



NYISO Resource Adequacy Model *Draft Strategic Plan*

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ICS Meeting #268

November 2, 2022

Resource Adequacy Model Overview

- **Currently, the Resource Adequacy (“RA”) model supports three cyclical studies and fulfills additional tariff and compliance obligations**
 - IRM Study, for the New York State Reliability Council (NYSRC)
 - LCR Study, pursuant to ISO Tariff
 - ICAP Import Rights Study, pursuant to ISO Tariff
 - Support the Buyer-Side Mitigation assessments
 - Several annual reports to certify compliance with NYSRC Reliability Rules
- **The RA model also supports the NYISO ICAP Market evolution, and particularly starting 2023, the RA study model will serve as the base for NYISO’s Capacity Accreditation process**
 - Capacity Accreditation process will be based off the IRM/LCR study model and calculate Capacity Accreditation Factors to facilitate resources’ participation in the NYISO ICAP Markets
- **In addition, the RA model is used for planning studies such as the Reliability Needs Assessment (“RNA”) and Short-Term Assessment of Reliability (“STAR”) and the NYISO seeks to align major modeling approaches, techniques and assumptions between these studies and the IRM Study**

The RA Modeling Improvement Plan

- **Improvements to the RA model have been implemented through the NYSRC whitepapers, followed by sensitivity studies before final adoption in the IRM database**
 - Whitepapers are prioritized every year with the ICS
 - The prioritization considers the importance of the modeling improvements and the expected impact on the IRM, as well as resources available for research and model testing
- **With the progress of Capacity Accreditation, improvements to the Capacity Accreditation process, as well as the RA model, are also being considered**
- **A broader, and longer-term strategic plan for RA modeling improvements is needed to ensure the efforts are focused on important topics and resources are properly allocated**
- **The NYISO aims to develop a draft 5-year strategic plan with the modeling priorities aligned with the NYSRC**
 - Initial prioritization was conducted and the NYISO proposes five modeling themes as strategic priorities for the next 5 years

The Proposed RA Model Improvements & Strategic Priorities

Modeling Themes	2022	2023	2024	2025	2026
1. LCR Optimizer/Tan45 Methodology		LCR/TSL Improvement			
			Tan45 Methodology (pending estimated impact from BTM Solar treatment)		
				Comprehensive LCR/Tan45 Review	
					Stability of IRM/LCR
2. Winter Reliability and Modeling	Winter Modeling Initial Assessment	Winter Modeling Fuel Limitation Modeling			
			Tie and Seasonal Specific Emergency Assistance		
				Seasonal Specific Load And Topology	
					Winter Reliability & Outage Correlation
3. Energy Limited Modeling (ESR, SCR, DER, and ELR etc.)	ELR Model Adoption	EOP Structure Review (sequence of SCR/EA)			
			Modeling of DER		
				Continuous Improvement to the ELR Modeling	
4. Load Modeling	New Load Shape				
		New Load Shape + Updated LFU			
				Seasonal Specific Load Modeling	
5. Extreme Weather	Incorporate modeling improvements pending on progress and outcome from Extreme Weather working group				

LEGEND:

- NYISO Proposed Prioritized Modeling Improvements
- Expected Implementation Phase for IRM and Capacity Accreditation Process
- Extended Implementation Phase for IRM and Capacity Accreditation Process
- Specific model improvements are to be determined



Recommended Near-Term Project Plan (2023-2024)

- **Based on the proposed strategic plan on RA modeling improvements, the NYISO recommends the following projects for consideration in 2023 and 2024**
- **Recommended 2023 projects and initial whitepaper scope**
 - Winter Gas Modeling: determine gas constraints during winter and recommend the modeling approach for IRM
 - Emergency Operating Procedure (“EOP”) Sequence Review: review the source of Emergency Assistance (“EA”) and recommend alternative sequencing of EA as well as associated adjustments to SCR modeling
 - Testing and implementing LFU Phase 3 whitepaper recommendations
- **Expected 2024 projects and initial whitepaper scope; to be confirmed with ICS at the end of 2023**
 - Comprehensive Tan45 Methodology Review: Review the shifting methodology during the Tan45 process and recommend alternative methodology for shifting MW (e.g. Improved LCR Optimizer)
 - Tie and Seasonal Specific Emergency Assistance: review and recommend alternative EA modeling from individual inertias for both summer and winter seasons
 - Modeling of DERs: develop modeling approach for DERs
- **Other initiatives to be considered in the near term**
 - Improving the LCR Optimizer – Recommended NYISO project in 2023
 - Review treatment of BTM solar in conjunction with the new load shapes and updated LFUs – if resources available
 - Review calendar year vs. capability year modeling – if resources available

Next Step

- **If ICS accepts the recommendations, presents the RA modeling improvement strategic plan and the near-term project plan to Executive Committee for support**
- **Work with ICS to prioritize 2023 whitepapers and finalize the detailed scopes and timelines for the whitepapers**
 - The prioritization would consider the approved RA modeling improvement strategic plan and near-term projects
 - Additional whitepapers on topics other than RA modeling improvements, i.e. Review of Policy 5, will be considered and prioritized by the NYSRC and its consultants
- **On-going review and refine the RA Modeling Improvement Strategic Plan**
 - Allow modifications to the staging of the modeling improvements and new strategic priorities to be added based on system changes and updated policy directions (e.g. extreme weather modeling)

