New York ISO
Independent System Operator

Seasonal Derating Factor Considerations

Sushant Varghese

Manager, Resource Adequacy

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Background

- **In recent years, winter-specific assumptions have been progressively incorporated into the Installed Reserve Margin (IRM) study model as part of the ongoing modeling improvement initiatives.**
  - These improvements include seasonal load modeling, winter fuel availability constraint modeling, and seasonal topology limits.
- **Beginning with the 2026-2027 IRM study, Loss of Load Expectation (LOLE) was observed during the Winter Capability Period.**
  - Historically, the LOLE in the IRM study has only occurred during the Summer Capability Period.

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Generator Modeling in the IRM Study

- **The IRM study is conducted using the GE Multi-Area Reliability Simulation (GE MARS) software with the following approaches for generator modeling:**
  - Thermal resources are modeled with summer and winter capability (i.e., Capacity Resource Interconnection Service (CRIS)-adjusted Dependable Maximum Net Capability (DMNC)) and the annual transition matrix for outage probability using the most recent five-year Generator Availability Data System (GADS) data.
    - The transition matrix specifies how often a generator stays in and moves between different capacity ratings and is used by GE MARS to perform random outages draws during the simulations.
    - Winter fuel availability constraints are modeled separately to reflect potential fuel limitations during the peak winter months.
  - Intermittent Power Resources and Limited Control Run-of-River Resources are modeled using five years of historical hourly production profiles.
    - During the GE MARS simulation, a single historical year is randomly selected with equal probability, and that same weather year is applied consistently across all such production profiles.
  - Energy Limited Resources and Resources with an Energy Duration Limitation such as battery energy storage systems are modeled with seasonal capability (i.e., CRIS-adjusted DMNC) and a daily energy limitation using the GE MARS ELR functionality. During the simulations, these Resources will be utilized on an as-needed basis prior to Emergency Operating Procedures respecting the daily energy limitation.
    - Output window constraint is also modeled to defer the availability of the resources during the simulation due to the limitation of the ELR functionality identified in the 2021 White Paper on Energy Limited Resources Modeling. [1]

- **Based on these approaches, seasonality is captured in the generator modeling in the current IRM study model.**
  - The annual transition matrix is based on data for all seasons, and currently GE MARS does not have the capability to model seasonal transition matrix

[1] ELR Modeling White Paper (5/07/2021)

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Seasonal Zonal Derating Factors

- **To determine the IRM for the New York Control Area (NYCA), capacity is incrementally added to or removed from each Load Zone until the 0.1 Loss of Load Expectation (LOLE) criterion is met. The zonal allocation of these capacity adjustments is based on each Load Zone's share of excess Unforced Capacity (UCAP) relative to the total NYCA excess UCAP.**
  - This approach is described in NYSRC Policy No. 5-19, Appendix A.
- **Therefore, in order to calculate excess UCAP, zonal derating factors are needed to convert Installed Capacity (ICAP) to UCAP. Such conversion is conducted outside of GE MARS, and it is used to inform the addition or removal of capacity in the simulations.**
  - Currently the zonal derating factors are calculated by dividing UCAP over the summer ICAP, aggregated from all units within the zone.
    - For thermal resources, UCAP is calculated by applying summer ICAP and the average five-year annual EFORd.
      - Such EFROd includes all Forced Outages, including the 9300 outage events.
    - For Intermittent Power Resources and Limited Control Run-of-River Resources, UCAP is calculated by applying summer ICAP and the derating factor specified in Attachment N of the ICAP Manual.
      - Currently, Attachment N specifies calculating Intermittent Power Resource and Limited Control Run-of-River Resource derating factors using 5-year hourly production data during peak summer months (June, July and August) and the hourly LOLE weighting for the summer seasons.
      - In the 6/2/2026 NYISO ICAP Working Group meeting materials, the NYISO proposes revisions to Attachment N to provide the methodology to calculate seasonal translation factors [2]
    - For batteries, the most recent five-year NERC class average for pump storage hydro is used for the UCAP calculation due to lack of historical data.
- **The NYISO recommends developing seasonal zonal derating factors based on unit-specific seasonal inputs to support the IRM study process:**
  - $Summer\ Zonal\ DF = \frac{\sum(Unit\ Summer\ ICAP \times Unit\ Summer\ DF)}{\sum(Unit\ Summer\ ICAP)}$
  - $Winter\ Zonal\ DF = \frac{\sum(Unit\ Winter\ ICAP \times Unit\ Winter\ DF)}{\sum(Unit\ Winter\ ICAP)}$

[2] Proposed Changes to Attachment N of the ICAP Manual (6/2/2026 ICAPWG Meeting).

