

Capacity Accreditation: SCR CAF Results and Proposal

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ICAPWG/MIWG

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Agenda

- Previous Discussions
- Background
- Capacity Accreditation Factors vs Resource Specific Derating Factors
- SCR CAF Results and Proposal
- Next Steps

Previous Discussions

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Date	Working Group	Discussion Points and Links to Materials
August 5, 2021	ICAPWG	Review of Existing Capacity Accreditation Rules: https://www.nyiso.com/documents/20142/23590734/20210805%20NYISO%20-%20Capacity%20Accreditation%20Current%20Rules%20Final.pdf
August 9, 2021	ICAPWG	Capacity Accreditation Proposal: https://www.nyiso.com/documents/20142/23645207/20210809%20NYISO%20-%20Capacity%20Accreditation%20Straw%20Proposal.pdf
August 30, 2021 & August 31, 2021	ICAPWG	Capacity Accreditation Proposal: https://www.nyiso.com/documents/20142/24172725/20210830%20NYISO%20-%20Capacity%20Accreditation_v10%20(002).pdf
September 28, 2021	ICAPWG	Comprehensive Mitigation Review Proposal and Tariff: https://www.nyiso.com/documents/20142/24925244/20210928_NYISO - CMR_Final.pdf/769828a1-f224-0140-240b-0762ec18efec
October 18, 2021	ICAPWG	Comprehensive Mitigation Review Proposal and Tariff Updates: https://www.nyiso.com/documents/20142/25440628/20211018%20NYISO%20-%20CMR%20v9.pdf/4475e775-159c-75c7-9cf8-7050dad9a363
October 29, 2021	ICAPWG	Comprehensive Mitigation Review Proposal and Tariff Updates: https://www.nyiso.com/documents/20142/25780701/20211029%20NYISO%20-%20CMR.pdf/ea8494b0-0860-b260-89b6-0c418d28a91d

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
November 2, 2021	ICAPWG	<p>NYISO CMR Consumer Impact Analysis: https://www.nyiso.com/documents/20142/25835955/CIA%20-%20Comprehensive%20Mitigation%20Review.pdf/36d447d4-5b33-8ab1-2654-90a529ff1dfe</p> <p>Potomac CMR Consumer Impact Analysis: https://www.nyiso.com/documents/20142/25835955/MMU%20ICAP%20Accreditation%20Consumer%20Impact%20Analysis%201-02-2021.pdf/637ba21e-db75-a4c1-5b41-f770dd26e529</p>
November 9, 2021	BIC	<p>Comprehensive Mitigation Review Proposal and Tariff: https://www.nyiso.com/documents/20142/25928340/5%2020211109%20NYISO%20-%20CMR%20v3.pdf/84d8b429-126c-68dd-0308-caa50886de92</p> <p>Comprehensive Mitigation Review Approved Motion: https://www.nyiso.com/documents/20142/25928340/110921%20bic%20final%20motions.pdf/785d5869-1e04-9f97-e330-e2e632ae7a9c</p>
November 17, 2021	MC	<p>Comprehensive Mitigation Review Proposal and Tariff: https://www.nyiso.com/documents/20142/26119798/05%20CMR.pdf/11217ade-152a-74a2-d478-6b5ae5e21207</p> <p>Comprehensive Mitigation Review Approved Motion: https://www.nyiso.com/documents/20142/26119798/111821%20MC_Final_Motions.pdf/bbf15d66-4108-7173-1596-9b20677914e6</p>

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
January 20, 2022	ICAPWG	<p>2022 Market Projects: https://www.nyiso.com/documents/20142/27799605/2022%20Projects%20Presentation.pdf/4553eb95-177d-7cbc-f2fe-7754b7c66644</p>
February 3, 2022	ICAPWG	<p>Improving Capacity Accreditation Plan: https://www.nyiso.com/documents/20142/28227906/Improving%20Capacity%20Accreditation%20Plan.pdf/92560e95-5703-4c57-45cb-7706c36f4656</p>
February 24, 2022	ICAPWG	<p>Improving Capacity Accreditation Project Kick Off: https://www.nyiso.com/documents/20142/28687884/Capa%20city%20Accreditation%20Kick%20ff%2002-24-22%20v7.pdf/5ab742c4-650b-5094-6a22-d41a2f29da6f</p> <p>MARS Review (GE Consulting): https://www.nyiso.com/documents/20142/28687884/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0224-v4.pdf/d302df1c-5607-16a8-ba01-fba700d5bbd1</p>
March 3, 2022	ICAPWG	<p>CMR Draft Deficiency Response: https://www.nyiso.com/documents/20142/28897222/CMR%20Deficiency%20Draft%20Responses%2003-03%20ICAPWG.pdf/0a3c8303-515e-7725-dee5-a9dda1398672</p>

