

Transmission Security Limit Floor for the Installed Capacity Market - Follow-up Discussion

Ross Altman & Yvonne Huang NYISO

ICAP Working Group

October 7, 2024

Agenda

- Background on Transmission Security Limits (TSL) in Installed Capacity (ICAP) Market
- Transmission Security Assessment and Resource Requirement
- Considerations for TSL floor calculation:
 - Derating Factor for Unforced Capacity (UCAP) to ICAP Conversion
 - UCAP Adjustment for UCAP to ICAP Conversion
 - Special Case Resources (SCRs)



TSL Floor Values in the ICAP Market

- TSL floor values allow certain aspects of transmission security to be considered in establishing the Locational Minimum Installed Capacity Requirements (LCRs).
 - The NYISO establishes TSL floors and LCRs for Load Zone J, Load Zone K, and G-J Locality.
- TSL floor values are established annually and serve as constraints in the LCR Optimizer for the applicable Resource Adequacy study that establishes the LCRs.
 - The differences between Resource Adequacy and Transmission Security studies were presented at the May 30, 2024 ICAP Working Group (ICAPWG) (Link to Presentation).
- The methodology for calculating TSL floor values has been updated in the past few years to better align the methodologies used in ICAP market practices and planning studies.
 - See <u>2022 ICAPWG Presentation</u> for summary of historical TSL floor methodologies
 - See 2023 ICAPWG Presentation for methodology changes implemented for the 2024 2025 Capability Year
- At the September 10, 2024 ICAPWG, stakeholder requested that NYISO review the transmission security considerations in the TSL floor calculation and planning studies.



Transmission Security Criteria and Practice

- The transmission security assessment generally establishes the maximum limit at which to transfer MW into a certain location without violating reliability criteria.
 - Generally, transmission security refers to the power flow studies conducted to identify reliability criteria violations on elements of the transmission system based on a set of creditable outages.
- The transmission security assessment uses the reliability criteria defined by the New York State Reliability Council (NYSRC).
 - For the New York Control Area (NYCA), a single element outage is applied beyond the initial condition of N-O and N-1, i.e., respecting N-1-O and N-1-1 (NYSRC Rules B.1 and B.2).
 - For Load Zone J, the system also needs to return to normal rating at the above outage condition, i.e., N-1-1-0 (NYSRC Local Reliability Rule G.1-R1).
- The transmission security assessment for the ICAP market, which is developed through the Bulk Power Transmission Limit study during the TSL floor calculation, and planning studies is conducted in a consistent manner.
 - Under the TSL floor calculation, the Bulk Power Transmission Limit applies the same criteria to the base case that reflects the latest and expected change on the system for the study Capability Year.
 - These criteria are applied in the transfer limit study performed within the Transmission Security Margin under the Reliability Needs Assessment (RNA) and Short-Term Assessment of Reliability for Year 1 to Year 10.



Transmission Security Resource Requirements

- To respect transmission security limitations, a certain amount of resources is needed within a location. Therefore, the resource requirement for location is calculated by deducting the transfer limits from the load.
 - UCAP Requirement due to Transmission Security = Load Transfer Limits
- The approach described above is to calculate both the UCAP Requirement in TSL floors and the Resource Need in planning studies.
 - At the <u>September 10, 2024 ICAPWG</u>, the NYISO recommended using the coincidence load forecast in the UCAP requirement calculation within the TSL floor.

	UCAP Requirement Calculation	G-J	NYC	LI
TSL Floor	Coincident Load Forecast	15,060	10,925	5,000
Calculation	Bulk Power Transmission Limit	4,350	2,875	275
- as presented at	Net Flow Adjustment	275		
9/10 ICAPWG	Offshore Wind Adjustment	0	0	38.4
	UCAP Requirement	10,985	8,050	4,763
TSM Summer Peak Assessment - as presented at 9/27 ESPWG	2025 Resource Need Calculation	G-J	NYC	LI
	Load Forecast	15,485	10,960	4,956
	Total Import Limit	5,736	3,889	900
	Loss of Source Contingency	-987	-987	-660
	Resouce Need	10,736	8,058	4,716

- For all localities, the UCAP Requirements are consistent between the TSL floor and RNA for Transmission Security (Transmission Security Margin).
 - For Load Zone K, the delta is due to differences in the load forecast and the offshore wind adjustment.
 - For G-J Locality, the different interface definitions between the two processes leads to a delta between the load forecasts, which will be offset by in total transfer limit. The net flow adjustment is included in the ICAP market calculation to account for Load Zone K's requirement in G-J Locality.

