



2023 IRM Enhancement:

Maintaining operating reserves for tie line control during load shedding events

ICS Meeting #257

February 2, 2022

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

