

External SRE Penalty Proposal

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Agenda

- Project background, objectives, & challenges
- Example capacity call
- Review of proposed external resource SRE requirements
- Review of external resource SRE penalty proposal
- SRE communication
- Next Steps
- Appendix Contents:
 - Stakeholder feedback summary, make-whole payment examples, additional background, example penalty calculation

Background



Previous Discussions

Date	Working Group	Discussion points
04-24-18	ICAPWG	Discussed proposal with stakeholders and took feedback
05-31-18	ICAPWG	Discussed proposal with stakeholders and took feedback
07-31-18	ICAPWG	Market Design Concept Proposal for External Supplier Obligations
10-18-18	ICAPWG	Discussed External SRE Penalty Proposal and took feedback
11-30-18	ICAPWG	Discussed External SRE Penalty Proposal, internal and external capacity supplier comparability, and make-whole payment examples, and took feedback

Project Background

- **The External Resource Performance & Eligibility project originates from recommendations in October 2017 Analysis Group report for improving external resource performance, particularly during critical operating conditions**
- **Considerations that are driving this effort:**
 - External capacity resources are expected to deliver energy and provide value to Grid Operations at a level that is comparable with internal resources
 - The authority for the NYISO to call on external resources that have sold into the NYISO markets exists today; however, improvements are needed to better manage this process
 - External capacity suppliers are currently able to receive capacity payments without providing energy, even when called upon by NYISO Operations during critical system conditions

Objectives

- Improve requirements for external capacity sellers to ensure these resources are providing comparable reliability value to that which is expected of internal resources
- Enhance delivery of the energy, when we call upon that energy for reliability, corresponding to the capacity that external capacity suppliers sold into the NYISO markets
- We also aim to minimize impacts to current software systems, operational processes, and market rules, in order to allow for faster implementation

Challenge

- **Given the current market design, depending on the economics of its SRE bid, an external capacity resource may not be scheduled by the NYISO software to provide energy when it is needed for reliability**
 - Thus, the NYISO cannot rely on external capacity to the same degree that it can rely on internal capacity
- **External transactions that are not backed by an operating resource that has sold capacity to NY may be curtailed because the resources supporting them are not currently required to be online**

Internal and External Supplier Comparability

- **Resources electrically located in the NYCA can be SRE'd based on cost and MW quantity to satisfy a reliability need**
 - External capacity suppliers cannot be evaluated by the NYISO SRE software based on cost to supply Energy or the MW that will be supplied in response to the SRE call
- **The NYISO calls entire interfaces when calling external capacity**
 - In that manner, individual external resources are SRE'd
 - NY accommodates all MW that get scheduled over whichever interface(s) the NYISO selects to meet the reliability need

The SRE Process

- **Normal operating process:**
 1. NYISO identifies a reliability need following the day-ahead market run
 2. NYISO SRE's available internal resources that cost less than SCRs
 3. If internal resources are insufficient, then the NYISO SREs external capacity
 4. If the need is still not met, the NYISO then calls demand response
 5. Finally, for any remaining need, the NYISO SRE's available generation in NY that costs more than SCRs
- **The following slides contain examples of how NYISO Operations might select resources for an SRE to satisfy a reliability need**

Example Capacity Call

Example Critical Operating Day: Current Rules

Time	NYISO Action	Required External Capacity Supplier Action
Monday @ 11:00	The NYISO Day-Ahead Market posts with adequate resources procured for the forecasted load.	-
Monday @ 13:00	A large generator trips following the Day-Ahead post that will be unable to return for tomorrow, so NYISO determines that insufficient resources are available to meet the forecasted load, and begins issuing SREs for internal NY resources (that cost less than SCRs) to begin responding at 10:00 on Tuesday.	-
Monday @ 14:00	NYISO determines that insufficient internal resources will be available to meet tomorrow's need and posts a website notice to call upon an external interface. An email is also provided to the listed MIS contact.	-
Monday @ 14:05	Tomorrow's need is still not anticipated to be fully met, so the NYISO issues an SCR notice.	-
Tuesday @ 10:00	NYISO confirms that SCRs will be needed at 14:00.	-
Tuesday @ 14:00	-	External capacity suppliers that are required to offer energy at the selected interface submit import bids for the ICAP equivalent of UCAP sold at any price (up to \$2000).

