New York ISO
Independent System Operator

Modeling Improvements for Capacity Accreditation: SCR Modeling

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June 7, 2023

Reposted with new slides #12-15 on 07-13-2023

Agenda

- **Exploratory Testing Methodology**
  - Hourly Response Rates for Existing SCRs
  - Representative SCR Unit Modeling
- **Next Steps**
- **Appendix**

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Exploratory Testing Methodology

Exploratory Testing Methodology – Existing SCRs

- **At the 04/27/2023 ICAPWG, the NYISO presented an exploratory testing methodology for modeling existing SCRs as duration limited resources with hourly response rates in the IRM model**
  - This modeling is intended to reflect the aggregate performance and staggered responses of individual SCRs during activations
  - The hourly response rates reflect the historical hourly performance of SCRs within each zone during mandatory events from Summer 2012 – Summer 2022
    - Hourly response rates are presented on the following slide
- **The duration limit of the zonal SCR resources will vary by load zone based on the maximum historical call length that has occurred in the zone since 2012**

	SCR Activation Duration Limit by Zone (hours)			
	A-E	F	G-J	K
Duration Limit	5	7	6	7

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Exploratory Testing Methodology– Existing SCRs

Response Rate by Hour of SCR Activation							
Zones	1	2	3	4	5	6	7
A-E[1]	79%	85%	83%	71%	70%		
F	75%	81%	84%	85%	84%	67%	64%
G-I[1]	59%	68%	70%	72%	74%	72%	
J	55%	61%	66%	68%	69%	66%	
K	50%	57%	62%	65%	65%	64%	53%

[1] Reflects capacity-weighted averages of zonal response rates. Zonal response rates will be used in the exploratory testing methodology

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Exploratory Testing Methodology – Existing SCRs

- **Zone J Modeling Example**
  - If an SCR activation is triggered in GE MARS, the MWs available from the existing SCRs in Zone J will vary across the hours of the activation based on the maximum modeled capacity for the month and the hourly response rates for Zone J

		Hour of SCR Activation					
Zone J		1	2	3	4	5	6
July Maximum Modeled Capacity (MWs)[1]	α	310.7					
Hourly Response Rates	β	55%	61%	66%	68%	69%	66%
MWs Available	$\gamma = \alpha * \beta$	171	190	205	211	214	205

[1] The maximum modeled capacities are calculated for each month using the total ICAP of SCRs enrolled in the zone in the same month of the prior year and the zonal ACL to CBL factor, as described on slide 12 of the 04/27/23 ICAPWG presentation. For example, the maximum modeled capacity for Zone J for July (310.7 MWs) was calculated by multiplying the Zone J SCR enrollments from July 2022 [417.5 MWs] by the Zone J ACL to CBL factor, as calculated for the 2023 IRM study [74.4%]

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Exploratory Testing Methodology – Representative SCR Unit

- **The representative SCR unit – which will be utilized for the CAF calculations in this exploratory testing – will be modeled as a 4-hour duration limited resource with 100% availability (*i.e.*, 100% hourly response rates across 4 consecutive hours)**
  - Under marginal capacity accreditation, Capacity Accreditation Factors should reflect the marginal reliability contribution expected from adding one additional unit of a Capacity Accreditation Resource Class to the system in order to send economically efficient signals for market entry and exit
  - Individual SCR units have a 4-hour performance obligation
  - The activation of the representative SCR unit will be tied to the activation of the existing SCRs in the same zone
  - The representative SCR unit will not be subject to an ACL to CBL derate

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Next Steps

Next Steps

- The NYISO anticipates returning to stakeholders in July to present preliminary results from the exploratory testing methodology

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Questions?

