

A faint, light-colored map of New York State is visible in the background, overlaid with a network of lines representing the power grid. The lines are thin and grey, with small colored dots (red, blue, purple) at various nodes along the network.

Fuel Assurance Initiative: Fuel and Performance Incentives *Critical Operating Day Incentives*

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Today

- ◆ **Today's meeting continues the overview of potential ICAP market changes to create additional incentives for ICAP resource performance on Critical Operating Days.**
- ◆ **We introduce an alternative to the EFORd metric: the Upper Operating Limit (UOL) metric.**
- ◆ **As indicated in the last presentation, this is a design concept that the NYISO thinks is promising and continue to be open to feedback from stakeholders on any aspect of the proposal including alternate constructs.**

Fuel Assurance

- ◆ **The NYISO does not need to make costly changes to its Market Structure for Fuel Assurance:**
 - *New York faces a different problem than ISO NE and PJM face, including different reliability needs.*
 - *The NYISO already has in place capabilities in its energy and capacity markets that are important to fuel assurance.*
 - *The NYISO also faces structural differences from PJM and ISO NE.*
- ◆ **The NYISO wants to establish incentives tailored to the NY markets that will help us maintain reliability going forward.**

Fuel Assurance Initiative

- ◆ **Multiple components:**
 - *Energy & Ancillary Service Market Changes,*
 - *Capacity Market Changes.*
- ◆ **Multi-phase with implementation over the next several years.**

Fuel Assurance Initiative: *Fuel and Performance Incentives*

Incent
Intra-day
Operational
Flexibility

Promote
Increased
Resource
Availability
and
Performance

The NYISO's Efforts

Capacity Market

- *Ways to better incent and reflect performance*
- *Possible separate Summer/Winter EFORD*

Energy Market

- *Comprehensive Shortage Pricing*
- *Comprehensive Scarcity Pricing*
- *RLS Changes*

Gas-Electric Coordination

- *EMS Visualization of Gas System*
- *Gas Operational Information Sharing*
- *Fuel Availability Self Reporting project*

Fuel Assurance

- ◆ **NYISO needs mechanisms that provide incentives for suppliers* to be available to reliably meet the real-time needs of the NYCA - especially on days when there is a high risk of a reduction in real-time resource availability due to factors including high demand and fuel supply uncertainty.**

* The intent is to have the Performance Incentive apply to ICAP suppliers. This presentation is focused on how the incentive applies to generators. Future presentations will focus on other types of capacity suppliers.

Performance Incentive

◆ Objective:

- *To provide more incentive for units scheduled in the DAM (Energy and/or reserves) or via timely SRE (or in a Forced Outage at DAM close) to be available on Critical Operating Days.*
 - Timely SREs are when the units can still reasonably purchase/schedule gas.
 - Includes units “in a Forced Outage at the time of the DAM close” because those units are not evaluated by the DAM and because this might create an incentive to declare a forced outage to avoid being subject to the Performance Incentive.
- *Do not want to discourage units from offering in real-time or day ahead.*

◆ Why a Performance Incentive?

- *Increases incentive for units the NYISO is relying on (i.e., scheduled in the DAM or via SRE) to operate on Critical Operating Days. This increases resource availability during tight operational periods.*

Performance Incentive

- ◆ Units will be included in the Performance Incentive if:
 1. *The unit is an ICAP Supplier, and*
 2. *The unit is DAM scheduled for Energy or Reserves, or the unit has been timely SREd (prior to noon on the day prior to the operating day), or the unit is in a Forced Outage at the time of the DAM close, and*
 3. *A Critical Operating Day has been noticed prior to noon on the day prior to the operating day.*

How it works

- ◆ **On Critical Operating Days compare the unit's availability to a baseline.**
 - *If the unit, using this metric, under-performs relative to the baseline, the unit gets a charge,*
 - *If the unit, using this metric, over-performs relative to the baseline, it is eligible to receive a payment,*
 - *If the unit, using this metric, neither over- or under-performs, the unit does not get a charge or a payment.*

How it works

- ◆ The revenue collected from charges to under-performers will fund the payments to over-performers.
- ◆ If insufficient revenue to pay the over-performers is collected from under-performers, the collected revenue is distributed *pro rata* (using a MW basis) to over-performers.
- ◆ A “stop loss” provision prevents all the monthly capacity revenue from being at risk unless there are 5 or more Critical Operating Days in a Month.
- ◆ The charges and payments will be assessed on a monthly basis.
- ◆ If more is collected in charges in a month than is paid out, the excess will be included with the next month’s charges to fund payments to units over- performing.
- ◆ There will be no additional *direct* charges to loads from this Performance Incentive. But we do expect there to be behavioral changes as units weigh the impact of possible charges and payments, and therefore there are likely to be some costs to loads.

