New York ISO
Independent System Operator

NYISO's Compliance Submittal for NYSRC Rule A.2 (R1)

Establishing Load Serving Entity Installed Capacity Requirements

A Report by the New York Independent System Operator

Presented to the Reliability Compliance Monitoring Subcommittee of the New York State Reliability Council

June 6, 2024

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Statement of NYSRC Rule A.2

The NYSRC Reliability Rule A.2 has the following requirements:

"**R1.** The *NYISO* shall annually establish *Load Serving Entity* (LSE) *installed capacity* (ICAP) requirements, including *Locational Capacity Requirements* (LCRs), in accordance with *NYSRC* rules and *NYISO* tariffs. *NYISO* analyses for setting LCRs shall include the following requirements:

R1.1 The *NYISO* LCR analysis shall use the IRM established by the *NYSRC* as determined in accordance with Reliability Rule A.1.

R1.2 The *NYISO* LCR analysis shall maintain a LOLE of 0.1 days/year, as specified by the Requirement A.1: R1.1.

R1.3 The *NYISO* LCR analysis shall use the software, load and capacity data, and models consistent with that utilized by the NYSRC for its determination of the IRM, as described in Sections 3.2 and 3.5 of NYSRC Policy 5, 'Procedure for Establishing NYCA Installed Capacity Requirements.'

R1.4 The *NYISO* shall document the procedures used to calculate the LCRs.

R1.5 The *NYISO* shall prepare a report for the next *Capability Year* describing the analyses for establishing (1) *LSE ICAP* requirements, and (2) LCRs for applicable *NYCA zones*, prepared in accordance with R1.1 through R1.3. The report shall include the procedures, factors, and assumptions utilized by the *NYISO* to determine these *LSE ICAP* requirements and LCRs."

The following compliance measure serves to fulfill the NYSRC Reliability Rule A.2 requirement R1. This measure states that:

"**M1.** The *NYISO* conducted an annual analysis to establish *LSE* and Locational Capacity Requirements for the next *Capability Year* in accordance with R1.1, R1.2, and R1.3 requirements. The procedures used to calculate LCRs were documented in accordance with R1.4 and a report prepared in accordance with R1.5."

Establishment of the Installed Reserve Margin (IRM)

The Installed Capacity Subcommittee (ICS) of the New York State Reliability Council conducted a technical resource reliability study in 2023 to determine the IRM for the 2024-2025 Capability Year. The Executive Committee of the NYSRC approved the Capability Year 2024–2025 IRM at 22.0% on December 8, 2023[1], which met the required Loss of Load Expectation (LOLE) criterion of 0.1 days per year as specified in NYSRC Rule A.1, Requirement R1.1.

[1] https://www.nysrc.org/wp-content/uploads/2023/12/2024-25-IRM-Resolution-12-8-2023-final.pdf

Establishment of LCRs

Using the approved IRM, the NYISO then determined the minimum Locational Capacity Requirements (LCRs). The NYISO's Operating Committee approved the original LCRs on January 18, 2024, based on the previously calculated Transmission Security Limits (TSL) floor values.[2] The NYISO later identified an error with the TSL floor value calculation for New York City and the updated LCRs were approved by the Operating Committee on April 19, 2024[3]. Details of the New York City TSL floor value error and the LCR correction are in the later section of this report. The LOLE resource adequacy criterion was maintained throughout this process, for both the original and the updated LCR values. The NYISO's calculations resulted in a New York City LCR of 80.4%, a Long Island LCR of 105.3%, and a G-J Locality LCR of 81.0%.

Locational Capacity and LSE References and Procedures

The NYISO Market Administration and Control Area Services Tariff ("Services Tariff")[4] provides the rules governing the NYISO markets. Capacity obligations for LSEs are contained in Section 5.11 and Locational Capacity Requirements are defined in Section 5.11.4. On October 5, 2018, FERC accepted proposed revisions to Section 5.11.4 of the NYISO Services Tariff, which provides the methodology that the NYISO uses for determining LCRs. This methodology utilizes an economic optimization algorithm to minimize the total cost of capacity for the NYCA.

