New York ISO
Independent System Operator

# Tan45 Methodology Review Whitepaper Scope

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## ICS Meeting #286

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Revision: Scope edited per feedback from the 1/30/2024 ICS discussions

# Agenda

- Background
- Tan45 Methodology Review
- Interim Solution Research

# Background



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# Background

- The New York Control Area (NYCA) Installed Reserve Margin (IRM) study is conducted annually by the New York State Reliability Council (NYSRC) to determine the technical IRM for each Capability Year
- The current process to determine the technical IRM utilizes the Tan45 methodology
  - The Tan45 methodology is described in more detail in NYSRC Policy No. 5-17:
    https://www.nysrc.org/wp-content/uploads/2023/12/NYSRC-Policy-5-17_Final-5_12_23-w_erratta.pdf
- The NYSRC and stakeholders supported the NYISO conducting a review of the Tan45 methodology
  - The review of the methodology and consideration of potential alternative solutions and/or changes to the current methodology will be conducted over the next two years. The focus for the 2024 phase is the assessment of the Tan45 process in the context of a system experiencing significant changes
  - An interim solution may be needed in 2024 to address/account for the application of transmission security limit (TSL) floor values as part of the NYISO's Locational Minimum Installed Capacity Requirement (LCR) determination process and the impacts thereof on the current Tan45 methodology
- The Tan45 methodology review is part of the 5-year strategic plan for Resource Adequacy (RA) modeling improvements
  - NYISO Resource Adequacy Model Strategic Plan (2024-2028):
    https://www.nysrc.org/wp-content/uploads/2023/08/RA-Modeling-Improvement-Strategic-Plan-2024_v7_clean21459.pdf

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# 1/30/2024 ICS Discussion on TSL Floor Values

- During 1/30/2024 meeting, ICS discussed three areas of concerns related to TSL floor values used in the NYISO's LCR determination process
  - The transmission security analysis methodology utilized by NYISO's planning studies and applied to the calculation of TSL floor values
    - Discussion of any potential need for modifications to the transmission security planning methodology and/or the NYISO's LCR study methodology are not included within the scope of this whitepaper
      - Such discussions should occur within the NYISO stakeholder process
  - The intended scope of the Tan45 methodology review
    - The scope of this whitepaper is intended to assess the methodology to establish the IRM, including whether and how to consider/account for TSL floor values be considered that are part of the NYISO's existing LCR study methodology
  - The intended scope of the near-term/interim process assessment
    - The whitepaper also includes a near-term scope to assess potential process improvements for the 2025-2026 IRM study cycle as it relates to consideration of TSL floor values as part of establishing the IRM
    - The near-term scope is intended to seek opportunities to improve the process for the 2025-2026 IRM study considering the experiences from the 2024-2025 IRM study

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# Tan45 Methodology Review

*- 2024 Phase*



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# Tan45 Review – 2024 Phase

- The New York electricity grid is expected to experience significant changes over the coming years in the follow areas:
  - Changes to the transmission system infrastructure/topology
  - Changes in supply mix with increased penetration of renewable and other clean energy resources, including significant additions of offshore wind connecting to Load Zones J and K
- The NYISO plans to conduct the Tan45 process on a future system that is intended to reflect portions of these anticipated changes based on currently available information and assess the operation of the current methodology on a grid in transition
  - Many resources will be utilized to evaluate potential future system scenarios that could be studied (e.g., 2021-2040 System & Resource Outlook, 2022 Reliability Needs Assessment (RNA), NYISO Power Trends reports, etc.)
- Test cases would be developed based on the 2024–2025 IRM Final Base Case (FBC) technical study results (i.e., 23.1% IRM), with the following changes implemented:
  - Transmission system changes (e.g., Champlain Hudson Power Express (CHPE), Northern New York Priority Transmission Project, LI Public Policy Transmission Need (PPTN) upgrades, etc.)
  - Supply mix changes – renewable assumptions as tested in prior "high renewable" whitepapers/analysis
    - The focus of supply mix changes is on the increased penetration of offshore wind
    - Increased penetration of Energy Storage Resources (ESR) will not be considered due to potential modeling enhancements that are expected to be evaluated to improve the Energy Limited Resource (ELR) functionality in the longer term (link to 8/2/2023 ICS presentation: https://www.nysrc.org/wp-content/uploads/2023/08/ELR_ICS_Presentation_Updated0801.pdf)
    - The assessment of future supply mix changes could serve to address/replace the Phase 4 High Renewables White Paper planned by the ICS (link to ICS Action Items List: https://www.nysrc.org/wp-content/uploads/2024/01/Action-Item-List-Mtg-28627147.pdf)
  - Combination of both transmission system changes and supply mix changes

