EOP Review Whitepaper Progress Update

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NYISO

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Consideration for EA Limitation

- At the 5/28 ICS meeting, the NYISO concluded that the current emergency assistance (EA) assumptions result in optimistic support from the external areas in the IRM study
  - This is based on the review of the IRM data, operational experience, future outlooks of the entire Northeast region, and discussion with external areas
  - 5/30 ICS Presentation

- To consider limitations for the EA assumptions, the NYISO reviewed the current external area model and data and considered modeling options

- The presentation covers the following topics:
  - Current external area modeling in the IRM study
  - Modeling consideration
  - Data analysis update
  - Consideration for advancement of EA in the IRM model

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External Area Model

- The database for the external area are based on the NPCC regional reliability study which typically show large amount of surplus in the external areas
  - Significant adjustments are needed to be compliant with Policy 5 requirements

- Policy 5 requires the external areas to be modeled no better than the area's Resource Adequacy criteria and not higher than the referenced reserve margin.
  - The requirement requires that NYCA's IRM is not determined based on depending on extra capacity in external area beyond its adequacy criteria
  - This is in addition to the alignment of top 3 summer peak load days between NYCA and external areas

- However, such adjustments do not represent how capacity is maintained in the external area to achieve its respected reserve margin / RA criteria

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External Area Model (con'd)

- Significant adjustments were applied in the external data in the 2023-2024 IRM FBC in order to be compliant with Policy 5 requirements
  - The adjustments are not aligned with the delta between the anticipated margin and reference margin reported in the 2021 LTRA
  - The resulting modeled margins for external area are also not aligned with the areas' reference margins based on respected RA study

Area	Modeled in the 2023-2024 IRM FBC				2023 Margins (established – 2021 LTRA)	
	Load	Adjustments (on top of removal of shape-based units)	Margins	LOLE	Anticipated (Net Demand vs. Firm Capacity)	Reference (Based on Individual Area Study)
IESO	24,227	-5,370	114.6%	0.103	117.4%	115.9%
ISONE	28,555	-4,900	109.7%	0.102	130.0%	113.4%
HQ	39,469	+1,775	108.8%	0.108	111.9%	110.8%
PJM	149,941	-28,800	114.4%	0.173	136.8%	114.4%

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Modeling Considerations

- To improve the modeling with more limiting EA assumptions, a number of options have been considered:
    1. Improve the external area data to reflect more detailed representation of the external systems
    2. Increase the targeted LOLE for external area under Policy 5 adjustment (e.g. 0.2 LOLE instead of 0.1 LOLE)
    3. Including EOPs in the external area modeling during Policy 5 adjustments
    4. Implement additional limits on topology to restrict EA flows

- The NYISO consider the following factors in screening the modeling options:
    - <u>Feasibility</u>: is it possible to implement the modeling option?
    - <u>Seasonality</u>: is it possible to support winter modeling?
    - <u>LFU Bin Specific</u>: is it possible to accommodate different assumptions for different LFU bins?
    - <u>Goal of Policy 5</u>: is it going to achieve the goal of Policy 5 of avoiding overdependence on external areas given the current model provides too optimistic EA support during the IRM simulation?
    - <u>Justifiable and Repeatable</u>: Is it based on a set of analysis/processes that can be repeated over time?

- Based on the above considerations, the NYISO proposes to proceed with modeling option 4 to implement additional limits on topology to restrict EA flows
    - Focusing on the analysis and processes that supports the additional topology limits

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Modeling Considerations (con'd)

Options / Considerations	1. Improve Data - *Get better and more detailed external data*	2. Increase LOLE - *Model the external area at higher LOLE*	3. Model EOPs - *Include the EOPs in the external area during Policy 5*	4. Topology limits - *Add limits to transfer capabilities into NYCA*
Feasibility	• Limited control over source data • Lead time required to coordinate • Not able to replicate external's own RA study	• Can be implemented easily	• Can be implemented if EOP data is available	• Can be implemented easily
Seasonality	• Depends on the seasonal representation of external data	• The annual LOLE criteria will not facilitate seasonal assumptions	• The EOP steps are applied annually and will not facilitate seasonal assumptions	• Topology limits can be seasonal specific
LFU Bin Specific	• Depends on the LFU bin specific modeling in external data	• The annual LOLE criteria will not facilitate LFU bin specific assumptions	• LFU bin specific assumption can be facilitated if structured in the EOP data • Same application across all LFU bins is the current default	• Topology limits can vary by LFU bins
Goal of Policy 5	• May not address the issue of overly optimistic EA support in the current model	• Likely address the issue of overly optimistic EA support in the current model	• Including EOPs will result in holding more MW in external areas (except for IESO) and therefore will lead to more optimistic EA support compared to the current model	• Likely address the issue of overly optimistic EA support in the current model
Justifiable and Repeatable	• Owners are on the external areas to submit representative data	• Higher than required criteria is arbitrary	• Owners are on the external areas to provide up-to-date EOP data	• Depends on the analysis supporting the additional topology limits