The NYISO ICAP Manual[5] contains the procedures governing the Installed Capacity markets and auctions administered by the NYISO. Section 3 of the ICAP Manual addresses LSE requirements in procuring capacity to meet the NYSRC's annually set Installed Reserve Margin. Section 3.6.2, titled "Minimum Unforced Capacity Requirements for LSEs Serving Loads in a Locality," outlines the derivation of LSE locational Capacity Requirements. The ICAP Manual is available on the NYISO website.[6]

The NYISO LCR study utilizes the NYSRC-approved IRM, and associated database directed by the NYSRC as the starting point. The LCR methodology of economic optimization[7] meets the NYSRC's 0.1 days/year LOLE reliability standard while respecting the NYSRC-approved IRM as well as the Locality Transmission

[2] https://www.nyiso.com/documents/20142/42374122/04b_2024-2025%20LCR%20Report.pdf/5dc1e66b-ac36-84cb-b451-509e53461ca0

[3] https://www.nyiso.com/documents/20142/42519933/2024-2025-LCR-Report.pdf/04ee02a1-3a67-f4df-ff8a-0c1a5c9cf7da

[4] https://nyisoviewer.etariff.biz/ViewerDocLibrary/MasterTariffs/9FullTariffNYISOMST.pdf

[5] https://www.nyiso.com/documents/20142/2923301/icap_mnl.pdf/234db95c-9a91-66fe-7306-2900ef905338

[6] NYISO Home - NYISO

[7] https://www.nyiso.com/documents/20142/21537892/LCR-determination-process-2021.pdf/1bac4189-7bc1-5aa5-a00d-4f178074b5e8

Security Limits, and minimizing the total cost for the procurement of required capacity for the NYCA. The optimizer is a linear program that minimizes capacity costs based on the cost curves established offset by net Energy and Ancillary Services revenues[8]. These curves show the relationship between the magnitude of the requirement versus the cost in each of the Localities. Once a potential total cost solution is achieved in the program, it is tested by running the MARS software at the approved statewide IRM to determine the resulting LOLE. The least cost solution that satisfies all constraints is selected. Transmission security floors ensure that the program selects LCR requirements that are feasible from an operations perspective. These floors are called Transmission Security Limits and are based on the bulk power system transmission capability into each Locality as determined by power flow and contingency analysis. Each Locality LCR satisfies its respective Transmission Security Limit.

NYC Transmission Security Limit Floor Value Calculation Error

The NYISO discovered an error was made in the determination of the 5-year derating factor used for calculating the transmission security limit (TSL) floor value for Load Zone J for 2024-2025 Capability Year. Using the correct derating factor, the TSL floor value for Load Zone J for the 2024-2025 Capability Year should be 80.4% instead of the initially calculated 81.7% value. After discovery of the issue, the NYISO reported the matter to FERC and the Market Monitoring Unit (MMU) prior to issuing a "Notice of a Potential Market Problem" to the market on April 10, 2024, and commenced discussions with stakeholders at the Operating Committee on April 11, 2024, and the ICAP Working Group on April 15, 2024.

The NYISO conducted a supplemental analysis to determine that the updated Locational Minimum Installed Capacity Requirement (LCR) for Load Zone J should have been 80.4% and that the original TSL floor values for Load Zone K (105.3%) and the G-J Locality (81.0%) remained binding for their respective LCRs. The NYISO recommended revising the Load Zone J LCR for the 2024-2025 Capability Year to 80.4% and implementing the revised LCR beginning with the May 2024 ICAP Spot Market Auction. The revised LCR for Load Zone J was subsequently approved by the Operating Committee on April 19, 2024[9], and was implemented starting with the May 2024 ICAP Spot Auction.