Example Critical Operating Day: Proposed Rules

Time	NYISO Action	Required External Capacity Supplier Action
Monday @ 11:00	The NYISO Day-Ahead Market posts with adequate resources procured for the forecasted load.	-
Monday @ 13:00	A large generator trips following the Day-Ahead post that will be unable to return for tomorrow, so NYISO determines that insufficient resources are available to meet the forecasted load, and begins issuing SREs for internal NY resources (that cost less than SCRs) to begin responding at 10:00 on Tuesday.	-
Monday @ 14:00	NYISO determines that insufficient internal resources will be available to meet tomorrow's need and posts a website notice to call upon an external interface. An email is also provided to the listed MIS contact.	-
Monday @ 14:05	Tomorrow's need is still not anticipated to be fully met, so NYISO issues an SCR notice.	External capacity suppliers that are required to offer energy at the selected interface begin to start up, if offline but able to be online for the call, with the aim of being able to provide as much of their ICE as possible by 14:00 on Tuesday.
Tuesday @ 10:00	NYISO confirms that SCRs will be needed at 14:00.	-
Tuesday @ 14:00	-	External capacity suppliers that are required to offer energy at the selected interface are online (if start-up permits), bid their ICE at the offer floor (if physically capable to be online), and flow their transaction if scheduled by the NYISO software.

The External SRE Selection Process



External SRE Selection Process

- The NYISO considers a variety of situational factors when determining what resources/interfaces to SRE, including the following:
 - System changes since the day-ahead run
 - Changes in generation capability
 - Changes in load forecast
 - Transmission outages
 - Transmission constraints
 - Thermal overloads, potential voltage issues
 - Regional coordination
 - External areas forecasting deliverability issues
 - Ability to solve system needs at the local level
 - Work with Transmission Owners to determine if a statewide need could be solved by addressing a more localized issue

Proposed External SRE Requirements

Strategy to Enhance Response of External Capacity Suppliers

- Further incentivize external capacity resource performance during periods of critical system conditions
 - To accomplish this goal, we propose to update the obligations of external capacity suppliers as well as establish new consequences for external resources' non-compliance
 - The NYISO proposes that failure to meet the existing and new obligations will result in a new penalty, as discussed in later slides

Proposed External Capacity Call Requirements

- If the NYISO issues a notice on its website requesting capacity from an external Control Area, then all external capacity suppliers that are required to offer their energy at the external proxy(s) identified in the NYISO's posted notice shall take all of the actions specified below to ensure delivery of energy from their designated capacity resources, to either the Locality or to the NYCA, as applicable to the call:
 - 1) for the hours that the resource can be online, fulfill the SRE bid request for the ICAP equivalent of the UCAP sold, *i.e.*, bid at the offer floor; and
 - 2) a. the resource must be operating for the entire duration of the call, if physically capable of doing so, otherwise bid to operate for as much of the call as its operational characteristics allow; and
b. the resource must be available up to the ICAP equivalent of the UCAP sold for the entire duration of the call if physically capable of doing so; and
 - 3) if the transaction(s) is/are scheduled in the energy market, flow the capacity-backed transaction(s) to the appropriate Proxy Generator Bus at the NYCA border

External Capacity Supplier Bidding Requirements

NYISO Operations Action	Current Bidding Requirement	Proposed Bidding Requirement
Operations issues an SRE notice for an external interface	Each capacity resource behind the selected interface must place an import bid for its ICE into the real-time market during the hours of the SRE call (up to \$2000)	Each capacity resource behind the selected interface must place an import bid at the bid floor for its ICE into the real-time market for the hours of the SRE call

Requirement 1: Why does the supplier need to bid at the offer floor?

- Since the NYISO software does not have the ability to make import transactions “must run,” bidding at the offer floor ensures that the transaction will receive a schedule
- Bidding at the bid floor maximizes the likelihood that an external capacity transaction will be scheduled by the RTC economic evaluation during a critical event
 - This approach allows for more efficient scheduling of other resources

Requirement 2a: Why does the resource need to be online?

- It is important that an external capacity resource be online in response to an SRE call because if the resource is not online, the external Control Area could cut the associated transaction for a capacity deficiency in the external region

Requirement 2b: Why does the resource need to be available up to the ICAP equivalent of UCAP sold?

- **This requirement ensures that NYISO Operations can count on the entire MW amount that was sold in the NYISO capacity auctions for that month**

Requirement 3: Why does the transaction need to flow to the NY border?

