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Transmission Security Limit (TSL) Floor Values Calculation: Proposed Modifications for the 2025-2026 Capability Year

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September 10, 2024

Background

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TSL Floor Values in the Capacity Market

- **TSL floor values provide consideration for certain aspects of transmission security in establishing the Locational Minimum Installed Capacity Requirements (LCRs)**
  - Transmission security is assessed as part of the NYISO's reliability planning processes
  - The TSL floor values seek to ensure that the minimum capacity procurement requirements established for Localities do not require reliance on transfer amounts into a Locality that could create transmission security concerns during peak system conditions
  - Under the transmission security assessment, the NYISO studies bulk power transmission capability according to normal transfer criteria respecting a N-1-1 condition
- **TSL floors values are implemented as a constraint in the LCR optimizer**
- **TSL floor values are currently established for the G-J Locality, Load Zone J, and Load Zone K**

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TSL Floor Value Calculation Methodology

- **In general, the TSL floor value calculation methodology consists of the following four steps:**
  1. Deducting the bulk power transmission limit (studied using the transmission security methodology) from the peak load forecast to establish the Unforced Capacity (UCAP) required to meet the forecasted load
  2. Applying the zonal/locality 5-year derating factor to convert the UCAP requirements into Installed Capacity (ICAP) values
  3. Adding Special Case Resource (SCR) MW to establish the ICAP requirements
  4. Dividing the ICAP requirements by the peak load forecast. The resulting TSL floor values are expressed as a percentage.
- **The TSL floor value calculation methodology has been updated over the past few years to accommodate certain enhancements, changes in study inputs, and alignment with the reliability planning practices**

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2024-2025 TSL Floor Values

- **The table below reflects the final TSL floor values for the 2024 – 2025 Capability Year**
  - The table reflects the correction of the 5-year derating factor for Load Zone J (NYC)

Transmission Security Limit	Formula	G-J	NYC	LI	Notes
Non-Coincident Load Forecast (MW)	[A] = Given	15,274	11,171	5,080	[1]
Bulk Power Transmission Limit (MW)	[B] = Studied	4,350	2,875	275	[2]
Net Flow Adjustment (MW)*	[N] = Study Assumption	275			[3]
Offshore Wind (MW)	[O] = Given	0	0	37.5	[4]
UCAP Requirement (MW)	[C] = [A]-[B]+[N]+[O]	11,199	8,296	4,843	
UCAP Requirement Floor	[D] = [C]/[A]	73.3%	74.3%	95.3%	
5-Year Derating Factor	[E] = Given	5.40%	2.89%	8.85%	[5]
Special Case Resources (MW)	[F] = Given	526.7	442.4	35.3	[6]
ICAP Requirement (MW)	[G] = ([C]/(1-[E]))+[F]	12,365	8,985	5,348	
ICAP Requirement Floor (%)	[H] = [G]/[A]	81.0%	80.4%	105.3%	

*See Bulk Power Transmission Capability Report for study assumptions and adjustment details

[1] 2024 Fall Load Forecast

[2] Based on 2024 Locality Bulk Power Transmission Capability Report

[3] LI Bulk Power Transmission Limit Adjustment

[4] Difference in Resource Adequacy and Transmission Security UCAP Valuation

[5] 5-year Market EFORd based on the generation mix in the 2024-2025 IRM FB

[6] Modeled SCRs for 2024-2025

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Proposed Modifications for the 2025–2026 Capability Year

- **The NYISO proposes the following modifications to the TSL floor value calculation methodology for the 2025-2026 Capability Year:**
  - Coincident vs. non-coincident load forecast
  - 5-year derating factor calculation
  - Potential UCAP adjustments
- **Each of the proposed modifications is further discussed in the following slides**

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Proposed Modification: Load Forecast

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Coincident vs. Non-coincident Forecast

- Transmission security needs are determined based on the coincident load forecast. The TSL floor value calculation aims to establish constraints on LCRs that maintain transfers into Localities at levels that seek to avoid potential transmission security concerns during peak system conditions
- To provide improved alignment with the transmission security assessment , the NYISO proposes that the UCAP requirements used in the TSL floor value calculations reflect the coincident load forecast for the 2025–2026 Capability Year
- The TSL floor values, in percentage terms, will continue to use the non-coincident peak load forecast to maintain consistency with the use of non-coincident peak load forecasts for determining LCRs
  - LCR = ICAP requirement / non-coincident peak load forecast

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Proposed TSL Floor Value Methodology – Load Forecast Modification