Performance Metrics: EFORd

◆ EFORd Metric

- *This metric was introduced and reviewed at the October 27 and December 18 ICAP WG meetings.*
- *Baseline: AEFORd*
- *The Performance Incentive for a unit is calculated using the same rules as the Baseline EFORd* but only on the days where the unit is subject to the Performance Incentive.*
 - *Over-performance offsets under-performance.*
- *The net performance determines if it receives a charge (net under-performance) or a payment (net over-performance)*
- *The Zonal UCAP Price is used to calculate the performance incentive.*

***More than one unit at the same PTID can continue to be aggregated for purposes of GADS/EFORd and for the performance incentive.**

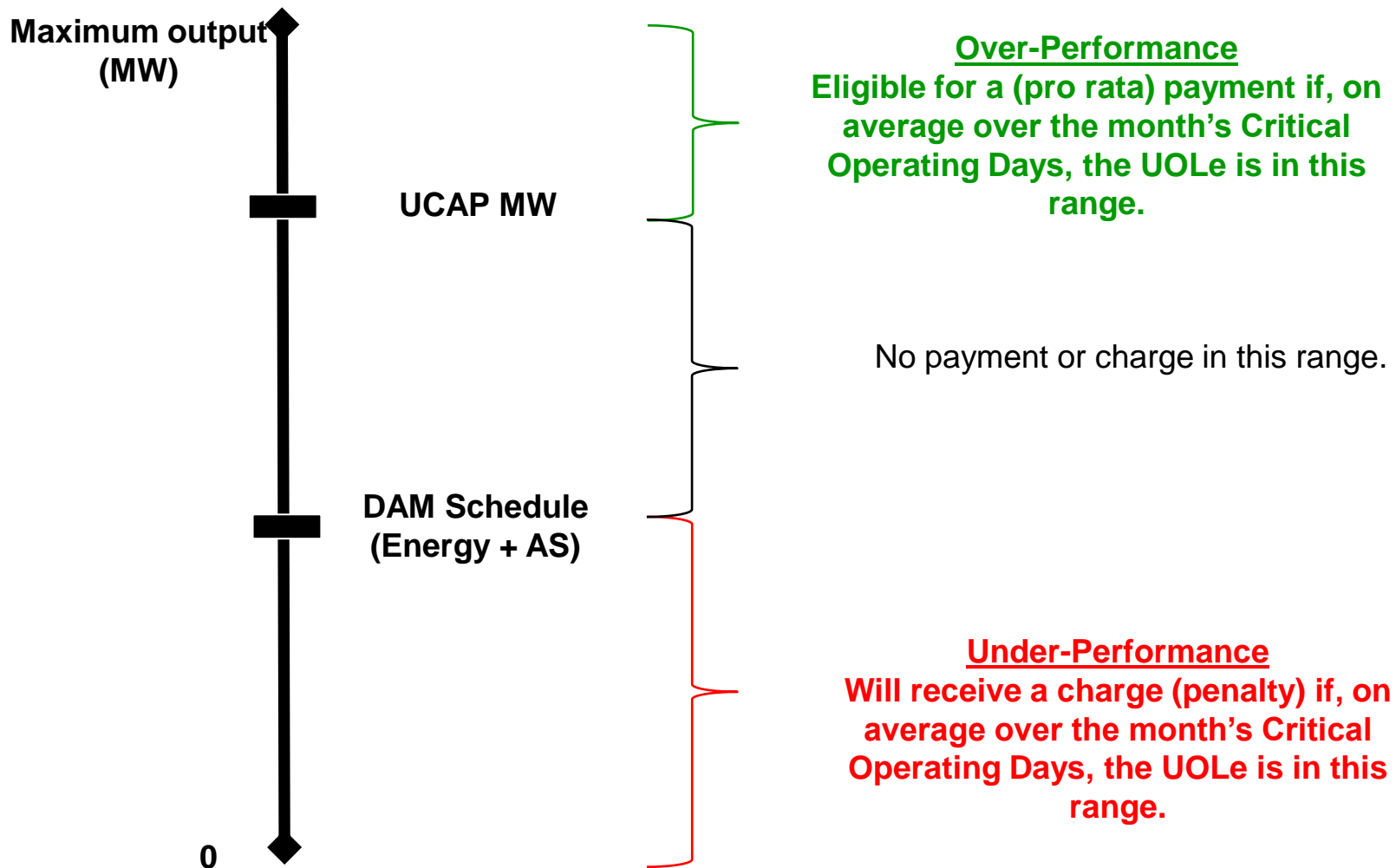
Performance Metrics: UOL (NEW)