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Seasonal Zonal Derating Factors: Inputs

Current Approach

- **Use annual inputs:**
  - Annual EFORd for thermal resources
  - Summer ICAP for all resources
  - Summer availability factors for Intermittent Power Resources

NYISO Recommended Approach

- **Use season-specific inputs:**
  - Summer and winter EFORd for thermal resources
  - Summer and winter ICAP for all resources
  - Summer and winter availability factors for Intermittent Power Resources

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Seasonal Zonal Derating Factors: Preliminary Results for 2027-2028 IRM Study

- **Based on the recommendation, the NYISO has developed the preliminary seasonal zonal derating factors for the 2027–2028 IRM study.**
- **The preliminary seasonal zonal derating factors are based on the 2027-2028 IRM study assumptions received to date, including:**
  - Seasonal generator capability based on the 2026 Gold Book
  - Seasonal EFORd calculation for thermal resources based on the GADS data submission for the period of 2021-2025
  - Hourly production profiles for the Intermittent Power Resources and Limited Control Run-of-River Resources for the period of 2021-2025
  - Seasonal hourly LOLE weighting based on the final 2026-2027 Locational Minimum Installed Capacity Requirement (LCR) study base case (CHPE-in case) [3]
  - Additional assumptions update that may affect the seasonal zonal derating factors:
    - Generation inclusion and deactivation (Preliminary Base Case assumption)
    - Finalized production profiles for 2025 for Intermittent Power Resources and Limited Control Run-of-River Resources (expected for Final Base Case)

Load Zone	Preliminary Summer Derating Factor	Preliminary Winter Derating Factor
A	8.73%	7.67%
B	9.36%	9.51%
C	17.50%	17.40%
D	32.22%	28.55%
E	62.72%	50.34%
F	9.72%	12.33%
G	13.68%	15.00%
H	11.22%	16.28%
I	0.00%	0.00%
J	5.52%	5.96%
K	12.54%	13.10%

[3] See Peak Load Window for the 2026-2027 Capability Year (Updated 5/20/2026).

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Annualizing the Seasonal Zonal Derating Factors

- The NYISO recommends maintaining the current annual capacity addition or removal to be consistent with the annual IRM study structure and for the capacity requirement for both seasons, individually and in aggregate, to continue to meet the annual 0.1 LOLE criterion.
- Therefore, the NYISO recommends annualizing the seasonal zonal derating factors based on the portion of LOLE risk for each seasons from the prior Capability Year's final LCR study base case
  - The final 2026-2027 LCR study base case reported 73% LOLE risks in the summer season and 27% in the winter season [4]
  - In addition to this recommended approach, the NYISO also reviewed alternative annualization methods, including:
    - Status quo
    - Equal seasonal weighting

	Seasonal Derating Factors		Annualized Derating Factors		
Load Zone	*Summer Derating Factor*	*Winter Derating Factor*	Recommendation: LOLE Weight	*Status Quo*	*Equal Weight*
A	*8.73%*	*7.67%*	8.44%	*8.73%*	*8.20%*
B	*9.36%*	*9.51%*	9.40%	*9.36%*	*9.44%*
C	*17.50%*	*17.40%*	17.47%	*17.50%*	*17.45%*
D	*32.22%*	*28.55%*	31.23%	*32.22%*	*30.38%*
E	*62.72%*	*50.34%*	59.39%	*62.72%*	*56.53%*
F	*9.72%*	*12.33%*	10.43%	*9.72%*	*11.03%*
G	*13.68%*	*15.00%*	14.03%	*13.68%*	*14.34%*
H	*11.22%*	*16.28%*	12.58%	*11.22%*	*13.75%*
I	*0.00%*	*0.00%*	0.00%	*0.00%*	*0.00%*
J	*5.52%*	*5.96%*	5.64%	*5.52%*	*5.74%*
K	*12.54%*	*13.10%*	12.69%	*12.54%*	*12.82%*

[4] See Peak Load Window for the 2026-2027 Capability Year (Updated 5/20/2026)

Summary and Next Steps

- **Starting with the 2027-2028 IRM study, the NYISO's initial recommendation is to**
  - Maintain the current generator modeling in the GE MARS model
  - Maintain annual capacity removal or addition in the IRM study process for capacity requirement determination
  - To inform the annual capacity removal or addition, develop seasonal zonal derating factors using seasonal inputs and annualizing the seasonal zonal derating factors based on the seasonal LOLE risks portion from the prior Capability Year's final LCR study base case
  - Report the seasonal and annualized seasonal zonal derating factors in the Assumptions Matrix to improve transparency of IRM study inputs

- **Next Steps**
  - Seek ICS approval of a final recommendation for the 2027-2028 IRM study at the July 8, 2026 ICS meeting
  - If approved by the ICS, implement the recommendation starting with the 2027-2028 IRM Preliminary Base Case
  - Consider consistency and applicability of the IRM derating factor recommendations in the development of the seasonal Transmission Security Limit (TSL) floor methodology.
    - The NYISO plans to kick off the seasonal TSL floor methodology discussion at the NYISO's ICAP Working Group in June.

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Questions?

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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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