Interregional Study Update: Increasing New England Loss of Source Limit

December 2025 IPSAC Update

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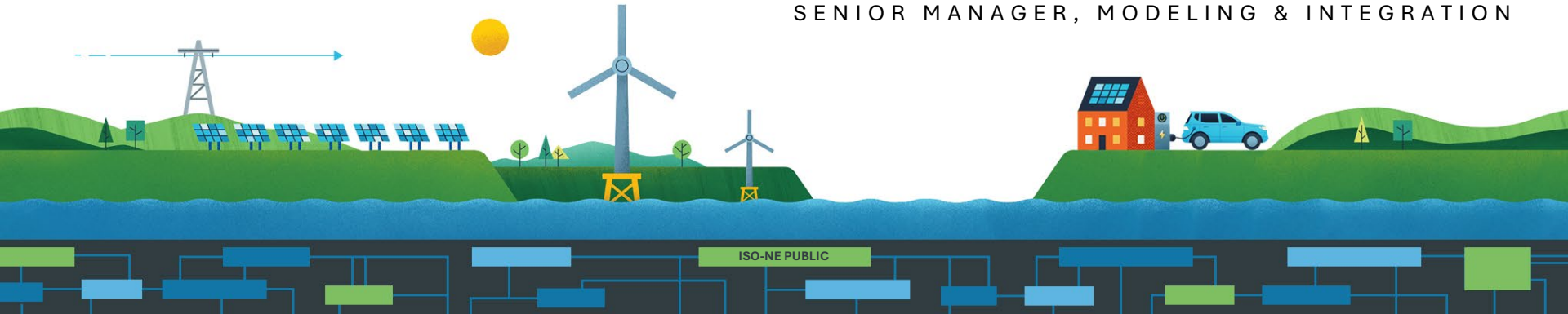

Purpose

- Provide an update on the ongoing joint study between ISO New England (ISO-NE), New York ISO (NYISO) and PJM to evaluate raising the New England loss of source limit
  - Review key conclusions from the transfer analysis and steady-state analysis done to-date
  - Discuss decision to pause the analysis work and potential next steps

Background

- Today, in planning studies New England must respect a 1,200 MW loss of source limit to recognize potential historically-identified reliability issues in both PJM and NYISO's areas
  - This 1,200 MW limit has the potential to constrain system design in New England, especially in the context of offshore wind (OSW) resources
- On March 27, 2023, ISO-NE sent a request for an interregional study to JIPC
- ISO-NE requested:
  - Evaluation of the loss of source limit in today's system to see if the limit can be raised above 1,200 MW
  - If the limit on today's system remains below 2,000 MW, identification of upgrades necessary to support a 2,000 MW loss of source limit
- On August 23, 2023, the JIPC agreed to participate in the study
- In April 2024, ISO-NE selected a consultant to perform the loss of source study
- ISO-NE, NYISO, and PJM received a letter from multiple states requesting the interregional study be completed by September 2024
  - A response was provided, stating that September was not achievable
- An update was provided to IPSAC on December 6, 2024 and May 2, 2025 on the study efforts

High-level Scope of Study

- The study is divided into two stages:
  - Stage 1 - Identify the maximum level of source loss in New England that leads to reliability concerns in the PJM or NYISO system for the planned system conditions
    - A parallel effort is necessary to understand the appropriate governing documents that would need to be updated to codify any increase in the maximum loss of source in New England
  - Stage 2 – If the maximum level of source loss in New England is less than 2,000 MW, determine the transmission upgrades necessary to raise the loss of source limit to 2,000 MW (Future Work)

Background: Study Status as-of May 2025

- Stage 1 of the study was divided into 4 steps

- As of the May IPSAC meeting
  - Steady-state transfer analysis was mostly complete with analysis of one interface (New York –New England) pending
  - Preliminary results from the N-1 steady-state analysis were discussed

Highlights from May 2025 IPSAC Meeting

- Transfer analysis of key interfaces in PJM and NYISO area indicated that except for the Central East interface, the other key interfaces were not limited by a 2,000 MW loss of source contingency in New England
  - The preliminary results indicated that a loss of source in New England up to 1,800 MW would not limit transfers on the Central East interface
  - New York-New England (NY-NE) transfer analysis was being performed
- Preliminary steady-state analysis indicated that some thermal/voltage violations were observed in the New England system in the vicinity of the NY-NE tie lines for a 2,000 MW loss of source contingency that may constrain the loss of source in New England to 1,200 MW
- Several challenges with raising the loss of source limit that are beyond the scope of the current joint study were discussed
  - Operational/implementation challenges, reliability risks and potential costs

Results of Central East Transfer Analysis

- Voltage transfer analysis indicated that a loss of source up to 1,900 MW does not limit transfers on the Central East interface
  - This was a slight increase from the preliminary numbers discussed at the May IPSAC meeting
- Thermal transfer analysis indicated that a loss of source up to 2,000 MW does not limit transfers on the Central East interface
- For the instances where a 2,000 MW loss of source in New England was limiting Central East transfers, the constraint was close to the NY-NE interface

Results of NY-NE Transfer Analysis

- N-1 and N-1-1 thermal analysis was performed
- A 2,000 MW loss of source contingency in New England was found to limit N-1 and N-1-1 thermal transfer capability on the NY-NE interface
- Results indicate that any increase in the largest loss of source in New England over 1,200 MW would result, for certain planning scenarios, in an adverse impact on NY-NE transfer capability