[8] The term "offset" is defined in Section 5.14.1.2.2 of the *NYISO Market Administration and Control Area Services Tariff.*

[9] https://www.nyiso.com/documents/20142/42519933/2024-2025-LCR-Report.pdf/04ee02a1-3a67-f4df-ff8a-0c1a5c9cf7da

Requirements for LSEs

The NYISO has forecast a NYCA peak load of 31,765.6MW for the 2024–2025 Capability Year. The 22.0% statewide Installed Reserve Margin adopted by the NYSRC and the 31,765.6MW peak load forecast produced an Installed Capacity Requirement for the NYCA of 38,754.03 MW. The load forecast used is the peak value associated with the October Forecast for the IRM study. The ICAP market will employ a load forecast that has been updated further.

The forecast peak load, available capacity (based on CRIS-adjusted summer DMNC testing for existing units and currently available UDRs, SCRs and net imports), proposed resources, and the current statewide Installed Capacity Requirement produced the minimum LCRs for New York City, Long Island, and the G-J Locality, and the other values shown in Table 1.

Table 1 indicates that the statewide Installed Capacity Requirement for the New York Control Area (NYCA) and the Locational Capacity Requirements for New York City, Long Island, and the G-J Locality can be met with expected ICAP resources in 2024–2025 Capability Year.

Table 1 Capability Year 2024 – 2025 Peak Load and LCR Requirements

Locality	Forecast Peak Load (MW) (1)	LCR (%) (2)	ICAP LCR (MW) (3)	Available ICAP (MW) (4)	Expected ICAP (MW) (5)
New York City	11,170.6	80.4%	8,981.1	9,955.1	9,538.0
Long Island	5,080.3	105.3%	5,349.5	6,018.9	5,845.8
G-J Locality	15,273.5	81.0%	12,371.5	14,762.1	14,331.5
NYCA	31,765.6	122.0%	38,754.03	40,538.1	40,582.8

1. This is the forecasted peak load associated with the October Forecast for the IRM study.
2. This is the statewide Installed Capacity Requirement and Locational Capacity Requirements, expressed in terms of percentage of forecast peak load.
3. This is the statewide Installed Capacity Requirement and Locational Capacity Requirements, expressed in terms of MW of ICAP based on the Forecast Peak Load values specified in Table 1.
4. This is the sum of CRIS adjusted DMNC summer values for each existing unit based on 2022 testing for 2023 summer capacity plus UDRs, SCRs and net imports that are currently available.
5. This is the available capacity (4) plus expected additions, retirement, or re-rating of units, UDRs, SCRs and net imports using the best available information as of January 08, 2024.

Appendix A: LCR 2024 Report

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LOCATIONAL MINIMUM INSTALLED CAPACITY REQUIREMENTS STUDY

For the 2024–2025 Capability Year

Approved by NYISO Operating Committee, January 18, 2024 with revisions approved by the NYISO Operating Committee on April 19, 2024

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I. Recommendation

This report documents a study conducted by the New York Independent System Operator, Inc. (NYISO) to determine Locational Minimum Installed Capacity Requirements (LCRs) for the Localities of New York City (Load Zone J), Long Island (Load Zone K), and the G-J Locality (Load Zones G, H, I, and J) for the 2024–2025 Capability Year beginning May 1, 2024.

The New York State Reliability Council, L.L.C. (NYSRC) approved the 2024–2025 New York Control Area (NYCA) Installed Reserve Margin (IRM) at 22.0% on December 8, 2023. The NYISO then determined the LCRs for the 2024-2025 Capability Year using the IRM study database and the approved IRM, as well as additional analysis to address a subsequently identified error in the calculation of the transmission security limit (TSL) floor value for Zone J.