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
March 16, 2022	ICAPWG	<p>Capacity Accreditation Resource Class Criteria, Resource-Specific Derating Factors, and Areas of Needed Change: https://www.nyiso.com/documents/20142/29177064/Capacity%20Accreditation%2003-16-22%20v7.pdf/b26e6a99-5f4e-29cc-c60c-47608c78c983</p>
March 31, 2022	ICAPWG	<p>Capacity Accreditation Representative Unit Modeling: https://www.nyiso.com/documents/20142/29607069/2%20CA%20Representative%20Unit%20Modeling%2003-31-22%20ICAPWG.pdf/1c3af8ac-625a-5066-3977-8c3d9ae0ddda</p> <p>ELCC and MRI Overview (GE): https://www.nyiso.com/documents/20142/29607069/3%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0331.pdf/08355c9a-d104-e1b6-6b8a-8266c61b74a3</p>
April 19, 2022	ICAPWG	<p>Capacity Accreditation Adjusted Resource Specific Derating Factors and External Resources: https://www.nyiso.com/documents/20142/30025560/04-19-22%20CA%20Adjusted%20Derating%20Factors%20and%20External%20Resources.pdf/5dd1f4b2-092d-6a6a-3b99-4d768ea6c5eb</p>

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
April 28, 2022	ICAPWG	<p>Preliminary Capacity Accreditation Resource Classes: https://www.nyiso.com/documents/20142/30276257/04-28-22%20Capacity%20Accreditation%20-%20Preliminary%20CARCs.pdf/c82c47c5-28c2-cf19-c602-16bf3cfc4aca</p> <p>Preliminary ELCC and MRI Results (GE): https://www.nyiso.com/documents/20142/30276257/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0428.pdf/3c761f16-7bc0-b469-b1e8-c2a69feb58ef</p>
May 24, 2022	ICAPWG	<p>Updated Preliminary CARCs and Annual Process to Establish CARCs: https://www.nyiso.com/documents/20142/30888946/3%2005-24-22%20Capacity%20Accreditation.pdf/cd61d855-f634-0fe8-6109-7d8c0547beda</p> <p>Additional Preliminary ELCC and MRI Results (GE): https://www.nyiso.com/documents/20142/30888946/2%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0524.pdf/0976330d-f4eb-4db3-2613-c8be9baf6452</p>
June 16, 2022	ICAPWG	<p>Sensitivity Scenarios and Seasonal CAFs: https://www.nyiso.com/documents/20142/31532822/2%20Capacity%20Accreditation%20v6.pdf/4ffe4fa9-bdaf-2c23-77be-d49ed04c5ea5</p>

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
June 28, 2022	ICAPWG	<p>Annual Peak Load Window (PLW) Review and Energy Duration Limitation Proposals: https://www.nyiso.com/documents/20142/31790818/06-28-22%20PLW%20and%20EDL%20Proposal.pdf/ffca7c8a-767e-3de1-9b46-404f661351b3</p> <p>Revised Shape-based Resource Results and ELR Modeling Functionality in MARS (GE): https://www.nyiso.com/documents/20142/31790818/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0628.pdf/999c7dfa-0b5d-a6bc-a57a-b35a1cda5aa4</p>
July 21, 2022	ICAPWG	<p>Capacity Accreditation: Project Schedule Update: https://www.nyiso.com/documents/20142/32356084/7-21-2022%20ICAPWG%20Project%20Schedule.pdf/958ef86a-12de-32a1-c115-5c1af39abb54</p>

Background

Background

- **The NYISO has begun stakeholder discussions to (1) develop the implementation details and technical specifications for establishing Capacity Accreditation Factors (CAFs) and Capacity Accreditation Resource Classes (CARCs) and (2) propose necessary ICAP Manual revisions**
 - The NYISO has contracted with GE Energy Consulting to support the NYISO and its stakeholders in the development of the implementation details and technical specifications
- **The 2022 Improving Capacity Accreditation project deliverable is a Q3 Market Design Complete**
 - Completion of the project is delayed. The NYISO is now targeting a Q4 Market Design Complete