◆ Upper Operating Limit (UOL) Metric

- *Baseline: for under-performance: DAM Schedule (Energy and Ancillary Services); for over-performance: UCAP MW*
- *The Performance Incentive is calculated by looking at the Real Time Emergency Upper Operating Limit (UOLe) relative to the DAM schedule and UCAP MW over the critical operating days in the month**
 - **Over-performance offsets under-performance**
- *The net performance determines if they receive a charge (net under-performance) or a payment (net over-performance)*
- *The Zonal UCAP Price is used to calculate the performance incentive.*

*The time weighted/integrated UOLe will be compared to the time weighted/integrated DAM schedule over all the eligible Critical Operating Days.

Dispatchable Generator Example



Differences and Similarities

◆ EFORd Metric

- *Based on outages and startup attempts*
- *Not intuitive or easy to calculate: EFORd calculation rules are fairly non-linear/have break points*
- *Does not differentiate between outages that impact the unit in a particular range and those that don't (only the impact of the outage on the EFORd calculation matters)*
- *Likely to be costly during tight gas days since generators have to manage possibility of being dispatched above their DAM schedule*

◆ UOL Metric

- *Only based on outages and the impact of the startup failures on UOL*
- *More intuitive and easier to calculate*
- *Differentiates between outages that impact the unit below a specific MW level (ex. DAM schedule or UCAP MW) and outages that don't have the UOL fall below a threshold.*
- *Targets DAM scheduled MW but does not over encourage over-procurement of Gas ("not like New England") (less cost to consumers than EFORd metric)*

Issues to be considered

- ◆ **Should units that have not sold ICAP but are DAM scheduled be included in the performance incentive?**
 - *If so, what is their over-performance baseline?*
- ◆ **Under the UOL metric, does the Critical Operating Day have to be noticed prior to noon on the day prior to the operating day for that day to be a Performance Incentive day?**
 - *Is there additional risk for DAM scheduled units if the Critical Operating day is noticed after noon on the day prior to the operating day?*
 - *SREd units would be noticed as soon as practicable. A stakeholder requested we consider moving the bright line cut off earlier to provide more time for gas units to secure fuel. The NYISO believes that noon balances the SREd unit's need for time to secure gas with Operations need to evaluate if SREs are needed subsequent to the Day Ahead Market run.*

Additional details

- ◆ The Performance Incentive is assessed on a monthly basis and is scaled so that a single Critical Operating Day of forced outage does not account for more than 20% of monthly ICAP revenue. If there are 5 or more Critical Operating Days the maximum charge is the monthly ICAP revenue.
 - *This is done using a Stop Loss Factor (renamed from “Scaling Factor” at stakeholder request) where for one monthly Critical Operating Day $SLF=1/5$, two $SLF=2/5$, ..., 5 or more $SLF=1$.*

Example 1- Under-performing

- ◆ The ICAP Market Clearing Price for the area that includes the unit “Blue Generator” (i.e., the Locality or NYCA clearing price) is \$6/kW-Month (i.e., \$6000/MW-Month).
 - *Unit A received a monthly ICAP market payment of $100 * (1-0.1) * 6000 = \$540,000$ and their UCAP is $100 * (1-0.1) = 90\text{MW}$*
- ◆ In the month of July, there were 6 “two day ahead” called Critical Operating Days. (i.e., Stop Loss Factor SLF=1)
- ◆ Unit “Blue Generator” had a DAM schedule on all 6 Critical Operating Days at 60MW.
- ◆ Unit “Blue Generator” has an average UOLe of 50MW for those 6 Critical Operating Days.
- ◆ Unit “Blue Generator” receives a charge of:
 - *If Average UOLe is less than the average DAM schedule (for under-performance): $[Average\ UOLe - DAM\ Schedule] * Zonal\ UCAP\ Price * Stop\ Loss\ Factor = charge\ (if\ negative)$*
 - *If Average UOLe is greater than the UCAP MW (for over-performance): $[Average\ UOLe - UCAP\ MW] * Zonal\ UCAP\ Price * Stop\ Loss\ Factor = payment\ (if\ positive)$*
 - *$[50-60] * 6000 * 1 = -60,000 \rightarrow A\ \$60,000\ charge.$*
 - *This means that their total Capacity payments are: $[Auction\ Revenue] - [Charge] = \$540,000 - \$60,000 = \$480,000$*