Appendix

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Supplemental Data

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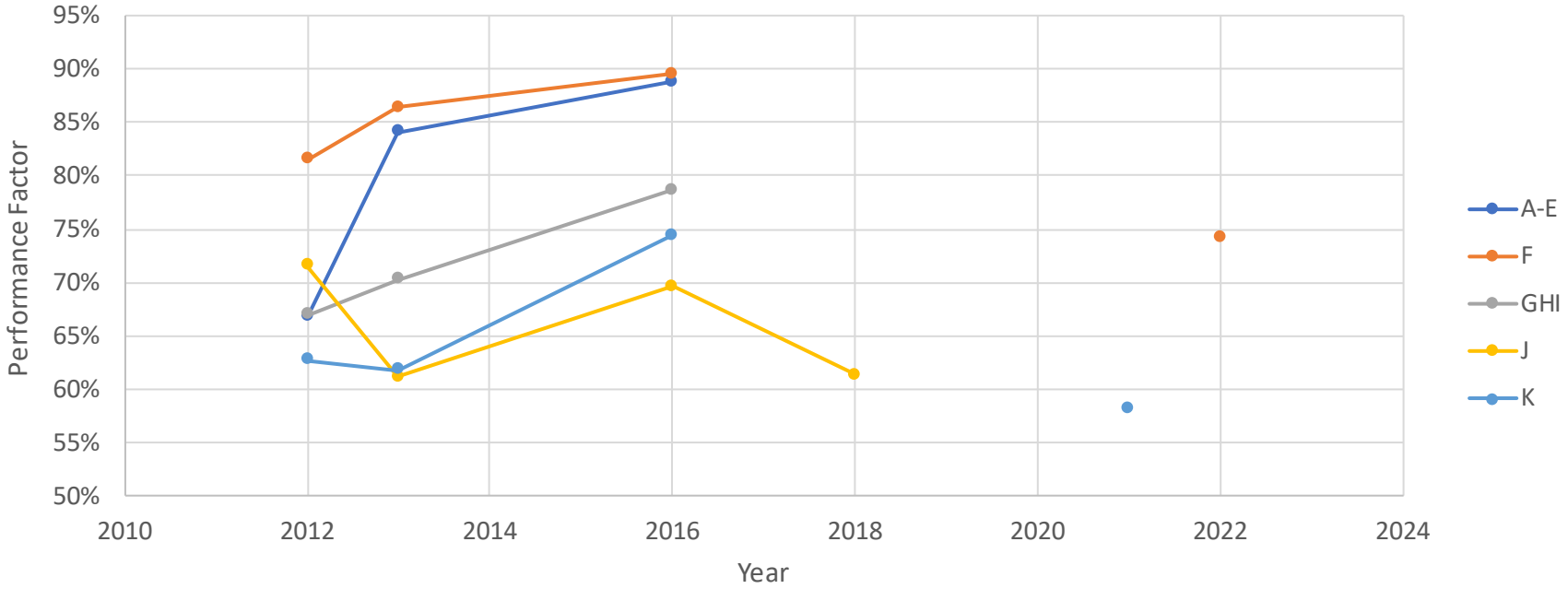
SCR Performance during Mandatory Events by Year (2012 - 2022)[1]



[1]Mandatory SCR events from 2012 - 2022 are listed on the following slide

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Mandatory SCR Events (2012 - 2022)

Mandatory Event	Zones
6/20/2012	C, G-J
6/21/2012	A-K
6/22/2012	G-K
7/18/2012	J
7/15/2013	G-K
7/16/2013	G-K
7/17/2013	G-K
7/18/2013	A-K
7/19/2013	A-K
8/12/2016	A-K

Mandatory Event	Zones
7/2/2018	J
8/28/2018	J
8/29/2018	J
8/11/2021	K
8/12/2021	K
8/13/2021	K
8/25/2021	K
8/26/2021	K
8/27/2021	K
7/19/2022	F
7/20/2022	F

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Percent of SRCs Submitting CBL Data for Mandatory Events (2012 - 2022)

Zones	Percent of Obligated MWs	Percent of Obligated Resources
A-E	97%	93%
F	94%	86%
G-I	94%	84%
J	89%	83%
K	85%	82%

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Background

Background: Modeling Improvements for Capacity Accreditation

- As part of the 2022 Improving Capacity Accreditation project, the NYISO identified that the functionality utilized in the current resource adequacy analysis -- used to establish New York State installed reserve margins and used as the basis of determining Capacity Accreditation Factors -- related to the modeling of and accounting for attributes, such as correlated fuel unavailability for non-renewable resources, long start up notification requirements, non-fuel-related correlated outages, etc., may limit the basis for identifying certain Capacity Accreditation Resource Classes (CARCs) and calculating Capacity Accreditation Factors(CAFs) for some resource types
  - Enhancing the model's functionality will enable more accurate calculations of the Resource Adequacy requirements needed to maintain reliability and the Capacity Accreditation Factors, which will reflect the marginal reliability contributions of each Capacity Accreditation Resource Class
- The Modeling Improvements for Capacity Accreditation project deliverable is the development of Functional Requirements due in Q4 2023

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Background: SCR Modeling

- **Special Case Resources (SCRs) are modeled in the IRM/LCR model. However, the current modeling of SCRs in the IRM/LCR model is not sufficiently aligned with the expected performance and obligations of SCRs in the NYISO's market. Therefore, SCRs cannot currently be treated as a separate CARC, for which to separately calculate CAFs, using the current modeling of SCRs**
  - The following slide highlights differences in the modeling of SCRs in the IRM/LCR model compared to the expected performance and obligations of SCRs in the NYISO's market
  - Until the IRM/LCR model reflects the expected performance and obligations of SCRs in the NYISO's market, SCRs will be assigned to the 4-hour Energy Duration Limitation Capacity Accreditation Resource Class
- **As part of this project, the NYISO will examine and recommend how to better reflect the expected performance and obligations of SCRs in the IRM/LCR study**
  - Changes to the design of the SCR program are not within the scope of this project. Discussions on the needs of demand side resources and DERs, and gaps of the current NYISO DR/DER programs will take place as part of the Engaging the Demand Side initiative.