- **The table below shows the preliminary calculation with the proposed methodology change, using the input values from the 2024–2025 Capability Year TSL floor value calculations**
  - The coincident peak load forecast (Item P) is used to determine the UCAP requirement MW (Item C), and the non-coincident peak load forecast (Item A) is used to determine the TSL floor value % (Item H)
  - The coincident peak load forecast values are consistent with the forecast used in the 2024–2025 installed reserve margin (IRM) study
  - The names/descriptions used for certain calculation inputs have been updated to provide better clarity

Transmission Security Limit	Formula	G-J	NYC	LI
Non-Coincident Load Forecast (MW)	[A] = IRM Study Assumption	15,274	11,171	5,080
Coincident Load Forecast	[P] = IRM Study Assumption	15,060	10,925	5,000
Bulk Power Transmission Limit (MW)	[B] = Studied	4,350	2,875	275
Net Flow Adjustment (MW)	[N] = Study Assumption	275		
Offshore Wind (MW)	[O] = Calculated	0	0	37.5
UCAP Requirement (MW)	[C] = [P]-[B]+[N]+[O]	10,985	8,050	4,763
UCAP Requirement Floor	[D] = [C]/[A]	71.9%	72.1%	93.8%
5-Year Derating Factor	[E] = Calculated	5.40%	2.89%	8.85%
Special Case Resources (MW)	[F] = IRM Study Assumption	526.7	442.4	35.3
ICAP Requirement (MW)	[G] = ([C]/(1-[E]))+[F]	12,139	8,732	5,260
TSL Floor (%)	[H] = [G]/[A]	79.5%	78.2%	103.5%

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Proposed Modification: 5-year Derating Factor Calculation

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Current 5-Year Derating Factor and ICAP Market Evolution

- **Under the current methodology, the 5-year derating factors used in determining in the TSL floor values are calculated using a "market" approach for converting ICAP to UCAP with historical data for the most recent 5 years**
  - Thermal generators use the average of the units' 5-year Equivalent Demand Forced Outage Rate (EFORd) from the Generating Availability Data System (GADS) data excluding 9300 events*
  - Intermittent generators use the average of the units' summer derating factors as used in the five most recent Summer Capability Periods, calculated in accordance with Section 3.4 of Attachment J to the ICAP Manual (see Appendix for further details)
- **With the introduction of Capacity Accreditation Factors (CAFs), CAFs are included in the market conversion from ICAP to UCAP**
  - The UCAP calculation for the thermal generator is not affected at this point because the current CAFs for thermal generation are 100%
  - The UCAP calculation for intermittent generators include the CAFs as required by Section 6.4 of Attachment J to the ICAP Manual (see Appendix for further details)

*9300 events are outages where the generator is undeliverable due to a transmission system outage

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Consideration of CAF Values

- **Under the current market approach for ICAP/UCAP conversions, unit UCAP is determined based on its marginal reliability contribution, using a combination of its CAF and unit specific derating factor**
- **The current market approach for ICAP/UCAP conversions that includes CAFs should not be introduced to the TSL floor value calculations**
  - The ICAP to UCAP conversion used for the TSL floor value calculations should reflect the average performance of the generation fleet, not the sum of marginal reliability contribution from the capacity accreditation method
  - Not using CAF values is consistent with the IRM study approach
    - Excluding CAFs avoids a recursive situation where CAF values are impacted by the previous year's CAF values

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NYISO Proposal: 5-Year Derating Factors

- **The NYISO proposes use of the methodology set forth in Attachment N of the ICAP Manual for intermittent resources as this methodology provides the basis for the derating factors for intermittent resources used in the NYISO's deliverability and NYSRC's IRM studies**
  - The intermittent generators use the average summer production output for the past 5 years based on the hourly loss of load expectation (LOLE) distribution from the prior year's finalized LCR study model (see Appendix for further details)
  - The Attachment N methodology is largely consistent with the current 5-year derating factor calculations for intermittent resources, except that the hours and weighting factors are determined by LOLE distribution rather than a fixed set of hours and weighting factors
- **Thermal generators should continue to use the average 5-year EFORd from the GADS data excluding 9300 events**
  - In the future, when fuel availability considerations are captured in the thermal generator CAFs, additional consideration may be required for the treatment for "lack of fuel" events

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NYISO Proposal: 5-Year Derating Factors (cont.)