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# Tan45 Review – 2024 Phase Scope

- By conducting the Tan45 process on the test cases, the NYISO aims to answer the following questions:
  - Can the Tan 45 methodology successfully establish the IRM on these test cases?
    - How do the Tan45 curves change among these test cases as more system changes are being reflected?
    - If the Tan45 methodology successfully establishes the IRM, is there any potential risk that it may still fail?
    - If the Tan45 methodology fails to establish the IRM, what are the contributing factors?
  - If the Tan45 methodology fails with these test cases, are there any obvious improvements that can remedy the situation?
  - If alternative methodologies need to be considered, what are the guiding principles from the current Tan45 methodology that need to be maintained in alternative solutions?
    - Based on the interim solution research occurring in the near-term for this whitepaper, do TSL floors values need to be considered when evaluating guiding principles for alternative solutions?
- Next Step:
  - Subject to NYSRC approval of the scope, the NYISO will work with the ICS to finalize the assumptions for the test cases and proceed with database development

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# Proposed Timeline for 2024 Phase

| Milestone | Timeline |
|---|---|
| Present draft scope to the ICS for approval | 01/30/2024 |
| Finalize assumptions for test cases | February/March 2024 |
| Development of test cases | April 2024 |
| Conduct Tan45 process and present results and insights | July 2024 |
| Explore methodology improvements and identify guiding principles | Q3 – Q4 2024 |
| Develop draft scope for 2025 Phase | December 2024 |

- As this project proceeds, the NYISO will provide ongoing updates to the ICS to share progress and solicit feedback

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# Interim Process Development

*- Consideration of TSL Floor Values*



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# Interim Process Development Scope

- During the 2024–2025 IRM study, material differences arose between the locational capacity requirements resulting from the Tan45 methodology and the TSL floor values applicable for the NYISO's LCR study. This resulted in a system that is better than criterion when combining IRM from Tan45 process and the TSL floor values.
  - Similar conditions could also arise in the 2025–2026 IRM study
- The objective of this component of the scope is to identify and assess potential process improvement for the consideration of TSL floor values as part of the 2025–2026 IRM study cycle
  - Prior analyses (2021 analysis, 2023 analysis) were conducted to incorporate TSL floor values in the current Tan45 methodology. These analyses, and additional considerations (e.g., implementing TSL floor values on the Tan45 curves or using the NYISO's LCR optimizer), can inform the assessment of the potential near-term process improvements
  - Additional, improvements that aim to timely collect necessary inputs to provide information regarding the potential implications of the TSL floor values on the IRM will also be considered with a desire to inform the ICS prior to finalizing the Tan45 results
    - Sensitivity case for the 2025-2026 IRM Preliminary Base Case can also be considered
- Next Step:
  - Subject to NYSRC approval of the scope, the NYISO will work with the ICS to solicit inputs on provisional technical study processes of considering TSL floor values with current Tan45 methodology

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# Proposed Timeline for Interim Solution Research

| Milestone | Timeline |
|---|---|
| Present draft scope to the ICS for approval | 01/30/2024 |
| Solicit inputs for potential technical study process improvements | February/March 2024 |
| Assessment of potential technical study process improvements | April/May 2024 |
| Develop recommendations for process improvements to implement for the 2025-2026 IRM study cycle | May/June 2024 |
| Subject to NYSRC's approval, implement recommended process improvements in the 2025–2026 IRM study cycle | June/July 2024 (implementation pending NYSRC's approval) |

- As this project proceeds, the NYISO will provide ongoing updates to the ICS to share progress and solicit feedback

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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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