Based on the NYSRC IRM study base case for the 2024–2025 Capability Year, and the approved IRM identified above, and additional analysis to account for a correction to the TSL floor value initially calculated for Zone J for the 2024-2025 Capability Year, the NYISO's calculations result in a New York City LCR of 80.4%, a Long Island LCR of 105.3%, and a G-J Locality LCR of 81.0%.

IRM	J LCR	K LCR	G-J LCR
22.0%	80.4%	105.3%	81.0%

II. Starting Point Database

As its starting point, the NYISO LCR study utilized the NYCA IRM study directed by the NYSRC. The IRM study information is available on the NYSRC website.[1] The final IRM study base case for the 2024-2025 Capability Year maintains the loss of load expectation (LOLE) criterion at no more than 0.100 event-days/year with a statewide reserve margin of 23.1% and corresponding preliminary locational requirements of 72.7% and 103.2% for New York City and Long Island, respectively. In addition to the above technical results, this year's IRM study also identified a statewide reserve margin of 21.5% when respecting the applicable 2024-2025 Capability Year transmission security limit (TSL) floor values for Zone K and the G-J Locality, as well as an initially calculated TSL floor value of 81.7% for Zone J. The initially calculated TSL floor value for Zone J was subsequently determined to be incorrect because it was calculated using an incorrect Locality derating factor. The

[1] NYSRC New York Control Area Installed Capacity Requirement Reports:
https://www.nysrc.org/documents/reports/nysrc-new-york-control-area-installed-capacity-requirement-reports

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corrected TSL floor value for Zone J reflecting the appropriate Locality derating factor is 80.4%.

The NYISO follows the "Locational Minimum Installed Capacity Requirements Determination Process" to develop the LCRs for Zone J, Zone K, and the G-J Locality.[2] Pursuant to this procedure, the IRM study database is adjusted to the approved IRM (22.0%), and the target LOLE is established at the lesser of 0.100 event-days/year and the LOLE that results from the adjusted database corresponding to the approved IRM. The adjusted database corresponding to the approved 22.0% IRM and respecting the initially determined TSL floors for all three Localities resulted in the target LOLE for this year's LCR study at 0.089 event-days/year. Additionally, analysis was conducted to determine a revised LCR for Zone J reflecting the subsequent correction of the applicable TSL floor value.

III. Changes from Previous (1/23/2023) LCR report

Two major modeling and assumption changes were implemented in the base case of this year's IRM study: the adoption of reduced emergency assistance (EA) allowed from neighboring areas[3] and the implementation of topology updates due to the "AC Transmission" project.[4] On top of these modeling and assumption changes, this year's IRM base case also reflects the addition of 136 MW of new offshore wind resources and 90 MW of new in-front-of-the-meter solar resources. There were also 140.1 MW of resources reinstated in this year's IRM study that were removed in the IRM study for the 2023-2024 Capability Year. These resources were anticipated to be deactivated due to the New York State Department of Environmental Conservation (DEC) "Peaker Rule" but confirmed their intent to continue operating beyond June 2024.[5]

In addition to the changes in the IRM study base case for the 2024-2025 Capability Year, there were two changes implemented in this year's methodology for calculating the TSL floor values for the LCR study. The calculation was updated to account for the difference in forced outage rate utilized in the IRM study and the NYISO's reliability planning procedures as it relates to the new offshore wind resources modeled in this year's IRM study. The calculation was also updated to account for the

[2] Locational Minimum Installed Capacity Requirements Determination Process:
https://www.nyiso.com/documents/20142/21537892/LCR-determination-process-2021.pdf
[3] EOP Review Whitepaper Report:
https://www.nysrc.org/wp-content/uploads/2023/10/EOP-Review-Whitepaper-Report_FINAL_For_Posting.pdf

[4] 2024 – 2025 IRM Proposed MARS Topology Update:
https://www.nysrc.org/wp-content/uploads/2023/07/6.2_Topology-Update-ICS-0530202315816.pdf

