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 use the latest NYISO ICAP Load forecast. 3.2.1. The forecast will affect the load shapes used.~~

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~~3.2.2.Update peak load data in the corresponding LCR software tables.~~

~~3.2.3.Run the LCR software.~~

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.

~~Introduce any material changes and run the LCR software.~~

3.3.2~~3~~.Notify the NYSRC of any material capability changes.

~~3.2.2.~~ 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 LCR~~s case~~.

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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.

~~4.1.~~4.2. The LCR software returns results with multiple~~two~~ 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.

~~4.2.~~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.

~~4.3.~~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%).

~~4.4.~~4.5. The NYISO will present the resulting LCRs to the NYISO Operating Committee.

~~4.5.~~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.