CAFs vs Resource Specific Derating Factors

Capacity Accreditation Factors

- **CAFs will reflect the marginal reliability contribution of the representative unit of each CARC for each location that is evaluated**
- **The impact of the following characteristics would be captured by CAFs:**
 - Energy Duration Limitations
 - Correlated unavailability due to weather and/or fuel supply limitations
 - Synergistic and antagonistic effects
 - Start-up notification time limitations

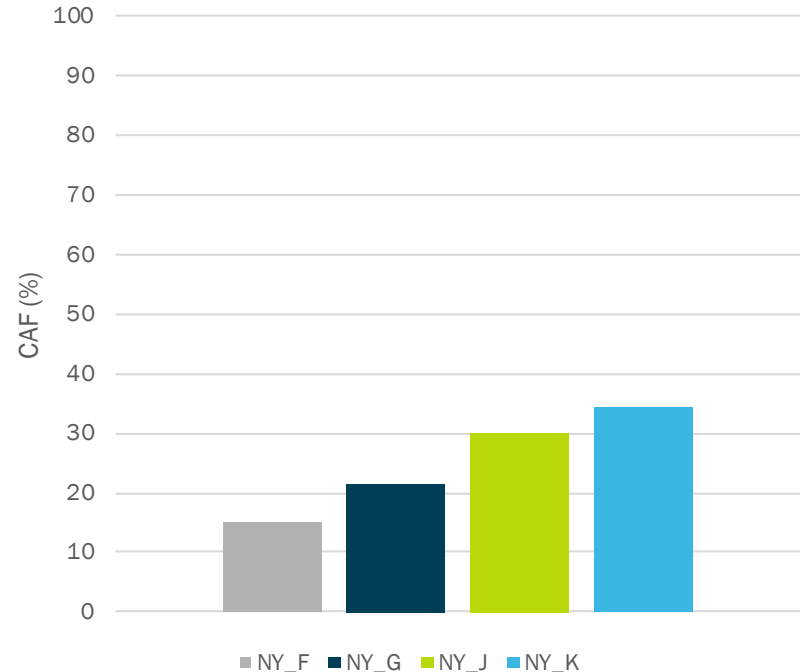
Resource Specific Derating Factors

- As discussed previously, resource specific derating factors will capture differences in availability that is specific to an individual resource and not captured in the CAF of the resource's CARC
 - Examples:
 - Forced outages, forced derates, failed starts, etc.
 - Resource output that is different from the modeled production profile of the CARC
- **Generally, a Resource's UCAP will be determined by combining the Resource's ICAP, CAF, and resource specific derating factor as illustrated below**
 - $UCAP = \text{Adjusted ICAP} \times (1 - \text{resource specific derating factor})$
 - Where:
 - $\text{Adjusted ICAP} = \text{ICAP} * \text{CAF}$
 - $\text{ICAP} = \min(\text{DMNC}, \text{CRIS})$
 - So, $UCAP = \min(\text{DMNC}, \text{CRIS}) * \text{CAF} * (1 - \text{resource specific derating factor})$
 - For more information on current resource-specific derating factors, see the [03/16/22 ICAPWG presentation](#)

