



Follow-up Discussion:

Maintaining Operating Reserves During Load Shedding Events

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Background

- During the Feb. 2 ICS meeting, the proposed modeling enhancement of maintaining operating reserves (OR) at load shedding events was discussed ([here](#)). The ICS raised the following questions:
 - How is the operating reserve level managed during real time operations?
 - What are the applicable reliability rules that impact the operating reserve assumptions in the IRM study?
 - How does the experience in other jurisdictions apply to the NYCA system?

Agenda

- **Today's presentation aims to address the ICS questions in the following manner:**
 - Applicable reliability rules and standards on Operating Reserve across the US
 - Operating Reserve during an emergency situation in real time operations
 - The applicability of real time operations in the IRM assumptions

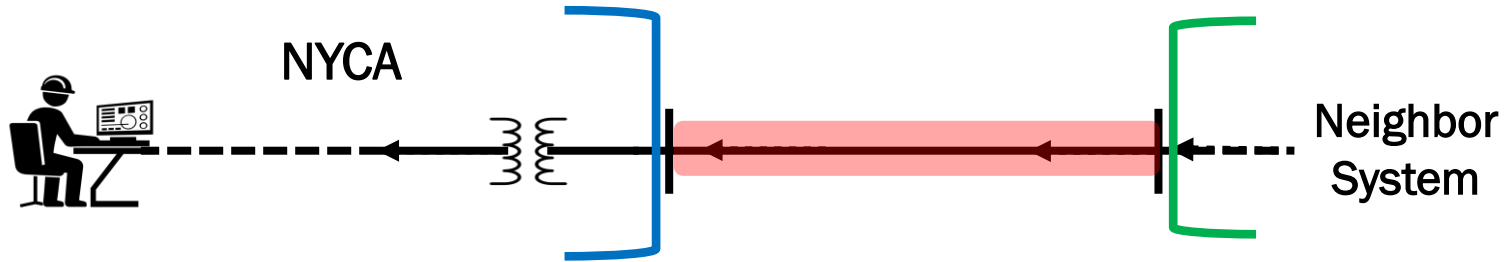
Reliability Rules on Operating Reserves

- **Reliability Rules apply to Eastern Interconnection**
 - NERC Standard BAL-001-2 and BAL-002-2 require balancing control for interconnection frequency and post contingency disturbances
 - NPCC Directory 5 has a specific requirement on 10-minute reserves
 - NYSRC Reliability Rules E.1 also specify the requirement on 10-minute reserves that is consistent with both NERC and NPCC standard ISONE maintains a minimum $\frac{1}{2}$ of 10-minute reserves in the capacity requirement assessment
- **Operating Reserve standard in WECC**
 - Specifically for WECC, NERC also requires the minimum Contingency Reserve to be maintained on top of the Operating Reserve, in the amount of the greater of the most severe contingency or the sum of 3% hourly integrated load and generation (BAL-002-WECC-3)
- **Emergency Procedure involving Operating Reserves in ERCOT**
 - Due to lack of frequency support via inerties, ERCOT will initiate controlled outages when operating reserves drop below 1,000 MW (Energy Emergency Alert Level 3)

Operating Reserves in Real Time Operations

- From the IRM perspective, operating reserves are considered as the last emergency procedure before initiating load shedding
- However, during real time operations, grid operators need to manage the electricity grid and follow multiple reliability rules and operating standards
 - In addition to the reliability rules specifically on Operating Reserves, operators also need to follow rules and standards to manage loadings on the transmission system and the interties (e.g., NERC TOP-001-5 & IRO-009-2, NPCC Directory 1 & 2, NYSRC Rules E.1)
- The combined impact of multiple reliability rules and operating standards in practice require the operator to maintain a certain level of Operating Reserves to manage volatility on the system, even during the time of emergency

Illustrative Example of Emergency Operations



- For example, during an emergency, the operator is facing the following system conditions:
 - Remaining Operating Reserve = 100 MW
 - The intertie (shaded red) is loading at Short-Term Emergency (STE) rating for loss of a parallel line
 - All other Emergency Operating Procedures have been implemented
- To manage the loading on the intertie at or below the STE limit, and to prepare for additional volatility on the system, operator would initiate load shedding at 100 MW to create addition reserve on the generation and to manage the tie line loading during normal system volatility.

Operating Reserve Assumptions in the IRM

- **The current Operating Reserve modeling in the IRM assumes all the operating actions are exhausted prior to loss of load event. This assumption does not capture:**
 - The operating reality when load shedding is needed.
 - The action of maintaining Operating Reserves during real time operation
- **It is prudent to review the IRM assumption and consider maintaining some level of Operating Reserves in the model**
 - In 2021, ISONE implemented maintaining 700 MW of minimum Operating Reserves in the Installed Capacity Requirement assessment.
- **In addition, reflecting the operating reality that some level of Operating Reserve will need to be maintained at load shedding in the IRM study will set the appropriate requirement to provide sufficient capacity to meet the 0.1 LOLE Criterion.**

Next Steps

■ April

- Assess impacts on a prior IRM case
- Refine draft proposal

■ May

- Additional impact assessment
- Finalize proposal

■ June

- Review final proposal with ICS and EC
- Perform sensitivity analysis on IRM PBC

Questions?

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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