- **The following are the preliminary 5-year derating factors calculated using the ICAP Manual Attachment N methodology for intermittent resources, with the updated underlying data for 2019 – 2023**
  - Load Zone J: 3.26%
    - The ICAP Manual Attachment N methodology has no impact on the Load Zone J derating factor as there are currently no intermittent resources in the Locality
  - Load Zone K: 8.37%
    - If the intermittent resources derating factor were calculated using the ICAP Manual Attachment J methodology, the updated 5-year derating factor would be 8.15%
  - G-J Locality: 5.90%
    - If the intermittent resources derating factor were calculated using the ICAP Manual Attachment J methodology, the updated 5-year derating factor would be 5.79%
- **Final calculation for the 2025-2026 Capability Year 5-year derating factors is expected in October 2024**

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Proposed Modification: UCAP Adjustment

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UCAP Adjustments

- Due to the nature of the studies, the UCAP of resource classes is different between resource adequacy studies and transmission security assessments
- For resources classes with a significant difference in assumed availability and a large magnitude of penetration, UCAP adjustments are warranted for the TSL floor value calculations
- The NYISO proposes to continue using UCAP adjustments for offshore wind
  - The 2024-2025 TSL floor value calculations included specific adjustments for the inclusion of offshore wind; the NYISO proposes continued use of an offshore wind adjustment for the 2025-2026 Capability Year
  - UCAP adjustments for other resource classes are not needed at this time as there is not another resource class that has both a large penetration and significant differences in assumed availability

https://www.nysrc.org/wp-content/uploads/2024/07/2025-2026-IRM-PBC-Assumptions-Matrix-v5.1-06262024-ICS-Draft-v4-clean33908.pdf

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NYISO Proposal: 2025-2026 Offshore Wind Adjustment

- The transmission security assessment currently assumes a 10% availability for offshore wind
- The 2025–2026 IRM study currently assumes a 38.2% availability for offshore wind
  - Changes from 37.6% availability assumed in the 2024-2025 IRM study are due to changes in the weighting factors of the hourly LOLE distribution reflected in the updated model used for the 2024-2025 LCR study (accounting for the correction of the Load Zone J TSL floor value)

Offshore Wind ICAP MW [X]	Availability Assumed in Transmission Security [Y]	Availability Assumed in 2025 – 2026 IRM study [Z]	UCAP Difference [O]= [X]*([Z]-[Y])
136	10.0%	38.2%	38.4

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Preliminary 2025-2026 TSL Floor Values

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Preliminary 2025–2026 TSL Floor Values

- **The table below shows the preliminary 2025-2026 TSL floor value calculations that include the proposed modifications discussed in the previous slides**

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

- Load forecast, bulk power transmission limit and net flow adjustments are consistent with the 2024–2025 TSL floor value calculations.
- The Coincident Load Forecast values are consistent with the forecast used in the 2024–2025 IRM study
- The preliminary 5-Year derating factors are calculated using the updated underlying data 2019–2023
- The SCR MW value reflects the assumptions proposed for the 2025 – 2026 IRM Final Base Case

*https://www.nysrc.org/wp-content/uploads/2024/08/2025-2026-IRM-FBC-Assumptions-Matrix-v0.0-09042024-ICS34669.pdf

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Next Steps

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Next Steps/Timeline

- September 2024: Receive and consider stakeholder feedback on the proposed modifications to the 2025-2026 TSL floor value calculations
- Late September 2024: Update preliminary 2025-2026 TSL floor value calculations with the results of the Bulk Power Transmission Limit Report and any further refinement of the proposed modifications
- Late October 2024: Present final 2025-2026 TSL floor values

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Appendix

- Intermittent UCAP Calculation Formula per ICAP Manual Attachments

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ICAP Manual Attachment J Section 3.4

$UCAP^{Q}_{gm}$, the amount of Unforced Capacity that Resource g is qualified to provide in month m, is calculated as follows:

$UCAP^{Q}_{gm} = ProdF_{gm} * NC_{gm} * Duration\ Adjustment\ Factor_{gm}$,

where:

$ProdF_{gm}$ is the production factor used in the calculation of the amount of Unforced Capacity that supplier g is qualified to provide in month m;

NC_{gm} is the nameplate capacity of Resource g that is applicable when determining the amount of Unforced Capacity that Resource g is qualified to provide in month m; and

$Duration\ Adjustment\ Factor_{gm}$ is the Duration Adjustment Factor for Resource g which is applicable for month m, pursuant to Section 4.1.1 of this *ICAP Manual*.