SCR CAF Results and Proposal

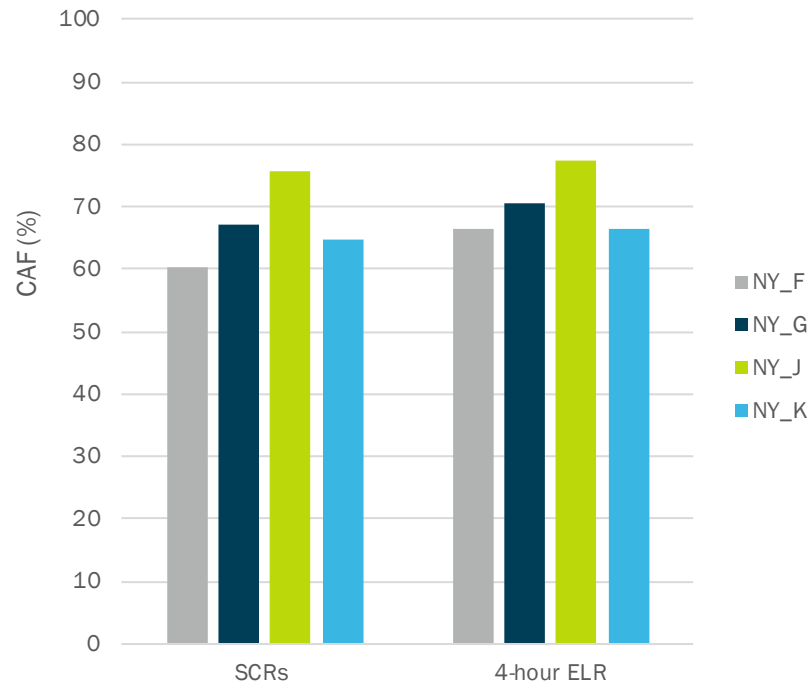
SCR Representation in the IRM/LCR Model

- **Existing SCRs are modeled as an Emergency Operating Procedure (EOP) in the IRM/LCR model**
 - The IRM/LCR model activates EOPs if there is not enough capacity to supply load in a given hour
 - The SCR EOP is subject to a maximum of 5 days per month call limit
 - Hourly run time limitations cannot be added to EOPs. Therefore, SCRs can be called for all hours of a day if needed
- **To initially calculate the CAFs of SCRs, the representative SCR unit was added to the existing SCR EOP in the base IRM/LCR model**
 - Thus, the representative unit was subject to the same modeling constraints of the existing SCRs in the IRM/LCR model (*i.e.*, 5 days per month call limit and no hourly run time limitation)
- **The average CAF of SCRs with this modeling was approximately 25% for the 100 MW step size**



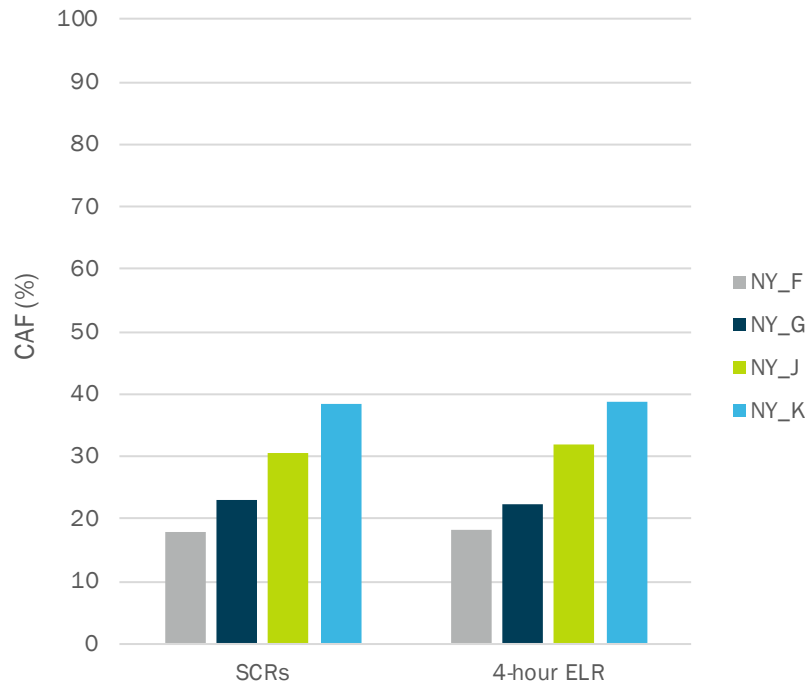
Expected Operations of SCRs in the Market – Representative Unit

- In the NYISO’s market, SCRs are expected to perform for a minimum of 4 consecutive hours and are not subject to a maximum number of calls per month
 - However, SCRs can only be called once per day in the NYISO market
- To test the CAF impact of modeling SCRs closer to their expected operations in the NYISO market, the representative SCR unit was modeled using the 4-hour energy-limited unit type in the IRM/LCR model, subject to a 1 call per day limit
 - SCR results shown on the right (“SCRs”) compared to the results for the 4-hour Energy Duration Limited CARC (“4-hour ELR”)
 - Average CAF is approximately 70% for both the SCRs and 4-hour ELR
 - The modeling of the existing SCRs in the base IRM/LCR model were not changed (*i.e.*, continued to be modeled as an EOP step, subject to the 5 days per month call limit and no hourly run time limitation)