ICAP Market Signals and Planning Studies

- The technical considerations for transmission security, i.e., the power flow studies and the subsequent resource requirements, are consistent among the parameters used to establish ICAP market requirements and the planning studies.
- After the resource requirement is established, the TSL floor calculation and the planning studies processes are conducted with have different purposes and timelines.
 - Planning studies are conducted to identify reliability needs and solutions to ensure there are sufficient resources and transmission over the next 10-year period.
 - The TSL floor calculation is part of the annual Installed Reverse Margin (IRM)/LCR studies that are conducted 18-months in advance of the upcoming Capability Year to set ICAP market requirements for procuring sufficient capacity in the upcoming Capability Year.
- Reliability needs identified in the future may change over time due to uncertainties and may lead to implementation
 of reliability solutions. During the IRM/LCR study timeframe, assumptions may be refined, and the original reliability
 needs identified in a prior Capability Year's reliability studies may be addressed.
 - For example, a reliability need due to transmission security in Load Zone J for 2025 was identified during the 2023 Q2 Short-Term Assessment of Reliability and the evaluation of potential solutions resulted in the temporary retention of Gowanus 2 & 3 and Narrows 1 & 2 until CHPE comes online, which is expected in summer 2026. Today, these unit continue to be modeled as in service in the 2025 - 2026 IRM/LCR studies.
 - Therefore, the TSL floor for Load Zone J for the 2025 2026 Capability Year should include those units in the transmission security resource requirement to avoid signaling that there is a deficiency.



Consideration for Consistency

- The NYISO believes it is appropriate review the ICAP market practice and planning studies to ensure that the ICAP market signal from the TSL floor calculation is consistent with the transmission security resource requirement in the planning studies.
 - With a consistent approach, the transmission security resource requirement is expected to be consistent in the ICAP market practice and planning studies.
 - The values however may not be exactly the same due to certain interface definitions (e.g., G-J Locality), ICAP market structure consideration (e.g., net flow adjustment for the G-J Locality in the TSL floor), and uncertainties in long-term planning study assumptions (e.g., adoption of the NERC Class average for the derating factor).
- The NYISO does not believe, however, that it is appropriate to align the outcomes of the two processes as the objective for each process is different.
 - Planning studies aim to identify transmission security needs and develop a comprehensive plan to address those needs.
 - The TSL floor calculation aims to convert the transmission security requirement to an appropriate ICAP market signal, potentially taking into account the solutions to the reliability needs that have already been implemented.
 - Trying to convert the reliability needs directly into a TSL floor, without consideration of solutions and other process differences, will distort the ICAP market signal.
- Therefore, beyond the resource requirements in UCAP terms, the TSL floor calculation should reflect the appropriate conversion to the ICAP requirements for setting the LCRs, including:
 - Derating Factor for UCAP to ICAP conversion
 - UCAP adjustments for offshore wind
 - Treatment of SCRs



UCAP to ICAP Conversion (Derating Factor)

- The NYISO does not believe that including 9300 events in the UCAP to ICAP conversion under the transmission security framework is appropriate.
 - Based on the NERC reporting definition, a 9300 event refers to outages due to transmission system problems.
 - see <u>NERC 2024 cause code definition</u> for details
 - During the transmission security assessment, the relevant impact of transmission system outages is captured and reflected in the resource requirement.
 - If an outage on the transmission system results in violation of transmission planning criteria, the flow on the transmission system, i.e., the transmission limit, will be reduced to respect the criteria.
 - The reduced transmission limit will then lead to an increased UCAP requirement for the given location.
 - This consideration applies to both the ICAP market signals and the planning studies. However, the NERC class average derating factors used in planning studies do not have a mechanism for excluding 9300 events.
 - Planning studies use NERC class average derates to account for uncertainty in the planning horizon, reduce year-afteryear volatility due to the larger sample size, and avoid divulging confidential unit- specific derates that could be gleaned from planning studies.



UCAP to ICAP Conversion (Derating Factor)

- Excluding 9300 events in the 5-year derating factors of the TSL floor calculation aligns with the current ICAP market calculation.
 - Currently, 9300 event is not included in the calculation of ICAP market EFORd.
 - Using 5-year historical data provides potential year-over-year stability in the derating factors compared to the ICAP market EFORd that uses data from two past Capability Periods.
 - Alignment with the ICAP market calculation provides is more consistent with the current UCAP requirements
 used in the ICAP auctions.