Appendix

- Detailed Description of RA Modeling Priorities

2022 RA Model - in flight / completed

- **Modeling changes expected in the base case:**
 - Withholding 350 MW Operating Reserve at the time of load shedding
 - Adopt GE ELR functionality for modeling existing elected Energy Limited Resources
- **Determine the impact of adopting new load shapes**
 - New load shapes are in the sensitivity case; pending NYSRC EC direction may be included in base case modeling
- **Modeling for ESRs based on the learnings from the high renewable study**
 - Initial modeling for small scale of ESRs can be accommodated with current modeling capability
 - Future improvement is required for large scale of ESR penetration beyond the initial entry
- **Assess the impact of implementing winter specific assumptions in the IRM model**
 - To inform the future prioritization of winter reliability modeling
- **Other improvement being considered include establishing process for regular topology updates for the IRM**

Modeling Priorities for 2023

- **Theme 1: Improvement to the LCR optimizer tool**
 - Consider inputs from MMU to ensure intuitive LCR outcome and stability of model results
- **Theme 2: Winter Reliability Modeling**
 - Fuel limited modeling with the focus on gas constraints during winter season
- **Theme 3: Investigate and improve the sequence within EOP steps, particularly Emergency Assistance and SCRs**
 - Improvement in this area will have an impact on the ELR modeling and set up for winter reliability modeling improvement for 2024
- **Theme 4: Adopt the new load shapes and improve LFU scaling in the IRM study**
 - LFU modeling improvement (LFU Phase 3 Whitepaper)
 - New load shapes combining with improved scaling from the LFU phase whitepaper
- **Additional items may be desired:**
 - (by RA team) Testing of the impact of BTM solar to inform prioritization for 2024 Tan45/LCR/TSL improvement
 - (by NYSRC) **Theme 5** - Extreme weather event modeling, improve ESR modeling and offshore wind impact
 - (by NYISO) Peak Load Window study and ESR Capacity Value study

Modeling Priorities for 2024

- **Theme 1: Comprehensive review of the IRM setting process, particularly the Tan45 methodology**
 - The current Tan45 methodology will require improvement in shifting capacity between upstate and downstate
 - The improved LCR optimizer may offer an alternative methodology to the Tan45 process
 - Pending on estimated impact, incorporate the BTM solar methodology in the comprehensive Tan45/LCR review
- **Theme 2: Winter Reliability Modeling**
 - Improve the modeling for emergency assistance from individual inertia and seasonal assumptions (summer and winter)
 - Effort to improve and simplify the external area modeling may also be included
- **Theme 3: Modeling for emerging resources/participation modes, i.e. DER, CSR and Hybrid resources**
 - Improvement to the ELR model may be required
- **Additional Items that may be desired:**
 - (by RA team) Investigate impacts on LCRs post peaker retirement
 - (by NYSRC) **Theme 5** - Extreme weather event modeling, improve ESR modeling
 - (by NYISO) Support the Capacity Demand Curve reset process

Potential Focus for 2025-2026

- **Theme 1: Continue the enhancement of Tan45 and LCR processes**
 - Shifting methodology in Tan45 process may start to fail after significant resource and topology changes between upstate and downstate
 - Impact from changes to southeast reliability due to combination of peaker retirement and offshore wind entry
 - Methodology review between the Tan45 and the LCR optimizer, with the potential of optimizing the IRM
 - Ensure the stability of IRM and LCR outcomes amid significant system changes and modeling enhancements
- **Theme 2: Continue to refine assumptions during winter season and assess the reliability during winter**
 - Winter assumptions include incorporating winter peak in load modeling (Theme 4) , seasonal topology limits, as well as weather correlated outages
- **Theme 3: Continue the modeling improvement for energy limited resources, particularly the modeling for DER, SCR and large penetration of ESRs**
- **Additional Items that may be desired by the NYSRC includes**
 - Theme 5 - Extreme weather event modeling and additional reliability standards

Capacity Accreditation (5-year plan)

- **The Capacity Accreditation is expected to involve continuous model improvement and implementation for the next 5 years. The anticipated work scope includes:**
 - 2023
 - Implementation of Capacity Accreditation process and software
 - Research on Gas Constraints, Start up time, and SCR modeling
 - 2024
 - Implementation of Gas Constraints, Start up time, and SCR modeling
 - Research on Winter Reliability issues
 - 2025
 - Implementation of Winter Reliability Issues
 - Research on Correlated outages and unit size
 - 2026
 - Implementation of Correlated outages and unit size
 - Research on alignment of load and resource output profiles

Potential Modeling Improvements

Attracting Stakeholder attention

- Review of intermittent resource modeling techniques, potentially supplementing the 5 years of historical data currently used in Resource Adequacy models
- Review of cable and generator forced outage data, potentially supplementing the 5 years of historical data currently used in Resource Adequacy models
- Use of forecasting tools for intermittent resource output
- Review of the reliability implications of maintenance scheduling given that other control areas have begun to experience tight operating conditions during maintenance seasons due to rapidly fluctuating intermittent resource output
- Process changes necessary to accommodate a winter peaking system
- Review high renewable impact with external areas with high renewable penetration
- Dynamic modeling of winter gas availability for thermal units
- Replacing the Resource Adequacy software platform with a different software platform
- Review the LCR Optimization method and enhance as necessary
- Expand software to consider additional localities or changes to the current zonal modeling
- Modeling separate summer and winter EFORd values
- Modeling of internal controllable line
- Calendar Year vs. Capability Year modeling
- Reviewing the NYSRC “parametric study” process and identifying enhancements

Questions?

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