[5] NYCA IRM Requirement Study 2024-2025 Final Base Case (FBC) Model Assumptions Matrix:
https://www.nysrc.org/wp-content/uploads/2023/10/IRM_FBCAssumptionsMatrix_V1.222498.pdf

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assumed net flow from Load Zone K to Load Zone J.[6]

IV. LCR Determination Process

The LCR calculation methodology utilizes an economic optimization algorithm to minimize the total cost of capacity for the NYCA, taking into account net cost of new entry (CONE) curves as shown in the table below. Such net CONE curves account for the applicable net Energy and Ancillary Services revenue offset.[7]

2024-2025 Net CONE Curves		
Location	LCR (%)	Net CONE ($/kW-yr)
NYCA	112.9	69.34
	115.9	70.97
	118.9	72.35
	121.9	73.66
	124.9	74.21
G-J	84.0	75.09
	87.0	77.25
	90.0	78.82
	93.0	80.26
	96.0	80.95
Zone J	80.6	144.12
	83.6	149.00
	86.6	150.98
	89.6	152.54
	92.6	153.65
Zone K	97.4	45.93
	100.4	55.40
	103.4	61.24
	106.4	64.19
	109.4	66.74

[6] Transmission Security Limit Floor Proposal: Capability Year 2024-2025: https://www.nyiso.com/documents/20142/39768278/TSL%20Floor%20Proposal%20-%20Capability%20Year%202024-2025.pdf
[7] The term 'net Energy and Ancillary Services revenue offset' is defined in Section 5.14.1.2.2 of the NYISO Market Administration and Control Area Services Tariff.

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Using this methodology, the NYSRC's LOLE reliability standard will be met while utilizing the NYSRC-approved IRM and maintaining capacity requirements greater than or equal to the applicable TSL floor values, as shown in the table below.[8] The initially calculated TSL floors for all three Localities were binding in this year's LCR study. As described below, additional analysis was conducted to determine the LCR for Zone J accounting for a subsequent correction to its TSL floor value.

Transmission Security Limit Floor Calculation	Formula	G-J	NYC	LI	Notes
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 to Transmission Limit (MW)*	[N] = Study Assumption	275			[3]
Offshore Wind (MW)	[O] = Given			37.5	[4]
UCAP Requirement (MW)	[C] = [A]-[B]+[N]+[O]	11,199	8,296	4,843	
UCAP Requirement Floor	[D] = [C]/[A]	73.32%	74.26%	95.33%	
5-Year Derating Factor	[E] = Given	5.40%	4.50%	8.85%	[5]
Special Case Resources (MW)	[F] = Given	526.7	442.4	35.3	[6]
ICAP Requirement (MW)	[G] = ([C]/[1-[E]))+[F]	12,364	9,129	5,348	
ICAP Requirement Floor (%)	[H] = [G]/[A]	81.0%	81.7%	105.3%	

[1] 2024 Fall Load Forecast[9]
[2] Based on 2024 Locality Bulk Power Transmission Capability Report[10]
[3] LI Bulk Power Transmission Limit Adjustment
[5] 5-year Market EFORd based on the generation mix in the 2024-2025 IRM FBC
[4] Difference in Resource Adequacy and Transmission Security UCAP Valuation
[6] Modeled SCRs for 2024-2025[11]

Following the approval of the LCRs for the 2024-2025 Capability Year by the Operating Committee on January 18, 2024, the NYISO identified that the Locality derating factor (also referred to as the "5-Year Derating Factor") of the 4.50% utilized in calculating the TSL floor value for Zone J was incorrect because it was based on the data for the incorrect five-year historical period (2017-2021 instead of 2018-2022). The appropriate Locality derating factor for Zone J reflecting data for the five-year data period from 2018-2022 was determined to be 2.89%. Correction of the Locality derating factor results in a TSL floor value for Zone J of 80.4% as identified in the table below.