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Background: SCR Modeling

- **IRM/LCR modeling**
  - SCRs are modeled as a step in the Emergency Operating Procedure (EOP)
    - GE MARS activates EOP steps if there is not enough capacity to supply load in the simulation
  - GE MARS does not consider certain market requirements such as advanced notice for SCRs
  - The SCR EOP is limited to a maximum of 5 activations per month
  - SCRs are modeled without output hour limitations and therefore can be available for the whole day
  - All SCRs in the NYISO are activated as part of the EOP
  - SCRs are modeled at a derated capacity based on zonal performance factors and zonal Average Coincident Load (ACL) to Customer Base Load (CBL) derates

- **Expected performance and obligations in the NYISO market**
  - Similar to an EOP, the NYISO activates SCRs only when the Day-Ahead Market indicates potential serious shortages of supply for the next day. (ICAP Manual Section 4.12.5)
  - The NYISO is required to provide SCRs with advanced notice at least 21-hours prior to activation
  - There is no maximum number of SCR activations per month in the NYISO market
  - When activated, SCRs have a minimum 4-hour performance obligation. SCRs are not expected to reduce load for the entire day
  - SCRs can be activated separately by LBMP zone
  - SCRs receive capacity payments based on the Aggregation's seasonal performance factor, which "recognizes over-performance by one SCR to compensate for underperformance by another SCR in the same SCR Aggregation in the same hour" (ICAP Manual Section 4.12.2)

Previous Discussions

Previous Discussions – SCR Modeling

Date	Working Group	Discussion Points and Links to Materials
January 26, 2023	ICAPWG	Modeling Improvements for Capacity Accreditation: Project Kick Off - https://www.nyiso.com/documents/20142/35880057/2023-01-26%20ICAPWG%20Modeling%20Improvements%20-%20Kick%20Off.pdf/c7ac6b6e-c90b-54b4-832d-ec6ecfc8f7ff
February 28, 2023	ICAPWG	SCR Modeling Kick Off - https://www.nyiso.com/documents/20142/36499713/2023-02-28%20ICAPWG%20Modeling%20Improvements%20-%20SCR%20Modeling.pdf/c1a52495-bc30-3e7c-f5c1-61c38f30fbe4
April 27, 2023	ICAPWG	Exploratory Testing Methodology for Existing SCRs: https://www.nyiso.com/documents/20142/37254128/2023-04%20ICAPWG%20Modeling%20Improvements%20-%20SCR%20Modeling.pdf/30382824-7468-24d2-e567-56c770d6a185

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Previous Discussions – Gas Constraints

Date	Working Group	Discussion Points and Links to Materials
January 26, 2023	ICAPWG	Modeling Improvements for Capacity Accreditation: Project Kick Off - https://www.nyiso.com/documents/20142/35880057/2023-01-26%20ICAPWG%20Modeling%20Improvements%20-%20Kick%20Off.pdf/c7ac6b6e-c90b-54b4-832d-ec6ecfc8f7ff
February 28, 2023	ICAPWG	Gas Constraints Kick Off - https://www.nyiso.com/documents/20142/36499713/Gas%20Constraints%2002_28_2023%20ICAPWG_Final.pdf/e258d867-12f9-8453-c93b-49bc94b8e803
April 27, 2023	ICAPWG	Estimate of Winter Gas Constraints and Market Design Considerations: https://www.nyiso.com/documents/20142/37254128/Natural%20Gas%20Constraints%202023_04_27_Final.pdf/0821aba8-bdcd-b1ce-96f3-2d8a740e1356
June 1, 2023	ICAPWG	Market Design Considerations: https://www.nyiso.com/documents/20142/37883690/Natural%20Gas%20Constraints%2006_01_2023_ICAPWG_Final.pdf/d479ea64-a0d0-86d1-388a-f93d01ff1e10

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Previous Discussions – Correlated Derates

Date	Working Group	Discussion Points and Links to Materials
January 26, 2023	ICAPWG	Modeling Improvements for Capacity Accreditation: Project Kick Off - https://www.nyiso.com/documents/20142/35880057/2023-01-26%20ICAPWG%20Modeling%20Improvements%20-%20Kick%20Off.pdf/c7ac6b6e-c90b-54b4-832d-ec6ecfc8f7ff
February 28, 2023	ICAPWG	Correlated Derates Kick Off - https://www.nyiso.com/documents/20142/36499713/Correlated_Derates_MIWG_022823_FINAL.pdf/35eaab46-740e-aed0-9e2d-2207c06a0659
May 8, 2023	ICAPWG	Ambient Adjustments and Emergency Capacity: https://www.nyiso.com/documents/20142/37431277/5%20Correlated_Derates_ICAPWG_050823.pdf/a1e9a0f4-d922-503d-06d0-682b49c46c4c

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Previous Discussions – Start Up Time

Date	Working Group	Discussion Points and Links to Materials
January 26, 2023	ICAPWG	Modeling Improvements for Capacity Accreditation: Project Kick Off - https://www.nyiso.com/documents/20142/35880057/2023-01-26%20ICAPWG%20Modeling%20Improvements%20-%20Kick%20Off.pdf/c7ac6b6e-c90b-54b4-832d-ec6ecfc8f7ff
April 27, 2023	ICAPWG	Start Up Time Kick Off - https://www.nyiso.com/documents/20142/37254128/Start-up%20notification%20time%20-%20ICAPWG%204.27.2023%20v0.2%20clean.pdf/b44eb773-6f7d-e895-e202-a12f2fb6e24e

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Our Mission & Vision

Mission

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

Vision

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

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