- **This step proves that the external resource was indeed able to deliver the energy for which it received a schedule across the necessary external transmission in order to supply NY's need**

Requirements: Additional Details

- **If an external capacity supplier does not demonstrate satisfaction of all requirements on the previous slide, then the supplier will be assessed a penalty**
 - Note: Consistent with current rules, an external capacity supplier that is in a forced outage during a capacity call will have its future availability affected by an EFORD impact
 - It will not be subject to the proposed penalty associated with a failure to respond to a capacity call
 - It may be subject to an after-the-fact review to verify its outage status
- **If, due to the timing of the SRE notice and unit operational characteristics, an external capacity supplier cannot physically be online in time to respond to the capacity call, it will not be subject to the penalty for the hours it could not be online**
 - The resource will be subject to an after-the-fact review to verify its operating limitations
 - If the resource was denied a start by the external Control Area, it would be subject to the penalty
 - This is a risk the NYISO views to appropriately lie with the external supplier as opposed to the NY consumer
- **An external capacity supplier is not prohibited from placing bids into NYISO and other RTO markets during the SRE call hours**

External Resource SRE Penalty Proposal

Rationale for Penalty Proposal

- **Unlike external resources, internal resources selected for an SRE will be marked by NYISO Operations as “Must Run”**
 - This status ensures that a unit will receive an energy schedule without needing to be economically scheduled by the NYISO software
 - It will be scheduled on at minimum generation and available for further dispatch
 - It is not possible within the current NYISO software to assign this status to an external transaction
- **The NYISO does not have full visibility of external resources or full visibility or control over external transmission**
 - NYISO Operations has the ability to manage internal transmission outages in order to make internal capacity available

Rationale Continued

- **Internal resources are subject to energy market mitigation rules, while external resources are not**
 - The NYISO's mitigation measures incentivize internal resources to bid accurately with respect to their costs
 - If an internal capacity supplier failed to be available and operating up to the ICAP equivalent of UCAP sold for the entire duration of an SRE call (for a reason other than an outage), the NYISO would look to energy market mitigation consequences

External Resource SRE Penalty Proposal

- If an external resource fails to meet any or all criteria described on slide 9, it shall be subject to the penalty consistent with the formula below

$$\text{Deficiency charge} = 1.5 * \text{PRICE} * \left(\frac{1000kW}{1MW} \right) * \left(\frac{\sum_{n=1}^N (\max(ICAP_n^{MWh} - SRE_n^{MWh}, 0))}{N} \right)$$

- This equation multiplies 1.5 by the applicable ICAP Spot Market clearing price, which is then multiplied by the number of MWh of shortfall and divided by the total number of SRE call hours that the resource could be online for
- Deficiencies will be calculated on a monthly basis, using the total number of SRE call hours in a given month that the resource could be online for, and the total number of MW of shortfall in that month
- See example in appendix

External Transmission Limitations as a Barrier to Delivery

- The NYISO has evaluated stakeholder feedback on the topic of external transmission limitations that might prevent an external capacity supplier from delivering energy
 - The NYISO views this risk to appropriately lie with external capacity suppliers
 - External capacity suppliers can appropriately bid the risk of incurring the new SRE penalty into their capacity offer costs, just as other risks may be incorporated into bids
 - The NYISO has authority to approve/reschedule internal outages and generally has the authority to order that internal transmission be returned to service, but it can only request that transmission be returned externally

SRE Communication



SRE Communication

- External capacity sellers are officially notified of SRE capacity calls through a posting to the NYISO website, located at:

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

- The NYISO will also endeavor to send an email to the ICAP resource's designated contact
 - An email is expected to be sent, but the NYISO would like to avoid making the penalty contingent upon the receipt of an email, as the email is less verifiable than the website posting

Questions?

Email deckels@nyiso.com and
acarney@nyiso.com

Next Steps

- Return to working group to discuss Tariff
- Target Tariff vote in Q1 2019

The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system



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Appendix

Stakeholder Feedback Summary

- **Contention that start-up times should be considered when determining if an external supplier is eligible for the penalty (see slides 17 and 23)**
- **Request for description of make-whole payments (see slides 36-40)**
- **Request for communication process changes (see slide 30)**
- **Contention that external suppliers should not be subject to the new penalty if external transmission is the reason that they cannot deliver to NY (see slide 28)**
- **Request for more detail on the SRE selection process (see slides 9-14)**

SRE Make-Whole Payments

- **Costs incurred by a resource in responding to an SRE, such as start-up, minimum generation, and incremental costs are made whole by the NYISO**
 - Opportunity costs could possibly be included as well
 - Eligibility for make-whole payments will be evaluated by the NYISO Market Mitigation team on a case-by-case basis
 - Resources that have been SRE'd by the NYISO may lower but cannot raise accepted bid costs for the duration of the time that the resource is committed as an SRE