[8] Transmission Security Limit Floor: Capability Year 2024-2025:
https://www.nyiso.com/documents/20142/40834869/Final%20TSL%20Floors%20-%20Capability%20Year%202024-2025.pdf

[9] NYSRC Fall Forecast Update:
https://www.nyiso.com/documents/20142/40206684/NYSRC%20Fall%20Forecast%20Update%20Updated%202023%20Weather%20Normalization%20&%20Proposed%202024%20IRM%20Forecast.pdf

[10] 2024-25 Locality Bulk Power Transmission Capability Report:
https://www.nyiso.com/documents/20142/40834869/2024-25%20Locality%20Bulk%20Power%20Transmission%20Capability%20Report.pdf

[11] Demand Response: Final Model Values for 2024 IRM Studies:
https://www.nysrc.org/wp-content/uploads/2023/07/2023-ICS_Final-SCR-Model-Values20598.pdf

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Transmission Security Limit Floor Calculation	Formula	G-J	NYC	LI	Notes
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 to Transmission Limit (MW)*	[N] = Study Assumption	275			[3]
Offshore Wind (MW)	[O] = Given			37.5	[4]
UCAP Requirement (MW)	[C] = [A]-[B]+[N]+[O]	11,199	8,296	4,843	
UCAP Requirement Floor	[D] = [C]/[A]	73.32%	74.26%	95.33%	
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]	12,364	8,985	5,348	
ICAP Requirement Floor (%)	[H] = [G]/[A]	81.0%	**80.4%**	105.3%	

[1] 2024 Fall Load Forecast [12]
[2] Based on 2024 Locality Bulk Power Transmission Capability Report [13]
[3] LI Bulk Power Transmission Limit Adjustment
[5] 5-year Market EFORd based on the generation mix in the 2024-2025 IRM FBC
[4] Difference in Resource Adequacy and Transmission Security UCAP Valuation
[6] Modeled SCRs for 2024-2025 [14]

The NYISO conducted subsequent analysis to determine the LCR for Zone J for the 2024-2025 Capability Year accounting for the revised TSL floor value of 80.4%. Consistent with the previous results, such analysis identified the updated TSL floor value for Zone J was binding for the 2024-2025 Capability Year. The binding TSL floor values for all Localities, including the corrected 80.4% for Zone J, combined with the NYSRC approved IRM at 22.0% results in a LOLE of 0.090 event-days/year, meeting the reliability criterion of not greater than 0.100 event-days/year.

V. Summary of Study

The calculations and analysis in this study utilize the NYISO process for setting the LCRs, as well as supplemental analysis to account for a subsequently identified correction to the TSL floor value for Zone J, with the NYSRC-approved statewide IRM of 22.0% for the 2024-2025 Capability Year.

Based on the NYSRC's final IRM base case for the 2024–2025 Capability Year, the applicable LOLE criterion is met with an LCR of 80.4% for the New York City Locality, an LCR of 105.3% for the Long Island Locality, and an LCR of 81.0% for the G-J Locality.

[12] NYSRC Fall Forecast Update:
https://www.nyiso.com/documents/20142/40206684/NYSRC%20Fall%20Forecast%20Update%20Updated%202023%20Weather%20Normalization%20&%20Proposed%202024%20IRM%20Forecast.pdf

[13] 2024-25 Locality Bulk Power Transmission Capability Report:
https://www.nyiso.com/documents/20142/40834869/2024-25%20Locality%20Bulk%20Power%20Transmission%20Capability%20Report.pdf

[14] Demand Response: Final Model Values for 2024 IRM Studies:
https://www.nysrc.org/wp-content/uploads/2023/07/2023-ICS_Final-SCR-Model-Values20598.pdf

Appendix B: LCR Determination Process

Locational Minimum Installed Capacity Requirements Determination Process

1. Introduction

1.1. This document describes the process[1] that NYISO follows to determine the Locational Minimum Installed Capacity Requirements[2] (LCRs) for the Localities, presently Zone J – New York City, Zone K – Long Island, and the G-J Locality (Zones G, H, I, and J).

