

Informational LCR Results

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ICAPWG

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NYISO, Rensselaer, NY

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Purpose

- **This presentation provides informational LCR results using updated Installed Reserve Margin study assumptions and the NYISO's FERC-accepted LCR calculation method**
 - This presentation builds on the 11/5/18 ICAPWG presentation on the same topic
 - The 11/5 and 10/18 ICAPWG slides are in the appendix
- **Next steps in setting LCRs**
- **Additional steps**

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Input assumptions

- **Installed Reserve Margin (IRM) study assumptions**
 - Consists of MARS input files
 - Referred to as the “IRM Final Base Case”**
- **Transmission Security Limits based on the 2019-20 bulk power transmission capability values and 2019 IRM Final Base Case derating factors**
 - Final load values will not be available until late December
- **2019-20 Capability Year Net CONE Curves**
 - Determined consistent with the public LCR determination process, which is posted on the NYISO website
 - Curves will be posted on the ICAP section of the NYISO public website (under “Reference Documents > LCR Calculation Process”)

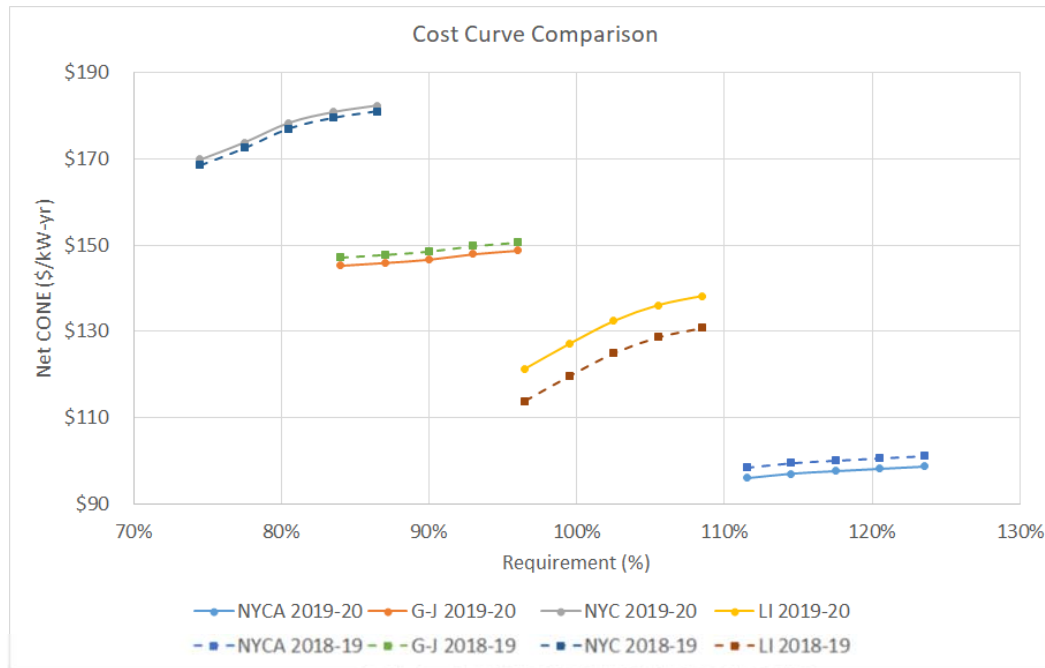
** The “IRM Final Base Case” requires the approval of the NYSRC (in December) and may require adjustment to align it with the IRM adopted by the NYSRC.

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2019-20 Capability Year Net CONE Curves



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Cost curves, cont'd

- Points were updated from the prior year curves by adding the change in the “Annual ICAP Reference Value” between Capability Year 2018-19 and Capability Year 2019-20 to each point on the 2018-19 cost curve
 - NYC Locality and LI Locality curves shifted upward
 - G-J Locality and NYCA curves shifted downward

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Informational LCRs for the IRM Final Base Case with 2019-20 Capability Year cost curves

2019 IRM Final Base Case	NYCA	G-J	NYC	LI	LOLE	Total Cost (MM\$)*
LCRs - 2019-20 cost curves	116.8%	93.6%	82.8%	103.5%**	0.100	\$5,004.0

* Total cost as calculated by the LCR production software, at the level of excess, considering Net CONE Curves.

** The TSL was binding

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Comparison with November 5th ICAPWG results

2019 IRM Final Base Case	NYCA	G-J	NYC	LI	LOLE	Total Cost (MM\$)*
LCRs - 2018-19 cost curves	116.8%	93.1%	83.2%	103.5%	0.100	\$5,001.9
LCRs - 2019-20 cost curves	116.8%	93.6%	82.8%	103.5%	0.100	\$5,004.0
<i>Change</i>	<i>0.0%</i>	<i>0.5%</i>	<i>-0.4%</i>	<i>0.0%</i>	<i>0.000</i>	

* Total cost as calculated by the LCR production software, at the level of excess, considering Net CONE Curves.