Make-Whole Payment Examples

- **The NYISO recognizes that Market Participants may incur costs in responding to a NYISO SRE, which may not be offset by energy market revenues**
 - The following three slides describe circumstances under which a make-whole payment would or would not be warranted
 - These examples do not cover all types of costs that may be eligible for make-whole payments. Costs will be verified by NYISO MMA on a case-by-case basis

Example 1: Opportunity Cost

- **Scenario:** During a 4-hour NYISO SRE call, an External Installed Capacity Supplier bid its 50MW ICE of UCAP sold at -\$1000 in an effort to get scheduled by the NYISO software. During the SRE period, IESO's price for the supplier's proxy was \$800, NYISO's price for the supplier's proxy was \$700, and the NYISO MMA validated the External Installed Capacity Supplier's costs of supplying to be \$100/MWh.
 - Assuming the supplier was able to demonstrate that its sales to NYISO precluded additional sales to IESO that would have otherwise been possible, the make-whole payment for this scenario would be calculated as follows:

Supplier's hypothetical net revenue from selling to IESO = 4 hours x \$700 x 50MW = \$140,000

Supplier's actual net revenue from selling to NYISO = 4 hours x \$600 x 50MW = \$120,000

Make-whole payment = \$140,000 - \$120,000 = \$20,000

Example 2: No Make-Whole Payment

- Scenario: During a 4-hour NYISO SRE call, an External Installed Capacity Supplier bid its 50MW ICE of UCAP sold at -\$1000 in an effort to get scheduled by the NYISO software. During the SRE period, IESO's price for the supplier's proxy was \$800, NYISO's price for the supplier's proxy was \$900, and the NYISO MMA validated the External Installed Capacity Supplier's costs of supplying to be \$100/MWh.
 - This scenario would not warrant a make-whole payment, since the supplier would have recovered all of its costs from its NY energy market schedule.

Example 3: Negative Real-Time LBMP

- Scenario: During a 4-hour NYISO SRE call, an External Installed Capacity Supplier bid its 50MW ICE of UCAP sold at -\$1000 in an effort to get scheduled by the NYISO software. During the SRE period, NYISO's price for the supplier's proxy was -\$50, and the NYISO MMA validated the External Installed Capacity Supplier's costs of supplying to be \$100/MWh.
 - The make-whole payment for this scenario would be calculated as follows:

Total supplier Cost = $(\$100 * 50\text{MW} * 4 \text{ hours}) = \$20,000$

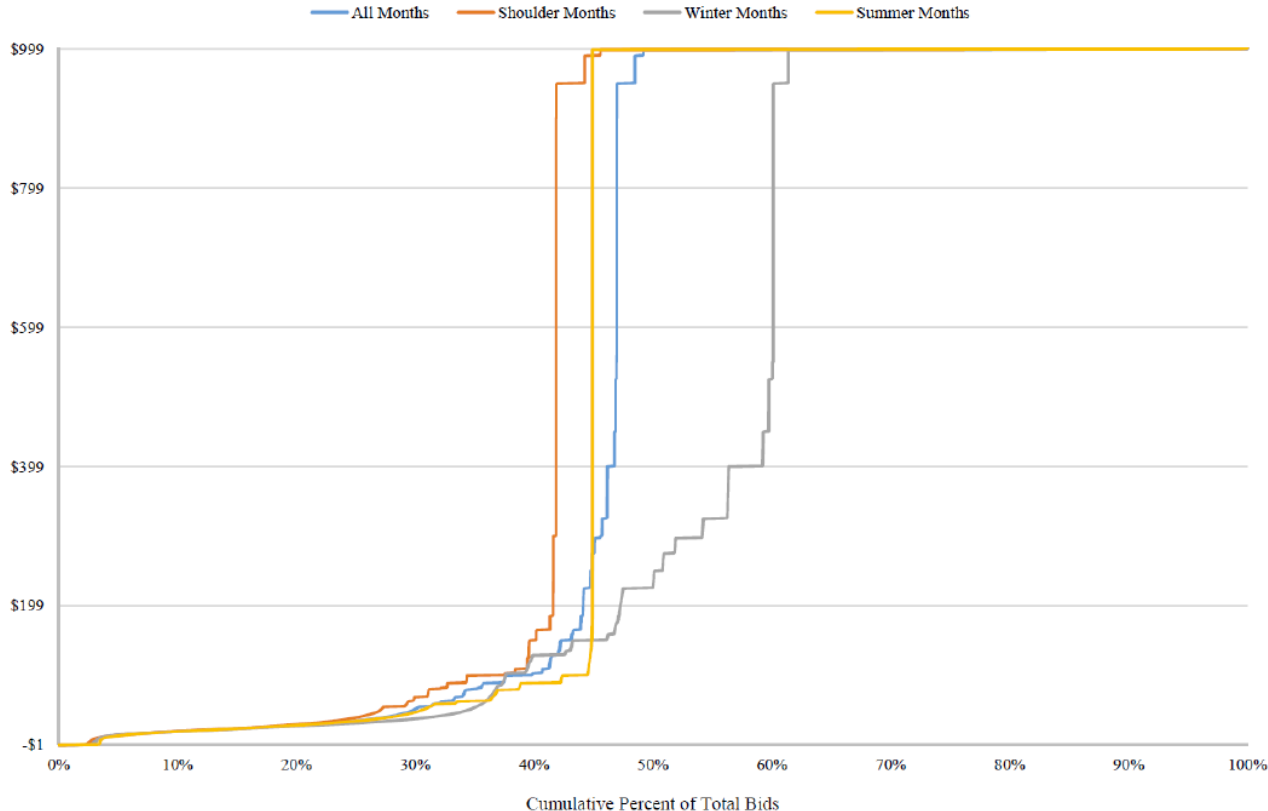
Total supplier "Revenue" = $(-\$50 * 50\text{MW} * 4 \text{ hours}) = -\$10,000$