2. Initial Conditions

2.1. The database available from the Installed Reserve Margin (IRM) study is used, adjusted to the IRM value approved by the NYSRC for the upcoming Capability Year.

2.1.1. The NYISO will use a Loss of Load Expectation (LOLE) that is the lesser of (a) 0.100 days/year and (b) the LOLE that results from the NYSRC Installed Capacity Subcommittee's adjustment to the IRM database (specified with three decimal point precision). This LOLE is referred to as the "target LOLE".

2.2. All NYISO runs under this process occur with the NYCA Minimum Installed Capacity Requirement set using the approved IRM.

2.3. The NYISO will utilize LCR economic optimization software ("LCR software"), constructed as follows:

[1] On October 5, 2018, FERC accepted proposed revisions to Section 5.11.4 of the NYISO's Market Administration and Control Area Services Tariff ("Services Tariff") that provides the methodology that the NYISO uses for determining LCRs. This new methodology utilizes an economic optimization algorithm to minimize the total cost of capacity for the NYCA. This new methodology will result in continuing to meet the NYSRC's 0.1 days/year LOLE reliability standard while respecting the NYSRC-approved IRM.

[2] Capitalized terms not defined herein have the meaning set forth in the Services Tariff.

$$Minimize:$$

$$Cost\ of\ Capacity\ Procurement = [Q_J + LOE_J] \times P_J(Q_J + LOE_J) + [Q_K + LOE_K] \times P_K(Q_K + LOE_K)$$

$$+[Q_{(G-J)} + LOE_{(G-J)} - Q_J - LOE_J] \times P_{(G-J)}(Q_{(G-J)} + LOE_{(G-J)})$$

$$+[Q_{NYCA} + LOE_{NYCA} - Q_{(G-J)} - LOE_{(G-J)} - Q_K - LOE_K] \times P_{NYCA}(Q_{NYCA} + LOE_{NYCA})$$

$$Subject\ to:$$

$$NYCA\ system\ LOLE \leq target\ LOLE$$

$$Q_{NYCA} = NYCA\ system\ peak\ load\ forecast \times (1 + NYSRC\ approved\ IRM)$$

$$Q_J \geq Q_{TSL(J)}$$

$$Q_K \geq Q_{TSL(K)}$$

$$Q_{(G-J)} \geq Q_{TSL(G-J)}$$

Wherein

$Q_J, Q_K, Q_{(G-J)}$ are the quantity of capacity, expressed in megawatts, required in J Locality, K Locality, and G-J Locality, respectively, which is the product of the Locality's non-coincident peak load forecast and the corresponding LCR values.

$Q_{TSL(J)}, Q_{TSL(K)}, Q_{TSL(G-J)}$ are the quantity of LCR floor restriction, expressed in megawatts, due to the transmission security limit for J Locality, K Locality, and G-J Locality, respectively.

Q_{NYCA} is the quantity of capacity, expressed in megawatts, required for NYCA, which is the product of NYCA system peak load forecast and the value of (1 + NYSRC approved IRM).

$LOE_J, LOE_K, LOE_{(G-J)}, LOE_{NYCA}$ are the quantity of level of excess condition, expressed in megawatts, for J Locality, K Locality, G-J Locality, and NYCA, respectively.

$P_J(Q_J + LOE_J), P_K(Q_K + LOE_K), P_{G-J}(Q_{(G-J)} + LOE_{(G-J)}), P_{NYCA}(Q_{NYCA} + LOE_{NYCA})$ are the price of capacity for the given quantity of capacity in J Locality, K Locality, G-J Locality, and NYCA, respectively (noting that the ICAP Demand Curve reset process calculates Net CONE at the level of excess condition).