UCAP Requirement Comparison		2024 - 2025 0	Capability Year	2023 - 2024 Capability Year			
TSL Floor Calculation	Locality	UCAP Requirement	TSL Floor w/o 9300	UCAP Requirement	TSL Floor w/o 9300		
	G-J	11,199	81.0% 11,982		85.4%		
	NYC	8,296	80.4%	8,410	81.7%		
	LI	4,843	105.3%	4,808	100.6%		
Actual Summer	I Summer Locality Requirement A		Actual LCRs	UCAP Requirement	Actual LCRs		
Requirement in Market	G-J	11,461.8	81.0%	12,526	85.4%		
	NYC	8,564.2	80.4%	9,032	81.7%		
	LI	4,850.8	105.3%	4,956	105.2%		

- For the past two years, the TSL floors have been binding for some of the localities.
- Based on the resulting LCRs, the summer UCAP requirements used in the ICAP market have been slightly higher than the UCAP requirement in the corresponding TSL floor calculation.
 - There is a natural discrepancy due to the inclusion of CAFs in the ICAP market EFORd. but it is not significant at this point.
 - The discrepancy can also account for the SCRs being added to the ICAP market requirements in TSL floor calculation.
- If 9300 events had been included in the derating factors, the TSL floors would have been higher, which would have lead to the use of even higher UCAP requirements in the ICAP market.



UCAP to ICAP Conversion (derating factor)

- 9300 events are included in the generator performance assumptions in the IRM study because the outages on transmission system are not reflected in the Resource Adequacy model
 - Only outages on the cables are modeled in Resource Adequacy.
- Therefore, it is not appropriate to include the 9300 events in the derating factors within the TSL floor calculation.
 - Including 9300 event in the derating factors would lead to 1~2% increase on the TSL floors (see appendix for details).
- The NYISO continues to recommend the proposed methodology presented at the September 10, 2024 ICAPWG for derating factor calculation in the TSL floor values for the 2025 – 2026 Capability Year:
 - For intermittent generators, Attachment N of the ICAP Manual will be applied.
 - For thermal generators, the average 5-year EFORd from GADS data excluding 9300 events will continue to be used.
- The NYISO also recommends continued review and monitoring of the applicability of the TSL floor methodology and consideration of potential changes in the future.



UCAP to ICAP Conversion (UCAP Adjustment)

- In the TSL floor calculation, the UCAP adjustment for offshore wind prior to applying the derating factor accounts for the significant differences in assumed availability in the Transmission Security and Resource Adequacy studies.
- The UCAP adjustment only applies to the TSL floor calculation because the TSL floor is included in the Resource Adequacy study during the LCR setting process.
- The NYISO continues to recommend making an UCAP adjustment for offshore wind resources in the TSL floor calculation.
- The NYISO also recommends continued monitoring of the changes in the resource mix for future methodology enhancements if adjustments are necessary for one or more additional resource classes or if study assumptions change.



SCRs

- SCRs are not considered in determining the transmission security resource requirements, in the TSL floor calculation and planning studies.
- SCRs are also not considered in addressing the 2025 transmission security need in Load Zone J in the RNA and Short-Term Assessment of Reliability.
- Therefore, the NYISO recommends adding SCR MWs back into the ICAP requirement in the TSL floor calculation for the 2025 – 2026 Capability Year.



Next Step

- Return to the late October and November 2024 ICAPWG meetings to provide the following updated inputs to the TSL floor calculation once they are available:
 - 5-year derating factor
 - Load Forecast
 - Bulk Power Transmission Limits
- Proceed with preliminary LCR study for the 2025 2026 Capability Year
- Consider if 9300 events can be accounted for in NERC class average derates used in planning studies



Questions?



Appendix



TSL Floor Comparison (derating factors)

Transmission Security Limit	Formula	9300 event removed from derating factor - as presented at 9/10 ICAP WG		9300 event included in the derating factor			
		G-J	NYC	LI	G-J	NYC	LI
Non-Coincident Load Forecast (MW)	[A] = IRM Study Assumption	15,274	11,171	5,080	15,274	11,171	5,080
Coincident Load Forecast	[P] = IRM Study Assumption	15,060	10,925	5,000	15,060	10,925	5,000
Bulk Power Transmission Limit (MW)	[B] = Studied	4,350	2,875	275	4,350	2,875	275
Net Flow Adjustment (MW)	[N] = Study Assumption	275			275		
Offshore Wind (MW)	[O] = Calculated	0	0	38.4	0	0	38.4
UCAP Requirement (MW)	[C] = [P]-[B]+[N]+[O]	10,985	8,050	4,763	10,985	8,050	4,763
UCAP Requirement Floor	[D] = [C]/[A]	71.9%	72.1%	93.8%	71.9%	72.1%	93.8%
5-Year Derating Factor	[E] = Calculated	5.90%	3.26%	8.37%	8.26%	5.82%	12.21%
Special Case Resources (MW)*	[F] = IRM Study Assumption	569.3	478.7	30.6	569.3	478.7	30.6
ICAP Requirement (MW)	[G] = ([C]/(1-[E]))+[F]	12,243	8,800	5,229	12,543	9,026	5,457
TSL Floor (%)	[H] = [G]/[A]	80.2%	78.8%	102.9%	82.1%	80.8%	107.4%



Our Mission & Vision

 \checkmark

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