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Historical Data Analysis

- **As discussed at the 5/30 ICS meeting, NYISO to perform review with the historical data of extra reserves available in the external areas**
  - The extra reserves data for each of the external areas is extracted for the period of 2021-2023
    - Historical data for PJM is only available for 2021-2023
  - NYCA load as % to peak load forecast is also extracted for the same period
  - Such extra reserves are the available reserve MW beyond an area's reserve requirements
    - Data from the IESO is adjusted to account for the Industrial Conservation Program due to the magnitude of impacts

- **The NYISO reviews the amount of extra reserves during NYCA's high load period, both at the aggregated level and at the individual area level**
  - This approach is similar to the 2017 External Area Whitepaper

- **NYISO plans to present the review of the historical data at the next ICS meeting**
  - The revised timeline is due to the delay in receiving data from PJM

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Regional Future Conditions

- However, it is important to note that analysis with historical data will not reflect certain designed weather conditions (e.g. LFU Bin 1 or 2) or emergency conditions
  - Assessment with future conditions need to be considered

- The Reliability Assessment conducted by NPCC and NERC shows low operating margins in Ontario and New England for summer 2023 at all forecast levels
  - Low operating margin indicates that the area may need to rely on operating procedures and support from other neighbors to maintain reliability
  - Ontario may need to rely on more than 2,000 MW of non-firm supply from other areas should the known outages cannot be rescheduled

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Regional Future Conditions (con'd)

Table 4-4: New England Operable Capacity Forecast (MW)

Week Beginning June 25, 2023	50/50 Forecast	90/10 Forecast	Above 90/10 Forecast
Installed Capacity (+)	28,869	28,869	28,869
Net Interchange (+)	1,030	1,030	1,030
Dispatchable DSM (+)	447	447	447
Total Capacity	30,346	30,346	30,346
Peak Demand Forecast (-)	24,664	26,479	28,154
Interruptible Load (+)	0	0	0
Known Maintenance & Derates (-)	346	346	346
Operating Reserve Requirement (-)	2,305	2,305	2,305
Unplanned Outages (-)	2,800	2,800	2,800
Operating Margin	231	-1,584	-3,259
Operating Margin (%)	0.9	-6.0	-11.6

Table 4-6: Ontario Operable Capacity Forecast[22] (MW)

Summer 2023	50/50 Forecast	90/10 Forecast	Above 90/10 Forecast
Installed Capacity (+)	38,273	38,273	38,273
Net Interchange (+)	223	223	223
Dispatchable DSM (+)	687	687	687
Total Capacity	39,183	39,183	39,183
Interruptible Load (+)	0	0	0
Known Maintenance & Derates (-)	13,690	14,704	14,722
Operating Reserve Requirement (-)	1,401	1,401	1,401
Unplanned Outages (-)	1,565	873	873
Peak Load Forecast (-)	22,439	24,420	27,021
Operating Margin	88	-2,438	-5,058
Operating Margin (%)	0.4	-10.0	-18.7

Source: NPCC Reliability Assessment for Summer 2023

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Winter Consideration

- NPCC's most recent winter assessment (2022-2023) shows low margins in New England and Quebec, beyond the 50/50 forecast level
  - Fuel deliverability risk for gas generators is one of the factors impacting New England's winter margin
    - MMU analysis on the gas availability shows that pipeline limits to New England impact the availability of gas generation in eastern NY under moderately cold winter weather
  - Quebec is a winter peaking system and typically requires external support during winter season.
    - All time peak demand record in Quebec has been set two years in a row (40,500 MW in 2022 and 42,700 MW in 2023)

- PJM announced significant shift in reliability risk to the winter based on preliminary analysis with updated reliability risk modeling (*5/30 Stakeholder Presentation*)

- IESO's 2022 Annual Planning Outlook shows switching to winter peaking system in early 2030s, and can be further advanced with significant electrification uptake in the industrial sector (*2022 Annual Planning Outlook*)
  - Summer peaking was forecasted to continue beyond 2040 in the 2021 Planning Outlook
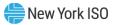
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Advancing EA Consideration

- **As part of the scope for this Whitepaper, the appropriateness for advancing EA prior to EOPs in the IRM model needs to be reviewed**
  - At this point, the NYISO aims to develop a more conservative EA modeling. Advancing EA prior to EOPs will offset some level of conservatism in the revised EA modeling
  - Advancing EA prior to EOPs can improve the current ELR functionality. However, the effect of advancing EA will need to be reviewed with the potential revised modeling for SCRs
    - Preliminary analysis indicates sizable level of advanced EA will be needed to have meaningful impact on the ELR performance.

- **NYISO recommends not to consider advancing EA prior to EOPs in the IRM model under this whitepaper**
  - Additional review can resume when revised modeling for SCRs is recommended

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Next Steps

- The NYISO to present the review of historical extra reserve data and potential IRM implications at the 8/2 ICS meeting

- The NYISO to also discuss initial recommendations for the EOP whitepaper at the 8/2 meeting
  - The NYISO aims propose seasonal, area and LFU bin – specific recommendations
  - The NYISO also aims develop process to review and update the EA assumptions on a regular basis

- The NYISO aims to have the draft whitepaper report for ICS review at the 8/30 meeting

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Our Mission & Vision

Mission
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

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Questions?

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