

2023 IRM Enhancement:

Maintaining operating reserves for tie line control during load shedding events



Background

- The IRM study uses probabilistic simulations to evaluate grid reliability, including compliance with resource adequacy criteria (MARS simulations).
- Wide ranging data and assumptions feed into the simulations, including generation, load, transmission, and emergency operating procedures.
- MARS simulations should mimic actual grid operations to the extent possible, including representing the expected operating actions up to and including load shedding.
- In light of recent resource adequacy challenges experienced in other areas, the NYISO has reviewed the how load shedding is represented in MARS simulations.



Background, cont'd

- Other ISO/RTO grid operators represent the operational need to retain a minimum level of operating reserves to provide for sufficient tie line loading control during load shedding events.
 - Variability in system load, generator output, weather dependent resource output, and system frequency all contribute to Area Control Error (ACE) and the need for tie line loading control.
 - Operating reserves can be converted to energy to control a NERC Balancing Area's Area Control Error (ACE) and provide for tie line loading control during load shedding events.
- If a Balancing Area's tie line loadings cannot be controlled in actual operations during a load shedding event, then that Balancing Area is prone to system collapse of its entire system
 - A system collapse may result from the cascading loss of its tie lines to neighboring regions that are providing it emergency assistance.
- The current IRM study process assumes that all levels of operating reserves can and will be fully depleted prior to the initiation of load shedding.



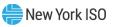
Background, cont'd

NERC Reliability Standards Involved

- BAL-001-2 Real Power Balancing Control Performance To control Interconnection frequency within defined limit
- BAL-002-2 Disturbance Control Standard Contingency Reserve for Recovery from a Balancing Contingency Event – Ensure the Balancing Authority balances resources and demand and returns the Control Error to defined values following a Contingency

NPCC Reserve Requirements Involved

- NPCC Directory 5 Reserve Operating capacity is required to meet forecast demand, including an allowance for error, to provide protection against equipment failure which has a reasonably high probability of occurrence, and to provide adequate regulation of frequency and tie line power flow. Each Balancing Authority shall have ten-minute reserves available to it that is at least equal to its first contingency loss, and must plan for and deploy adequate reserves
- NPCC Directory # 2 Emergency Operations Provides actions to address transmission or capacity emergencies – If a Balancing Authority can not maintain frequency regulation or tie line flow it may need to shed firm load



Background, cont'd

Minimum Operating Reserve Considerations – ISO-NE Example

- A Balancing Authority must always be able to regulate frequency and control tie-line loadings - even during load shedding events
 - ISO/RTO Balancing Areas utilize their 10-minute synchronized operating reserve and regulating (Automatic Generation Control, "AGC") reserves to meet these obligations
- ISO-NE utilizes 700 MW as its minimum operating reserve requirement when establishing their Installed Capacity Requirements.
 - This value reflects the total of ISO-NE's typical values of 10-minute synchronized operating reserve and regulating (AGC) reserve requirements.



Proposed Enhancement for 2023 IRM

- Maintain a minimum level of operating reserves during load shedding events for tie line loading control
 - Minimum level of operating reserves will be further discussed at ICS.
 - Location of reserves to be held will be evaluated at ICS.
 - The need for a periodic review of the minimum operating reserves will be evaluated at ICS.
- After developing the proposal with ICS, NYISO will perform a Tan45 analysis to determine whether IRM impacts are as expected.



Proposed Enhancement for 2023 IRM, cont'd

- NYSRC ICS is evaluating several enhancements as part of the 2023 IRM cycle
 - Maintaining operating reserves
 - Adopting the enhanced energy limited resource ("ELR") modeling functionality
 - Updating load shapes
- As proposals emerge, NYISO recommends assessing both individual and cumulative effects of these enhancements



Next Steps

March

Present draft proposal

April

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

May

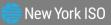
- Additional impact assessment
- Finalize proposal

June

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



Questions?



Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system