Example 2- Over-performing

- ◆ The ICAP Market Clearing Price for the area that includes the unit “Red Generator” (i.e., the Locality or NYCA clearing price) is \$6/kW-Month (i.e., \$6000/MW-Month).
 - *Unit A received a monthly ICAP market payment of $100 * (1-0.1) * 6000 = \$540,000$ and their UCAP is $100 * (1-0.1) = 90\text{MW}$*
- ◆ In the month of July, there were 6 “two day ahead” called Critical Operating Days. (i.e., Stop Loss Factor SLF=1)
- ◆ Unit “Red Generator” had a DAM schedule on all 6 Critical Operating Days at 60MW.
- ◆ Unit “Red Generator” has an average UOLe of 95MW for those 6 Critical Operating Days.
- ◆ Unit “Red Generator” receives a payment of:
 - *If Average UOLe is less than the average DAM schedule (for under-performance): [Average UOLe- DAM Schedule]* Zonal UCAP Price*Stop Loss Factor= charge (if negative)*
 - *If Average UOLe is greater than the UCAP MW (for over-performance): [Average UOLe – UCAP MW]* Zonal UCAP Price* Stop Loss Factor = payment (if positive)*
 - *[95-90]* 6000*1= 30,000 → They are eligible for up to a \$30,000 credit.*
 - *This means that their total Capacity payments are (assuming no pro rata allocation):*
 $[Auction Revenue] + [Credit] = \$540,000 + \$30,000 = \$570,000$

Next Steps

- ◆ The next meetings will include additional discussion on the proposed changes as well as specifics on the treatment of other types of resources (Demand Response, Intermittent Resources, UDRs, etc.).
- ◆ The next meeting is anticipated to be in March.
- ◆ The NYISO welcomes all comments.
 - *Written comments can be sent to Debbie Eckels deckels@nyiso.com*

APPENDICES

APPENDIX A: WHY THE NYISO DOES NOT NEED TO MAKE COSTLY CHANGES TO ITS MARKET STRUCTURE FOR FUEL ASSURANCE

Fuel Assurance

- ◆ **The NYISO does not need to make costly changes to its Market Structure for Fuel Assurance:**
 - *New York faces a different problem than ISO NE and PJM face, including different reliability needs.*
 - *The NYISO already has in place capabilities in its energy and capacity markets that are important to fuel assurance.*
 - *The NYISO also faces structural differences from PJM and ISO NE.*
- ◆ **The NYISO wants to establish incentives tailored to the NY markets that will help us maintain reliability going forward.**

Reasons why the NYISO does not need to make costly changes to its Market Structure for Fuel Assurance: Market Features

- *Ability for a supplier to offer unique hourly bids (DAM and RT) so units can reflect changing costs.*
- *Integration of DARU and Reliability Units in the Day Ahead Market, so these units receive day-ahead market schedules in time to buy and schedule gas.*
- *Ability to increase hourly bids in real-time to reflect the supplier's expectation of fuel costs and manage the consumption of gas over the day.*
- *Earliest Day-Ahead Market posting time: 930AM – two and half hours before the next day gas nomination period ends and a reliability commitment that is completed at the same time, allowing resources committed in the forecast load pass to buy and schedule gas.*

Reasons why the NYISO does not need to make costly changes to its Market Structure for Fuel Assurance: Market Features

- *Hybrid, offline GT and Shortage pricing: signals when short of reserve, regulation, or transmission to incentivize resources to procure fuel necessary to meet their schedule obligations and reflect critical operating conditions.*
- *Monthly capacity market spot auctions, rather than an annual procurement period, allows a resource to offer supply in the winter and summer months based on the resource's actual availability during that time of year.*

Reasons why the NYISO does not need to make costly changes to its Market Structure for Fuel Assurance: Structural Differences

