 20th of the current month. Come February 20th all open events from the previous year must be closed and recreated in the new year.

2. How must Net Dependable Capacity (NDC) and Net Maximum Capacity (NMC) for a unit be reported?

The unit's Net Dependable Capacity (NDC) should be represented by the DMNC effective for that month, while the Net Maximum Capacity (NMC) is defined in the ICAP Attachment page HH, "The gross power level that a unit can sustain during any period of time when there is no equipment, operating or regulatory restrictions and after adjusting for station service and auxiliary loads and ambient conditions. Average ambient temperature should reflect the average of the daily high temperatures for the month at the plant location."
Only one Net Dependable Capacity for each Resource shall be reported for each month. That value may be either the Resource's DMNC for the Capability Period containing that month or that Resource's average Net Dependable Capacity for that month, at the discretion of the owner of the Resource."
NDC must be less than or equal to the unit's NMC.

3. How must a unit report fuel (gas) unavailability in GADS?

A unit must report fuel unavailability as a Forced Outage (U1, U2 or U3) with the appropriate cause code. Fuel unavailability cannot be reported with a 9300-cause code.

4. If the unit is already on a maintenance outage and is further derated, does the derate have to be reported as well?

Yes, NYISO uses data about unit outages and derates in studies and analyses that ensure there is enough capacity to meet reserve requirements in New York. Therefore, derates of all kinds, whether Planned, Forced or Maintenance should be reported in the GADS data, even if it takes place simultaneously with an outage.

5. Why would a maintenance request with less than two days' notice be denied if the load was low, and if the unit was not needed?

Generator outage requests require both Local Transmission Owner (TO) and NYISO approval. The minimum 2-days' notice is required to provide enough time to evaluate the impacts of the outage by both entities. If 2-days advance notice is not provided, a thorough evaluation may not be able to take place, which is why the maintenance request would be denied.

6. What is an ICAP Ineligible Forced Outage (IIFO) state?

A Generator will be placed on an ICAP Ineligible Forced outage, according to ISO Procedures if it is on a Forced Outage (U1, U2, U3, SF) for 180 days without a credible repair plan. A Generator can voluntarily reclassify itself to an IIFO after at least sixty (60) days of being on a FO. A generator that is placed in an IIFO status is can no longer provide ICAP while in the IIFO state. For units returning from an IIFO, Operating Data from the most recent like-month in which the Generator was not in an IIFO state will be utilized in the calculation of an individual unit EFORd. See section 4.4.13 of the ICAP Manual for additional information.

7. How should online testing of a unit be reported when testing is done prior to a unit being returned from PO or MO, how is the generation during testing reported?

If the unit must be on-line and in service for testing, the unit must report the testing as a Planned Derating (PD) or Maintenance Derating (D4). The derate starts when the testing begins and ends when testing is completed. The MWs generated while the unit was on-line during the testing period must be reported in the performance records for the unit.

8. Will all outside management control events get excluded from the calculation and therefore not impact a unit's EFORd? Why is there a difference in reporting each of these events in GADS data?

For the NYISO purposes of determining a unit's EFORd, Cause Code 9300 is the only cause code, from among those that are otherwise listed as "Outside Management Control,"

that will not expose the unit to EFORd degradation. 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)

9. How must resources with Energy Duration Limitation (EDL) report their GADS event and performance data?

Energy Duration limited resources are expected to submit full year-to-date GADS event and performance data for 24 hours of every day. EFORd for these resources will be calculated within a tariff specified window called the Peak Load window. This is an operationally adjusted time of demand for resources with an Energy Duration Limitation.

10. How must data be reported for events starting/ending during the Daylight-Saving transition period?

When an event starts/ends during the Daylight-Saving transition period, a manual adjustment must be made to either the event or performance data. If an event starts in the first occurrence of the EST-EDT shift or ends in the second occurrence of the EST-EDT shift, The event itself should be shifted out of the DLS shift window to avoid any submission error. For events overlapping the EDT to EST shift, the NYISO GADS software automatically accounts for the loss of an hour. (Refer to Chapter 3: Guidelines for Event/Performance Data Reporting in the GADS e-learning module for an example.)