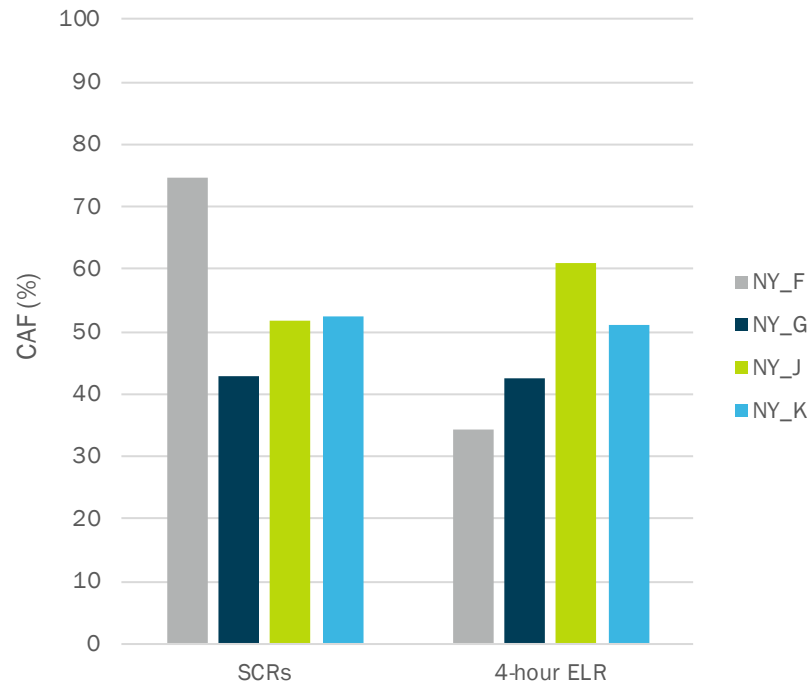
Expected Operations of SCRs in the Market – All SCRs

- When the existing SCRs in the IRM/LCR model are also modeled using the 4-hour energy-limited unit type, the average CAF of both the representative SCR unit and 4-hour ELR decrease to approximately 27%
 - Changing the modeling of the existing SCRs in the base IRM/LCR model lowered the starting LOLE to 0.092 compared to the 0.10 LOLE of the final LCR model
 - The timing and magnitude of loss of load events also changed, impacting the CAF value of both the representative SCR and 4-hour ELR units
 - The 4-hour energy-limited unit type in the IRM/LCR model is limited to starting at 1 pm
 - When used to model SCRs, this leads to all SCRs being called at 1 pm on days of need
 - Therefore, the addition of the representative SCR unit or 4-hour ELR, which also starts at 1 pm, provides less additional reliability value
 - In the market, the NYISO can call the SCRs of different zones at different times



Expected Operations of SCRs in the Market – All SCRs + Staggered Starts

- The NYISO tested the CAF impact of staggered zonal start times of SCRs by allowing Zone F SCRs to be called starting at 12 pm and Zone J SCRs to be called starting at 2 pm
 - Lowered the starting LOLE to 0.068
- Staggered start times of all SCRs changes the timing and magnitude of loss of load events in the base IRM/LCR model
 - The new timing and magnitude of loss of load events increases the marginal reliability contribution of the representative SCR and the 4-hour ELR units in all tested zones
 - Average SCR CAF: 55%
 - Average 4-hour ELR CAF: 47%
 - 1 pm start time retained for the representative 4-hour ELR in all zones
- Staggering SCR start times in different ways would produce different CAF values for SCRs and other resource types
 - Challenge: What is the correct staggering of SCR start times?



SCR CAF Proposal

- The prior CAF results show that the modeling of the existing SCRs in the IRM/LCR model has meaningful impacts on the CAF of SCRs and other resource types
- Due to the challenges and complexity of aligning the modeling of SCRs in the IRM/LCR model with the expected operations of SCRs in the NYISO's market, the NYISO will not be proposing SCR modeling enhancements as part of this year's effort
- SCR modeling enhancements will be evaluated and recommended as part of the 2023 Modeling Improvements for Capacity Accreditation project, as noted in the [07/21/2022 ICAPWG presentation](#)
- Until SCR modeling enhancements are implemented, the NYISO proposes to assign SCRs the CAF of the 4-hour Energy Duration Limited Capacity Accreditation Resource Class

Next Steps

Next Steps

- **The NYISO plans to return to the ICAPWG in August with a proposed path forward regarding seasonal vs annual CAFs and a proposed methodology for the annual assessment of the Winter Peak Load Window**

Questions?

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