- **NY has different reliability needs which have led to NYC and LI dual fuel requirements.**
- **ISO NE has inadequate natural gas pipelines- located at the end of the pipelines, they have less access to natural gas.**
- **PJM and ISO NE have fewer dual fuel units – A substantial proportion of NY’s gas fired resources have access to an alternate fuel.**
- **Not all PJM or New England states have competitive gas markets. In some states, gas is allocated by the LDC based on curtailment rules, rather than willingness to pay, reducing the gas supply available to gas fired generation on gas LDC systems.**
- **PJM is looking at significant coal retirements based in part on the Mercury and Air Toxics Standards (MATS) and Regional Haze programs.**

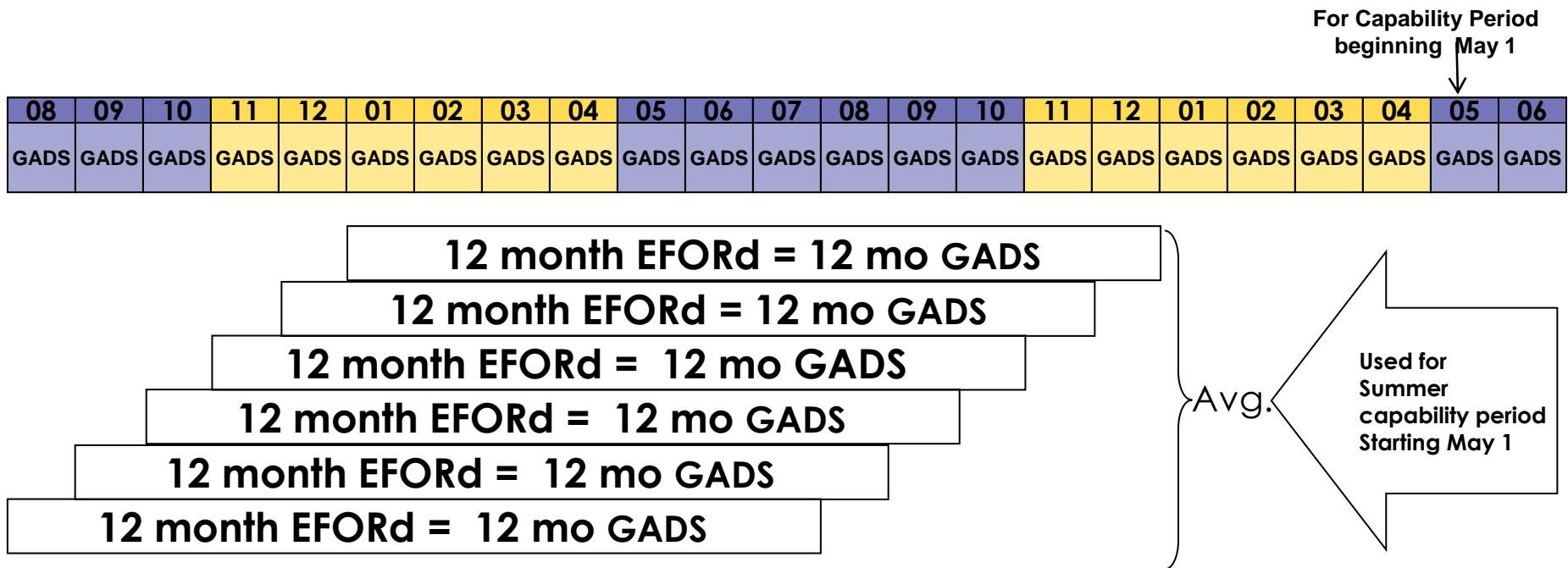
APPENDIX B: EFORD BASELINE AND CURRENT AEFORD METHOD

What's the baseline?

- ◆ For generators, the NYISO uses an average of six 12-month EFORd calculations to establish a Summer and Winter ICAP to UCAP derating factor (the AEFORd).
 - *This means that the derating factors for Summer and Winter blend both Summer and Winter GADS Data and effectively weights some of the months more heavily than others.*
- ◆ Since some units are likely to have different performance characteristics in the Summer and Winter, the NYISO is considering a “like season EFORd” baseline for the performance incentive (“Baseline EFORd”).

EFORd Example:

NYISO uses an average of six 12-month EFORd calculations to establish a Summer ICAP to UCAP derating factor ($AEFORd_{summer}$)



If month m is in the Summer Capability Period, its $AEFORd$ = average of the GADs outage values for the 12 month periods ending in July, Aug, Sept, Oct, Nov, Dec that precede month m .