$ProdF_{gm}$, in turn, is calculated as follows:

$$\boldsymbol{ProdF_{gm}} = \sum_{h \in CPPH_{gm}} \left[\left(\frac{E_{gh}}{NC_{gh}} \right) \times WF_h \right]$$

Where:

$CPPH_{gm}$ is the set of all Summer Peak Hours during the most recent Summer Capability Period preceding the Capability Period containing month m (if month m is part of a Summer Capability Period) during which Resource g was available for commercial operation, or the set of all Winter Peak Hours during the most recent Winter Capability Period preceding the Capability Period containing month m (if month m is part of a Winter Capability Period) during which Resource g was available for commercial operation;

E_{gh} is the average amount of energy delivered to the NYCA transmission system by Resource g during hour h;

NC_{gh} is the nameplate capacity of Resource g that was applicable when determining the amount of Unforced Capacity that Resource g was qualified to provide in hour h; and

WF_h is the hourly weighting factor according to the table in section (c).

	Summer Peak Load Window		Winter Peak Load Window	
Hour Beginning	6 Hour	8 Hour	6 Hour	8 Hour
12		5.00%		
13	12.50%	10.00%		
14	18.75%	17.50%		5.00%
15	18.75%	17.50%		5.00%
16	18.75%	17.50%	18.75%	17.50%
17	18.75%	17.50%	18.75%	17.50%
18	12.50%	10.00%	18.75%	17.50%
19		5.00%	18.75%	17.50%
20			12.50%	10.00%
21			12.50%	10.00%

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ICAP Manual Attachment J Section 6.4

$$UCAP^{Q}_{gm} = min(NC_{gm}, CRIS_{gm}) * (1 - RSDF_{gm}) * Capacity\ Accreditation\ Factor_{gm},$$

Where:

$UCAP^{Q}_{gm}$ is the amount of Unforced Capacity that Resource g is qualified to provide in month m;

NC_{gm} is the nameplate capacity of Resource g that is applicable when determining the amount of Unforced Capacity that Resource g is qualified to provide in month m;

$CRIS_{gm}$ is the Capacity Resource Interconnection Service value for Resource g for month m established pursuant to the applicable deliverability requirements of NYISO OATT;

Capacity Accreditation Factor$_{gm}$ is the Capacity Accreditation Factor for Resource g which is applicable for month m, pursuant to Section 7.2 of this ICAP Manual;

$RSDF_{gm}$ is the resource specific derating factor of Resource g that is applicable when determining the amount of Unforced Capacity that Resource g is qualified to provide in month m. Until there are at least three (3) Resources within NYCA that comprise a single Capacity Accreditation Resource Class with at least sixty (60) days of historic operating data in the Prior Equivalent Capability Period Peak Load Window, Resources in that Capacity Accreditation Resource Class will have a derating factor of zero. The $RSDF_{gm}$ compares the *Average Capacity Factor*$_{gm}$ of Resource g for month m to the *Average Capacity Factor*$_{rm}$ for month m of the Representative Unit r used to calculate the *Capacity Accreditation Factor*$_{gm}$. The $RSDF_{gm}$ for Resource g for month m will be calculated using one of two approaches, as indicated below, in order to minimize the difference between $UCAP^{Q}_{gm}$ and the Adjusted Installed Capacity of Resource g for month m.

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ICAP Manual Attachment N

The following definitions are applicable to Intermittent Power Resources and Limited Control Run of River Hydro Resources:

$\boldsymbol{AF}_{gy}$: is the unit-specific availability factor used in the calculation of the unit-specific translation factor of supplier *g* in year *y*;

$$\boldsymbol{AF}_{gy} = \frac{\boldsymbol{1}}{\boldsymbol{H}} \sum_{\boldsymbol{h \in CYH}} \left[\left(\frac{\boldsymbol{E}_{ghy}}{\boldsymbol{NC}_{ghy}} \right) \times \boldsymbol{WF}_{h} \right]$$

Where:

$\boldsymbol{CYH}$ is the set of all hours during the months of June, July and August of the previous five Summer Capability Periods during which Resource g was available for commercial operation;

H is the total number of hours in *CYH;*

$\boldsymbol{E}_{ghy}$ is the total amount of energy delivered to the NYCA transmission system by Resource *g* during hour *h*, and year *y*;

$\boldsymbol{NC}_{ghy}$ is the nameplate capacity of Resource *g* in hour *h* and year *y;* and

$\boldsymbol{WF}_{h}$ is the hourly weighting factor corresponding to the most recent hourly LOLE distribution percentage table, available on the NYISO Capacity Accreditation web page (https://www.nyiso.com/accreditation).

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