Make-whole payment = $\$20,000 - (-\$10,000) = \$30,000$

Current SRE Challenge

- **If an external capacity resource is offline when the SRE is called, the external Control Area is not obligated to deliver the capacity transaction**
 - The external capacity resource is then required to submit a transaction (import) bid for evaluation by the NYISO market software
 - The external supplier can submit an energy bid (e.g., \$999/MWh) that is often not economic or reflective of its costs
 - Depending on the economics of this bid, the external capacity supplier may not be scheduled by NYISO software to provide energy for the SRE
 - Since external resources are not subject to NYISO's mitigation evaluations, the NYISO has no ability to validate external resource bids or issue physical withholding consequences

Cumulative Percent of External Capacity Bids



- Across the year, over 50% of hourly external Day-Ahead offers are at or very near the \$1000/MWh bid cap
- The average hourly Day-Ahead capacity offers from external suppliers exceeding \$990/MWh is 376MW

Source: 11/06/17 Analysis Group presentation to ICAPWG



An External Capacity Supplier will not be penalized if it fulfills the requirements on slide 10, but...

- **The resource does not get scheduled by the NYISO**
- **The resource cannot be scheduled due to a transmission issue that is within the bounds of the NYCA interfaces**

Generator and Transmission Outages External to the NYCA

- **An external capacity supplier that is unable to respond to a call due to a forced outage, *e.g.*, attempts but the equipment failed to start or was running and tripped offline, will not be subject to a penalty for non-performance during the SRE**
 - However, NYISO Operations would not remove the SRE and, if the resource associated with the transaction became available, then it would be expected to respond and fulfill the requirements on slide 17
 - The outage will impact the resource's EFORd
- **A failure to deliver energy in response to an SRE due to a transmission facility failure on the external control area system would be subject to a penalty for non-performance**
 - The NYISO views this risk to appropriately lie with external capacity suppliers
 - External capacity suppliers can appropriately bid the risk of incurring the new SRE penalty into their offer costs, just as other risks may be incorporated into bids

External Transmission Outages

- If an external transmission outage is located anywhere from the generator step-up to the point of withdrawal (for a controllable tie line) or the NY interface (for an AC interface), and the outage prevents an external capacity supplier from delivering energy to the NYCA during an SRE, then that capacity supplier will be subject to the new penalty

External Resource SRE Penalty Example

ICAP MW Sold (ICE)	SRE Call Duration (hours)	Spot Market Clearing Price (\$/kw-month)
100	4	10

- Scenario: An external capacity resource bid 75 MW for 2 hours and 100 MW for 2 hours (and there was only one SRE call in the month, and resource could have been online)

$$\begin{aligned} \text{Deficiency Charge Calculation} &= \\ 1.5 * (\$10/\text{kw-month}) * (1000 \text{ kW}/1\text{MW}) * ((50 \text{ MWh deficiency})/4 \text{ hours}) \\ &= \underline{\$187,500} \end{aligned}$$