If month m is in the Winter Capability Period, its $AEFORd$ = average of the GADs outage values for the 12 months periods ending in Jan, Feb, Mar, Apr, May, June.

“Like Season” Baseline EFORd

- ◆ The objective is to have a baseline from which to measure ICAP unit performance on Critical Operating Days.
- ◆ The “like season” baseline EFORd would use the data from the past 3 “like” capability seasons to calculate the EFORd.
 - *For example, the most recent 18 months of summer data would be used to calculate the baseline for summer capability periods.*
 - *There would be no weighting of the months – each month would be considered on the same basis.*
 - *The same rules would be used as are currently used in the EFORd currently.*
 - No additional data submittals would be required.

“Like Season” Baseline EFORd Example:

Uses the data from the past 3 “like” capability seasons with no weighting.

Summer 2014												2015								
11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	
GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS

For Capability Period beginning May 1, 2015
↓

6 mo GADS

Summer 2012						Summer 2013											
05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10
GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS	GADS

+6 mo GADS

+6 mo GADS

If month *m* is in the Summer Capability Period, its “Baseline EFORd” = average of the GADs outage values for the 18 summer months that precede the summer capability period.
 If month *m* is in the Winter Capability Period, its “Baseline EFORd” = average of the GADs outage values for the 18 months that precede the winter capability period

Baseline EFORd

- ◆ The NYISO calculated what the Baseline EFORd would have been for Summer 2014 and Winter 2014-15 versus the existing EFORd:

Generation Type*	Average SUMMER 2014 EFORd	Average of SUMMER 2014 Baseline EFORd	Average of WINTER 2014-15 EFORd	Average of WINTER 2014-15 Baseline EFORd
COMBINED CYCLE	6.4%	5.2%	5.0%	4.1%
COMBUSTION	12.0%	10.4%	13.4%	14.7%
FOSSIL FUEL	6.9%	6.9%	5.7%	6.9%
NUCLEAR STEAM	3.0%	2.3%	2.0%	3.7%
Average (all Types*)	10.0%	8.7%	10.4%	11.3%

- ◆ The NYISO is considering if the EFORd used in the auction should also be changed to the “like season” baseline EFORd.

* Some generation types have been omitted to preserve confidentiality however all units are included in the Average

APPENDIX C: CRITICAL OPERATING DAYS

Critical Operating Days

- ◆ The NYISO will be instituting Critical Operating Day notices:
 - *Can be called with two days notice, one day notice or in real-time.*
- ◆ The criteria have been updated
 - *Removed the use of the external area forecast*
 - *Combined two other criteria*
- ◆ Two day notice: On a best efforts basis, the NYISO will declare a Critical Operating Day by 17:00 two days prior to the operating day based on forecasted conditions.
 - *Conditions to declare a Critical Operating Day include:*
 - Load forecasts of greater than 30,000MW (without losses) for any hour of the day in the Summer Capability Period (May 1-October 31). The source of the load forecast used will be the posted load forecast on NYISO.com.
 - Load forecasts of greater than 23,000MW (without losses) for any hour of the day in the Winter Capability Period (November 1-April 30). The source of the load forecast used will be the posted load forecast on NYISO.com.
 - NYISO forecasting the inability to meet load or reserve requirements on a system wide or locational basis
 - Forecast of insufficient generation availability to meet transmission security (SENY N-1-1 as an example).

Critical Operating Days

- ◆ **One day notice, DAM post to real-time: On a best efforts basis, the NYISO will declare a Critical Operating Day by noon on the day prior to the operating day, based on forecasted conditions.**
 - ***Conditions to declare a Critical Operating Day, if not already called on a two day ahead basis, include:***
 - **Load forecasts of greater than 31,200MW (including losses) for any hour of the day in the Summer Capability Period (May 1-October 31). The source of the load forecast will be the best available load forecast for the next operating day.**
 - **Load forecasts of greater than 24,200MWs (including losses) for any hour of the day in the Winter Capability Period (November 1-April 30). The source of the load forecast will be the best available load forecast for the next operating day.**
 - **NYISO forecasting the inability to meet load or reserve requirements on a system wide or locational basis.**
 - **Insufficient generation availability to meet transmission security (SENY N-1-1 as an example).**
 - **Issuing a Day Ahead Advisory for SCR/EDRP.**