- **Both cases use the same MARS inputs**
 - Only the cost of capacity (i.e., cost curves) varied

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Next steps in setting LCRs

- NYSRC to vote on the NYCA IRM in December
- NYISO will incorporate the NYSRC IRM into the final LCR determination
- NYISO will incorporate the ICAP Load forecast into the final LCR determination
 - ICAP Load forecast is published in late December
- NYISO will present LCRs to the Operating Committee, likely at the January 17th meeting

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Additional steps

- **Final LCRs will be determined in accordance with the publicly posted LCR process document**
 - That process document was posted on 11/16/2018, and is available at this web link:
http://www.nyiso.com/public/webdocs/markets_operations/market_data/icap/Reference_Documents/LCR_Calculation_Process/LCR_determination_process.pdf
- **Final LCR inputs and the LCR report will be posted on the NYISO website**
 - http://www.nyiso.com/public/markets_operations/market_data/icap/index.jsp
 - Under “Reference Documents > LCR Calculation Process”

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Appendix

11/5 ICAPWG Slides

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Purpose

- This presentation provides informational LCR results using updated Installed Reserve Margin study assumptions and the NYISO's FERC-accepted LCR calculation method
- This presentation builds on the 10/18/18 ICAPWG presentation on the same topic
 - The 10/18 ICAPWG slides are in the appendix

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Input assumptions

- **Updated Installed Reserve Margin (IRM) study assumptions**
 - Consists of MARS input files
 - Referred to as the “IRM Final Base Case”**
- **Transmission Security Limits based on the 2019-20 bulk power transmission capability values and 2019 IRM Final Base Case derating factors (see next slide)**
 - Final load values will not be available until late December
- **Net CONE Curves from 2018-19 Capability Year**
 - 2019-20 Capability Year Net CONE Curves will be available before 11/30

** The “Final IRM Base Case” may be adjusted by and requires the approval of the NYSRC (in December).

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Updated TSL details

Informational TSL floor calculation, data as of 10/31/2018

Transmission Security Requirements	Formula	GHJ	NYC	LI	Source
Load Forecast (MW)	[A] = Given	15,831	11,585	5,346	2019-20 IRM Study load forecast (posted to 9/28 LFTF)
Transmission Security Limit (MW)	[B] = Given	3,200	3,200	350	NYISO 2019-20 TSL report (posted to 10/18 ICAPWG)
UCAP Requirement (MW)	[C] = [A]-[B]	12,631	8,385	4,996	
UCAP Requirement Floor	[D] = [C]/[A]	79.79%	72.38%	93.45%	
5-Year derating factor	[E] = Given	9.63%	9.67%	9.74%	FBC 5-year derating factor
ICAP Requirement (MW)	[F] = [C]/(1-[E])	13,977	9,283	5,535	
ICAP Requirement Floor	[G] = [F]/[A]	88.29%	80.13%	103.54%	

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Informational LCRs for the IRM Final Base Case

2019 IRM Final Base Case	NYCA	G-J	NYC	LI	LOLE	Total Cost (MMS\$)*
LCRs	116.8%	93.1%	83.2%	103.5%	0.100	\$5,001.9

* Total cost as calculated by the LCR production software, at the level of excess, considering Net CONE Curves.

- **NYC and G-J Locality LCRs increased relative to the IRM Preliminary Base Case, in large part due to modelling the B and C transmission lines as out-of-service**
 - “Case 1” in the 10/18 ICAPWG presentation
 - Changes from the preliminary base case to the final base case are found at: http://nysrc.org/pdf/MeetingMaterial/ICSMeetingMaterial/ICS%20Agenda%20212/AI%205.3%20-%202019_Assumption_Matrix_FBC_V4.pdf

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10/18 ICAPWG Slides

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Background

- On June 5, 2018, the NYISO filed with FERC tariff revisions that would put in place an updated method to of calculate LCRs
- On October 5, 2018, FERC issued an Order accepting revisions to the NYISO's Market Services Tariff that became effective October 9, 2018 (this has been referred to as "the Alternative LCR Method")

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Agenda & Schedule

■ This presentation provides:

- A description of the NYISO process for the remainder of 2018 to implement the new methodology described in Section 5.11.4 of the Market Services Tariff
- Illustrative LCR results using a preliminary IRM case

■ Schedule

- The NYISO plans to present informational LCRs based on the final IRM case as presented to the New York State Reliability Council
- The NYISO intends to post a revised LCR Calculation Procedure that describes the annual process to determine LCRs for the 2019 Capability Year and going
 - This will replace the existing posted G-J Locality LCR procedure
- The NYISO will calculate final LCRs for the 2019-20 Capability Year using the NYSRC- approved IRM and present these to the Operating Committee in January 2019