Key Takeaway from Transfer Analysis

- For the planned system, constraints along the NY-NE interface will be a limiting condition on the ability to increase the loss of source limit in New England
  - Any increase in the loss of source limit in New England will require reinforcements to NY-NE
- Further, to increase the loss of source limit in New England to 2,000 MW reinforcements would also appear to be required to the Central East interface in New York

N-1 Steady-State Analysis

- Summer and winter peak load base cases were setup with the following key interfaces simultaneously stressed:
  - NY-NE
  - Central East
  - PJM-NY
  - PJM Western
- Since the cases are for a 10 year out system, there are unresolved local issues in the base cases
  - Analysis was focused on trying to identify violations that were made worse by a loss of source contingency in New England
  - The testing included varying sizes of loss of source contingencies in New England from 1,200 MW to 2,000 MW to help identify the level of loss of source that would make a violation worse

Results from N-1 Steady-state Analysis

- Summer Peak Case:
  - All constraints (thermal and voltage) that were made worse by a 2000 MW loss of source in New England were along the NY-NE interface. All sources in New England need to be at 1,200 MW or lower to avoid making violations worse.

- Winter Peak Case:
  - NY-NE constraints (thermal and voltage) continue to limit the increase in loss of source in New England with constraints along the NY-NE interface. All sources in New England need to be at 1,600 MW or lower to avoid making violations worse.
  - Additionally, PJM-NY voltage constraints begin to show up in the winter peak cases. All sources in New England need to be at 1,600 MW or lower to avoid making violations worse.

Observations on Steady-state Analysis

- The voltage issues seen along the PJM-NY interface and NY-NE interface were not observed in the transfer analyses because only thermal transfer capability was evaluated for these interfaces
- The base cases represents a N+10 system where there are a significant number of pre-existing thermal and voltage violations, especially in the winter peak cases
  - Higher system loads and additionally the inclusion of some large loads in the NY system seem to be the driver of these pre-existing issues
  - To accurately evaluate the ability to raise the loss of source limit in New England, the plans to resolve some of these pre-existing issues will need to be known

Key Insights from Study To-date

- With the work done so far, the following conclusions can be reached:
  - The loss of source limit in New England will remain 1,200 MW for the planned system due to constraints along the New York – New England system
- To raise the loss of source limit to 2,000 MW in addition to upgrades along the New York – New England interface, additional transmission reinforcements may be needed at a minimum on the Central East interface and perhaps on the PJM-NY interface as well

Changes in NYISO System

- NYISO has identified that there are potential major changes in the vicinity of the Central East interface
  - Large load development and associated upgrades could have a significant impact on the study findings
  - The 2025-2034 Comprehensive Reliability Plan also discusses different voltage performance issues experienced in operations
- Solutions to these issues would need to be assessed before a clear impact of increasing the loss of source in New England and potential upgrades can be understood

Unstudied Impacts on New England Interfaces

- The observation of adverse impacts on the New York-New England interface raises the question of how internal interfaces in New England will be impacted by a larger loss of source limit in New England
  - Examples of interfaces to evaluate include West-East, SEMA/RI import, etc.
- From a New England perspective, there is more to be explored than originally scoped to evaluate increasing the loss of source limit in New England
  - This will include thinking about possible locations for 2,000 MW resources and limitations on maximum number of such resources

System Reserves

- If the system (in PJM, NYISO or ISO-NE areas) were to enter a multi-element outage state where the loss of source of 2,000 MW may not be achievable, the 2,000 MW sources in New England may need to be backed down to be prepared for subsequent contingencies
  - The reserves and their required location, to allow such a backdown, will depend on the number of resources that are online at 2,000 MW as well as the reduced loss of source limit
- This is another reason to consider expectations around the maximum number of single resources over 1,200 that would interconnect

Need for Clarity on Agreements between Areas

- A key aspect to implementing any increase in the loss of source limit is understanding how the increase would be codified (how such capability would be preserved on neighboring systems) and how conditions where resource curtailment in New England are identified and coordinated
- Before additional analysis on increasing the loss of source limit is performed, establishing the framework of how such an increase would be implemented would be needed

Study Status

- Given the complexity of the study as well as the need to coordinate between the three RTOs, the analysis done by the consultant has exceeded the amount budgeted by ISO-NE
- As of Q3 2025, ISO-NE suspended work on this project with the following analysis that was a part of the original scope not being completed:
  - N-1-1 steady-state analysis
  - Stability analysis
  - Determine the transmission upgrades necessary to raise the loss of source limit to 2,000 MW

Summary of Concerns

- ISO-NE has identified the following items that need to be addressed prior to additional analysis being performed
  - Ensure that the NYISO system has addressed the changes around the Central East interface so that impacts of the loss of source in New England can be accurately studied
  - Ensure that the pre-existing voltage issues seen around the PJM-NY interface are addressed so that the impact of loss of source in New England can be assessed accurately
  - Identify location and total number of 2,000 MW resources that New England would want to interconnect
  - Gain clarity on how any increase in loss of source limit will be codified and what conditions may require resources in New England to be curtailed back to 1,200 MW
  - Identify impact of the above two items on reserve requirements

Next Steps

- Given the list of issues that would need to be addressed prior to performing any additional analysis, and other competing priorities for the three RTOs, ISO-NE will be concluding the loss of source study with the analysis done to date
  - While the study was unable to achieve its objectives, the analysis performed has established a new baseline for system constraints in PJM and NYISO areas that are impacted by a loss of source in New England
  - The efforts of this joint study will allow the RTOs to start from a better position if the three RTOs explore increasing the loss of source limit in the future

Questions