Critical Operating Day Data

- ◆ At stakeholder request, the following provides information on what days would have been declared Critical Operating Days had the criteria existed in 2012-2014.
- ◆ Day Ahead and 2 Day Ahead forecasts from January 3, 2012 through October 28, 2014:
 - *In the Winter Capability period the two day Day Ahead forecast thresholds would have been met 9 times in 2014 (January 3, 7, 8, 22, 23, 24, 27, 28, 29), 8 times in 2013 (January 23, 24, 25 and December 12, 13, 16, 17, 18) and not at all in 2012. The Day Ahead criteria or any other would not have caused any additional days to be declared Critical Operating Days.*
 - *In the Summer Capability period the two day Day Ahead forecasts thresholds would have been met 4 times in 2012 (June 21, July 16, 17, 18), 5 times in 2013 (July 10, 15, 16, 17, 18) and 0 times in 2014. The Day Ahead criteria would have triggered the notice on June 20th 2012. The SCR Criteria would have also indicated June 22nd was a Critical Operating Day.*

APPENDIX D: EFORD METRIC EXAMPLES

Example 1- EFORd Base under-performing example

- ◆ Unit A 100MW unit has an AEFORd=0.1 and a summer baseline EFORd=0.1
- ◆ The ICAP Market Clearing Price for the area that includes the unit (i.e., the Locality or NYCA clearing price) is \$6/kW-Month (i.e., \$6000/MW-Month).
 - *Unit A received a monthly ICAP market payment of $100 * (1-0.1) * 6000 = \$540,000$ and their UCAP is $100 * (1-0.1) = 90\text{MW}$*
- ◆ In the month of July, there were 6 “two day ahead” called Critical Operating Days. (i.e., stop loss factor SLF=1)
- ◆ Unit A had a DAM schedule on all 6 Critical Operating Days
- ◆ Unit A has a PI EFORd=0.2 for those 6 Critical Operating Days.
- ◆ Unit A receives a charge of:
 - *[Baseline EFORd- PI EFORd]* MW ICAP* Zonal UCAP Price* SLF = charge (if negative, and credit if positive)*
 - *[0.1-0.2]* 100*6000*1= -60,000 → A \$60,000 charge.*
 - *This means that their total Capacity payments are: [Auction Revenue]-[Charge]=\$540,000-\$60,000=\$480,000*

Example 2- EFORd Base over-performing example

- ◆ Unit B 100MW unit has an AEFORd=0.1 and a summer baseline EFORd=0.1
- ◆ The ICAP Market Clearing Price for the area that includes the unit (i.e., the Locality or NYCA clearing price) is \$6/kW-Month (i.e., \$6000/MW-Month).
 - *Unit B received a monthly ICAP market payment of $100 * (1-0.1) * 6000 = \$540,000$ and their UCAP is $100 * (1-0.1) = 90\text{MW}$*
- ◆ In the month of July, there were 6 “two day ahead” called Critical Operating Days. (i.e., stop loss factor SLF=1)
- ◆ Unit B had a DAM schedule on all 6 Critical Operating Days
- ◆ Unit B has a PI EFORd=0 for those 6 Critical Operating Days.
- ◆ Unit B receives a credit** of:
 - *[Baseline EFORd- PI EFORd]* MW ICAP * Zonal UCAP Price* SLF= charge (if negative, and credit if positive)*
 - *[0.1-0]* 100*6000*1= 60,000 → A \$60,000 credit.*
 - *This means that their total Capacity payments are: [Auction Revenue]-[Charge]= $\$540,000 + \$60,000 = \$600,000$*

** Assumes that sufficient revenue has been collected from under-performers

Example 3- EFORd Scaling example

- ◆ Unit B 100MW unit has an AEFORd=0.1 and a summer baseline EFORd=0.1
- ◆ The ICAP Market Clearing Price for the area that includes the unit (i.e., the Locality or NYCA clearing price) is \$6/kW-Month (i.e., \$6000/MW-Month).
 - *Unit B received a monthly ICAP market payment of $100 * (1-0.1) * 6000 = \$540,000$ and their UCAP is $100 * (1-0.1) = 90\text{MW}$*
- ◆ In the month of July, there was one “two day ahead” called Critical Operating Days (stop loss factor SLF=0.2).
- ◆ Unit B had a DAM schedule on the single Critical Operating Day.
- ◆ Unit B has a PI EFORd=0 for that one Critical Operating Days.
- ◆ Unit B receives a credit** of:
 - *[Baseline EFORd- PI EFORd]* MW ICAP * Zonal UCAP Price* SLF= charge (if negative, and credit if positive)*
 - *[0.1-0]* 100*6000*0.2= 12,000 → A \$12,000 credit.*
 - *This means that their total Capacity payments are: [Auction Revenue]-[Charge]= $\$540,000 + \$12,000 = \$552,000$*