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2019-2020 Capability Year LCR process

- The NYISO will produce informational LCRs for certain IRM cases to inform stakeholders as it develops the LCRs under the newly accepted method. All such results will be informational only and presented as they become available
- NYISO will update necessary parameters and documentation in order to calculate final 2019-2020 LCRs in January 2019
 - MARS database
 - The final LCR database will start with the IRM Final Base Case, incorporate the December load forecast, and update for any material changes as described in the 2018 LCR process

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2019-2020 Capability Year LCR process (con't)

- Net CONE Curves
 - 2019-2020 Net CONE Curves used to calculate final LCRs will be updated from the 2018 market design cost curves using the 2019-2020 Capability Year updated ICAP Demand Curve reference points
 - 2019-2020 updated reference points (the starting point for 2019-2020 Net CONE Curves) will be available by November 30, 2018
- Transmission Security Limits
 - 2019-2020 Transmission Security Limits will be calculated from final peak Load, EFORd, and N-1-1 transmission study results
 - Final peak Load data will be based on the December Load Forecast
 - Final EFORd data will be from the final MARS database
 - N-1-1 transmission study results are shown in the TSL report posted with this presentation

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Inputs used to develop LCRs in this presentation

- **NYISO LCR production software**
 - The results presented were produced using software to implement the tariff methodology
- **A preliminary IRM MARS database (*i.e.*, Master Input File - MIF)**
 - The cases below use several MIFs, as described in subsequent slides
- **Net CONE Curves**
 - All LCR results in this presentation use the 2018 cost curves as previously presented to stakeholders including at the time of the BIC vote on the market design. See the appendix to this presentation, which is Slide 17 of the presentation at the following web link:
http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_icapwg/meeting_materials/2018-02-06/ICAPWG_2-06-18_AlternativeMethodsforLCRs_Final.pdf
- **Transmission Security Limits (“TSLs”)**
 - All LCR results in this presentation use updated values from previously calculated limits, as shown on the next slide
 - Previously calculated limits from the 2018 market design were previously presented to stakeholders including at the time of the BIC vote on the market design. See the appendix to this presentation, which is Slide 18 of the presentation at the following web link:
http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_icapwg/meeting_materials/2018-02-06/ICAPWG_2-06-18_AlternativeMethodsforLCRs_Final.pdf

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Updated TSL details

Preliminary Base Case TSL calculations

Transmission Security Requirements	Formula	GHIJ	NYC	LI	Source
Load Forecast (MW)	[A] = Given	15,815	11,474	5,323	2019 load from 2018 GB 2018 transfer limits
Transmission Security Limit (MW)	[B] = Given	3,000	3,175	350	
Minimum UCAP Needed (MW)	[C] = [A]-[B]	12,815	8,299	4,973	
UCAP Needed Percent	[D] = [C]/[A]	81.03%	72.33%	93.42%	
5 Year EFORD	[E] = Given	9.63%	9.67%	9.79%	8/21 PBC EFORD
ICAP Needed (MW)	[F] = [C]/(1-[E])	14,181	9,187	5,513	2019 PBC TSLs
ICAP Floor Requirement (TSLs)	[G] = [F]/[A]	89.67%	80.07%	103.56%	

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Case 1: LCRs presented to NYSRC on 9/5/2018

- Master Input File

- IRM Preliminary Base Case (PBC) MIF

Case: 2019 PBC	NYCA	G-J	NYC	LI	LOLE	Total Cost (MM\$)**
TAN 45 LCRs [†]	116.9%	94.9%*	79.2%	100.7%	0.100	\$4,980.1
Alternate LCRs	116.9%	89.7%***	80.1%***	103.6%***	0.100	\$4,973.2
<i>deltas</i>	0.0%	-5.2%	0.9%	2.9%	-	-\$6.9

* As-found condition for the G-J Locality given the PBC IRM and LCRs.

** Total cost as calculated by the LCR production software, at the level of excess, considering Net CONE Curves.

*** The LCR production software rounds LCRs to the nearest 0.1%. The TSL limit was binding for all locations.

† NYSRC Indicative LCRs



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Case 2: LCRs on the PBC with B and C lines out of service

- The New York State Reliability Council has indicated this sensitivity is a likely candidate for inclusion in the final IRM case
- **Master Input File**
 - IRM Preliminary Base Case (PBC) MIF, removing the B and C lines (from PJM to NYISO Zone J) from service

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Case 2: LCR results

Case: 2019 PBC w/o B&C lines	NYCA	G-J	NYC	LI	LOLE	Total Cost (MM\$)**
TAN 45 LCRs [†]	116.7%	96.8%*	81.8%	101.3%	0.100	\$5,034.0
Alternate LCRs	116.7%	92.7%	82.1%	103.6%	0.100	\$5,020.4
<i>deltas</i>	0.0%	-4.1%	0.3%	2.3%	-	-\$13.6

* As-found condition for the G-J Locality given the IRM and LCRs.

