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Independent System Operator

Transmission Security Limit Calculation: 2023 LCR Study

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Agenda

- Background on Transmission Security Limits (“TSLs”) in LCR Studies
- Review historic TSL Calculation methodologies
- Recommendation for new TSL Calculation
- Next steps

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Background

Background

- **TSLs are used in the LCR calculation process to implement a 'floor' in which the LCRs cannot fall below**
- **This results in a minimum capacity margin that a locality must maintain by considering transmission constraints**
  - Transmission constraints are studied by NYISO operations and then considered as bulk power transmission capabilities in the calculation process
  - The bulk power transmission capabilities are studied respecting N-1-1 conditions
- **Each of Zone J, Zone K and Zones G-J has a TSL**

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TSL Methodologies

Historic Methodology

- **Considers the load forecast, bulk power transmission capability and zonal EFORd as calculated in the IRM Study**
  - The IRM Study uses the transition rates for individual generators, based on the historic performance during the past 5 years
  - These transition rates are then weighted and aggregated to the zonal level to establish the zonal EFORd
- **Three main steps during the calculation for the TSLs:**
  1. Deducts transmission capability from the load forecast to establish the UCAP required to meet the forecasted load
  2. Applies the zonal 5-year EFORd to the UCAP requirements to convert MWs into ICAP
  3. Divides calculated ICAP requirements by the load forecast

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Historic Transition Rate Method

- Used in 2019, 2020 and 2021 LCRs

Transmission Security Limit Calculation	Formula	G-J	NYC	LI
Load Forecast (MW)	[A] = Given	15429.4	11217.1	5285.8
Bulk Power Transmission Capability (MW)	[B] = Given	3400	3200	350
UCAP Requirement (MW)	[C] = [A]-[B]	12029.4	8017.1	4935.8
UCAP Requirement Floor	[D] = [C]/[A]	77.96%	71.47%	93.38%
5-Year derating factor	[E] = Given	10.07%	9.17%	9.24%
ICAP Requirement (MW)	[F] = [C] /(1-[E])	13376.4	8826.5	5438.3
Transmission Security Limit	[G] = ROUND([F]/[A],1)	**86.7%**	**78.7%**	**102.9%**

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Background on the 2022 Interim Methodology

- During the 2022 LCR process, there was stakeholder interest in aligning the NYISO market TSL methodology with the methodology for the Transmission Security Margin in NYISO's 2020 Reliability Needs Assessment ("RNA") study
  - The Transmission Security Margin does not consider capacity from the SCRs as well as the generator EFORds
- 2022 TSLs in the LCR study were then aligned with Transmission Security Margin calculation by using the Interim Methodology

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2022 Interim TSL Methodology

- **Considers load forecast, bulk power transmission capability and SCRs in each locality**
- **Three main steps for the 2022 Interim TSLs:**
  1. The transmission capability is deducted from the load forecast, consistent with the historical methodology
  2. MWs from SCRs are then added to this number, as add-backs for Resource Unavailability, to establish the ICAP requirement to meet forecasted load
     - This assumption is made because SCRs do not contribute to transmission security under normal transfer criteria
  3. Divides the calculated ICAP requirements by the load forecast

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2022 Interim TSL Methodology

- Used in 2022 LCRs
- Resource Unavailability refers to the MWs of modeled SCRs in these Zones

Transmission Security Limit Calculation	Formula	G-J	NYC	LI
Load Forecast (MW)	[A] = Given	15,171	10,944	5,159
Transmission Security Limit (MW)	[B] = Studied	3,425	2,900	325
Resource Unavailibility (MW)	[C] = Given	492	407	37
ICAP Requirement (MW)	[D] = [A]-[B]+[C]	12,238	8,451	4,871
ICAP Requirement Floor (%)	[E] = ROUND([D]/[A],1)	80.70%	77.20%	94.40%

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Recommendation for 2023 TSL Methodology

Note: 2022 RNA *now* considers generator outages using the 5-year NERC class averages

Recommendation for Generator Outages: 5-Year Market EFORd

- **Market EFORd data would be pulled from GADS and is consistent with how the data is used in the market.**
- **This Market EFORd will consider the past 5-year historical performance**
  - Leverages NYISO specific data to represent resource performance
  - Aligns with the ICAP Market calculation
    - LCRs impacts both reliability and the markets
  - Excludes transmission related outages in the EFORd calculation
  - Potential for relatively greater year-over-year swing in the EFORd compared to the 5-year NERC class averages

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EFORd Comparison

- Market EFORd data considers 5 years worth of data pulled from GADS
  - Excludes transmission related outages
- Transition Rates consider 5 years of GADS data
  - Includes transmission related outages
- NERC Class Average EFORd considers 5 years worth of publicly available outage data

	Locality		
	G-J	J	K
Market EFORd	5.4%	4.5%	6.3%
Transition Rate	9.1%	7.2%	9.0%
NERC Class Average	7.3%	7.3%	8.7%

Note: These values represent 5 years worth of data

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Recommendation for SCR Consideration

- **Add SCR MWs to the ICAP Requirements calculation step**
  - This approach aligns previous methodologies
- **This recommendation aligns with how NYISO plans for Transmission Security**
  - SCRs are not counted on in transmission security under normal transfer criteria
- **SCR capacity can increase or decrease substantially year-over-year based on market needs**

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Combined Recommendation for 2023 TSL Methodology

- **Main steps in the recommended 2023 TSL Methodology:**
  1. Deducts transmission capability from the load forecast to find establish the UCAP required to meet the forecasted load
  2. Applies the zonal 5-Year Derating Factor to the UCAP requirements to convert MWs into ICAP
     - The 5-Year Derating Factor is based on 5-Year Market EFORd
  3. Add Special Case Resources MW to establish the ICAP requirements
  4. Divides calculated ICAP requirements by the load forecast

Transmission Security Limit Calculation	Formula	G-J	NYC	LI	Notes
Load Forecast (MW)	[A] = Given	15,223	11,001	5,031	[1]
Transmission Security Limit (MW)	[B] = Studied	3,425	2,900	325	[2]
UCAP Requirement (MW)	[C] = [A]-[B]	11,798	8,101	4,706	
UCAP Requirement Floor	[D] = [C]/[A]	77.5%	73.6%	93.5%	
5-Year Derating Factor	[E] = Given	5.4%	4.5%	6.3%	[3]
Special Case Resources (MW)	[F] = Given	496.6	417.5	33.7	[4]
ICAP Requirement (MW)	[G] = ([C]/(1-[E]))+[F]	12,968	8,900	5,056	
ICAP Requirement Floor (%)	[H] = [G]/[A]	85.2%	80.9%	100.5%	

[1] Load Forecast from 2022 Gold Book; Final forecasted values subject to change (Fall Load Forecast)
[2] These are 2021 values (2022 LCR Study,) Transmission Security analysis is underway for 2023 LCR study
[3] 5-year derating factor subject to change depending on final generation mix used for 2023 LCR Study
[4] Modeled SCRs are final

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Next Steps

Next Steps

- Update bulk power transmission capability values
- Calculate Preliminary LCRs using 2023 IRM PBC and updated TSLs
- Present Preliminary LCRs to ICAPWG later this month

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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