2.3.1.1. These equations are used to determine LCRs such that the cost of capacity is minimized, while at the same time holding unchanged the NYSRC approved IRM, maintaining an LOLE of less than or equal to 0.100 days/year, and maintaining capacity requirements greater than or equal to the applicable Transmission Security Limit, the foregoing described herein.

2.3.2. The additional tables used to run the optimizer are appended to the IRM database referenced in step 2.1. The data and zonal capacity shifting specified in these tables will be consistent with those present in the final IRM database.

2.3.3. When identifying the price of capacity at the level of excess prescribed in Section 5.11.4(a) of the Services Tariff, cost curves established (a) in a Demand Curve Reset Filing Year will use the results of net Energy and Ancillary Services revenues determined in the quadrennial ICAP Demand Curve tariff processes and (b) in Demand Curve annual update years, all points on each cost curve will be determined by changing each point on the current Capability Year's cost curve to reflect the difference between the upcoming Capability Year's Net CONE value and the current Capability Year's Net CONE value.

2.3.4. Transmission Security Limits are determined using the equations and inputs specified in the table below

Transmission Security Limit Calculation	Units	Formula	G-J Locality	NYC	LI
Load forecast for the LCR Study	MW	[A] = User Input			
Bulk Power Transmission Capability	MW	[B] = User Input			
UCAP Requirement (MW)	MW	[C] = [A]-[B]			
UCAP Requirement Percent	(%)	[D] = [C]/[A]			
Locality derating factor	(%)	[E] = User Input			
ICAP Requirement (MW)	MW	[F] = [C]/(1-[E])			
Transmission Security Limit	**%**	**[G] = ROUND([F]/[A], to 0.1% increments)**			

2.4. The NYISO will present to stakeholders informational draft LCRs and accompanying preliminary input information, as available (such as the IRM Load forecast, bulk power transmission capability, derating factors, Transmission Security Limits, and Net CONE Curves), in the 4th quarter of the calendar year. This presentation will include discussion of the factors causing year-over-year changes in LCRs.

3. LCR Case Adjustments

3.1. The NYISO will solve for the target LOLE. That is, the NYISO will use a Loss of Load Expectation (LOLE) that is the lesser of (a) 0.100 days/year and (b) the LOLE that results from the NYSRC Installed Capacity Subcommittee's adjustment to the IRM database (specified with three decimal point precision).

3.2. The NYISO will identify any material capability changes.

3.2.1. Material capability changes, as used in this process, means individual changes that would increase or decrease generation, CRIS MW, or transmission transfer capability by 200 MW or greater.

3.3.2. Notify the NYSRC of any material capability changes.

3.3.3 If the NYSRC chooses to adopt the material capability change for the IRM, the same update will be made in the assumptions used by the NYISO to calculate the LCRs.

4. Determination of the Final LCR Values

4.1. Using the final LCR case, Net CONE Curves, and TSLs, run the LCR software to determine unrounded LCRs.

4.2. The LCR software returns results with multiple decimal point precision (i.e, unrounded LCRs). LCRs are set in 0.1 percentage point increments in order to be converted to Locational Minimum Unforced Capacity Values allocated to LSEs and implemented in the ICAP AMS. Therefore, in order to set the LCR values, there may be a need to round those values up or down to the neighboring 0.1 percentage point.

4.3. If rounding is utilized, the NYISO will test these resulting values by running the MARS model and verifying the LOLE achieves the target LOLE value in Section 2.

4.4. If necessary to achieve at least the LOLE, the NYISO will adjust the LCR values in 0.1 percentage point increments. For such adjustments, the NYISO will first adjust Localities whose LCRs were rounded downward in the step 4.1 above (e.g., a Locality whose LCR was rounded downward from 90.14% to 90.1%).

4.5. The NYISO will present the resulting LCRs to the NYISO Operating Committee.

4.6. The NYISO will post to its website the final LCRs, LCR Report, Transmission Security Limits, Net CONE Curves, and other applicable supporting data for the upcoming Capability Year.