** Assumes that sufficient revenue has been collected from under-performers

Example 4 – EFORd comparing a “good performer” and a “bad performer”

- ♦ **Unit X** 100MW unit has an AEFORd=0.1 and a summer baseline EFORd=0.1.
- ♦ **Unit Z** 100 MW unit has an AEFORd=0.5 and a summer baseline EFORd=0.5.
- ♦ The ICAP Market Clearing Price for the area that includes the units (i.e., the Locality or NYCA clearing price) is \$6/kW-Month (i.e., \$6000/MW-Month).
 - *Unit X received a monthly ICAP market payment of $100 * (1-0.1) * 6000 = \$540,000$ and their UCAP is $100 * (1-0.1) = 90\text{MW}$*
 - *Unit Z received a monthly ICAP market payment of $100 * (1-0.5) * 6000 = \$300,000$ and their UCAP is $100 * (1-0.5) = 50\text{MW}$*

Example 4 (cont.)

- ◆ In the month of July, there were 6 “two day ahead” called Critical Operating Days (the stop loss factor SLF=1).
- ◆ Both units had a DAM schedule on all six Critical Operating Days.
- ◆ Both units had complete forced outages on two of the days and operated without a problem on the other three Critical Operating Days.
 - *Unit X PI EFORd* = $2/6 = 0.333$
 - *Unit Z PI EFORd* = $2/6 = 0.333$
- ◆ **Unit X** receives a charge of:
 - *[Baseline EFORd- PI EFORd]* MW ICAP* Zonal UCAP Price* SLF = charge (if negative, and credit if positive)*
 - $[0.1-0.333]* 100*6,000*1 = -139,800 \rightarrow$ A \$ 139,800 charge.
- ◆ This means that their total Capacity payments are:
 - $[Auction Revenue]-[Charge]=\$540,000 - \$ 139,800 =\$400,200$

Example 4 (cont.)

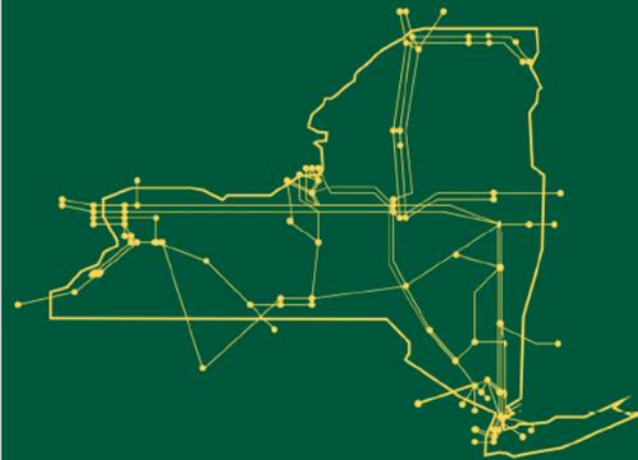
- ◆ **Unit Z** receives a credit** of:
 - $[Baseline\ EFORd - PI\ EFORd] * MW\ ICAP * Zonal\ UCAP\ Price * SLF =$
charge (if negative, and credit if positive)
 - $[0.5 - 0.333] * 100 * 6,000 * 1 = 100,200 \rightarrow$ A \$ 100,200 credit.

- ◆ This means that their total Capacity payments are:
 - $[Auction\ Revenue] + [Credit] = \$300,000 + \$100,200 = \$400,200$

- ◆ Because both units performed the same in July on the six Critical Operating Days, *both units had the same ICAP Auction revenue net of the Performance Incentive payments.*
 - **Unit X** $[Auction\ Revenue] - [Charge] = \$540,000 - \$139,800 = \$400,200$
 - **Unit Z** $[Auction\ Revenue] + [Credit] = \$300,000 + \$100,200 = \$400,200$

** Assumes that sufficient revenue has been collected from under-performers

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



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