** Total cost as calculated by the LCR production software, at the level of excess, considering Net CONE Curves.

† NYSRC Indicative LCRs

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Informational October 2018 TSL update

TSL calculation using data available as of October 2018

Transmission Security Requirements	Formula	GHIJ	NYC	LI	Source
Load Forecast (MW)	[A] = Given	15,831	11,585	5,346	2019 IRM Load Forecast (9/28 LFTF)
Transmission Security Limit (MW)	[B] = Given	3,200	3,200	350	2019-2020 transfer limits
UCAP Requirement (MW)	[C] = [A]-[B]	12,631	8,385	4,996	
UCAP Requirement Percent	[D] = [C]/[A]	79.79%	72.38%	93.45%	
5 Year EFORD	[E] = Given	9.63%	9.67%	9.79%	8/21 PBC EFORD
ICAP Requirement (MW)	[F] = [C]/(1-[E])	13,977	9,283	5,538	
ICAP Floor Requirement (TSLs)	[G] = [F]/[A]	88.29%	80.13%	103.59%	informational TSLs

- The G-J Locality TSL decreased by more than one percentage point, other Locality TSLs were relatively unchanged
- These TSLs were not available when the preliminary IRM case was presented to the NYS Reliability Council (Case 1) and they were not used in Case 2
 - These TSL values are not expected to be a binding constraint in the optimization

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Next steps

- **The NYISO will return to ICAPWG in November and present informational LCRs based on the final IRM case, as presented to the New York State Reliability Council**
 - NYISO will also present materials to the NYSRC-Installed Capacity Subcommittee
- **The NYISO will calculate final LCRs in January 2019**
- **Final LCRs will be presented to the OC in January 2019**

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Questions?

Questions or comments can be sent to

deckels@nyiso.com

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- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system



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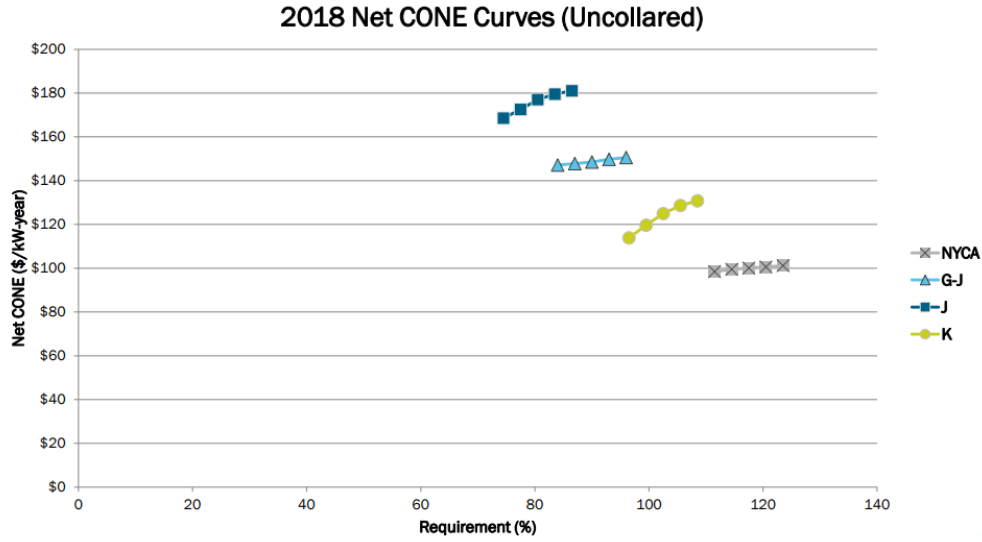
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Appendix

Net CONE curves from 2/6/18 BIC



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Transmission security limits from 2/6/18 BIC

2018 Transmission Security Limits

Transmission Security Requirements	G-J	Zone J	Zone K
Load Forecast (MW)	15,890	11,541	5,445
Transmission Security Import Limit (MW)	3,000	3,175	350
Transmission Security UCAP Requirement (MW)	12,890	8,366	5,095
Transmission Security UCAP Requirement (%)	81.1%	72.5%	93.6%
5 Year EFORd (%)	9.55%	9.05%	9.26%
Transmission Security ICAP Requirement (MW)	14,250	9,198	5,615
Transmission Security LCR Floor (%)	89.7%	79.7%	103.1%

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