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Independent System Operator

Reliability and Market Considerations for a Grid in Transition: Operations Reliability Considerations

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Agenda

- Background
- A Grid in Transition: Reliability and Market Considerations
- Next Steps

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Background

Background

- The purpose of this presentation is to provide a response from NYISO Operations on the Reliability Gap Assessment in the Grid in Transition report
  - The report identified ten possible future reliability gaps assuming a high level of intermittent and/or limited energy supply resources
- On April 14, 2020, the NYISO presented the Market Design Improvements for the Reliability Gap Assessment
  - https://www.nyiso.com/documents/20142/11904936/Grid%20in%20Transition%20Discussion%20MIWG%2004142020.pdf/aa59f891-c7e4-76fe-1c43-30a2be9a9035
- As previously discussed, the NYISO will be giving a presentation on the in-depth analysis of the market design components of the Reliability Gap scheduled for June 22nd

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Reliability Considerations

Potential Reliability Concerns at High Levels of Intermittent Generation

- Maintain Ability to Balance Load and Generation
- Maintain 10-Minute Operating Reserves
- Maintain Total 30-Minute Operating Reserves
- Maintain Ability to Meet Daily Energy Requirements
- Maintain Reliable Transmission Operations
- Maintain Black Start Capability
- Maintain Voltage Support Capability
- Maintain Frequency Response Capability
- Maintain Resource Adequacy
- Ability to Manage Supply Resource Outage Schedules

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Maintain Ability to Balance Load and Generation

Potential Reliability Gap #1: The NYISO may be challenged to meet NERC control performance requirements while balancing high output levels of intermittent generation with system demand that may be difficult to forecast in real-time operations

NYISO Plan for Gap #1: The NYISO will continue to track applicable NERC Balancing Area Control Performance Standards and implement necessary operational and market changes in order to maintain acceptable control performance, which may include:

- Increasing statewide regulation procurement requirements
- Increasing statewide 10- and/or 30-minute operating reserve requirements
- Investigating the need for separate regulation "up" and "down" service
- Promoting more frequent interchange scheduling with neighboring regions
- Improving the NYISO's Real-Time Energy Market Dispatch
- Accounting for increased real-time load forecast uncertainty when establishing Day-Ahead and real-time resource schedules

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Maintain 10-Minute Operating Reserves

Potential Reliability Gap #2: The NYISO may be challenged to schedule sufficient 10-minute operating reserves and meet NERC disturbance control performance requirements in response to variations in the levels of output from intermittent generation

NYISO Plan for Gap #2: The NYISO will continue to track the resources capable of providing and offering 10-minute operating reserves and the applicable NERC Balancing Area Disturbance Control Standards. If necessary, the NYISO will develop and implement necessary operational and market changes in order to maintain acceptable control performance, which may include:

- Increasing statewide 10- and/or 30-minute reserve requirements
- Promoting more frequent interchange scheduling with neighboring regions
- Accounting for increased real-time load forecast uncertainty when establishing Day-Ahead and real-time resource schedules
- Evaluating the sustainability of 10-minute and 30-minute reserves

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Maintain 30-Minute Operating Reserves

Potential Reliability Gap #3: The NYISO may be challenged to meet the NPCC Operating Reserve Standards requirements to not be deficient of 30-minute operating reserve for greater than four hours in response to longer-term variations in the levels of output from intermittent generation

NYISO Plan for Gap 3: The NYISO will continue to track performance with respect to applicable NPCC Operating Reserve Standards; monitor Control Performance, reserve deficiencies, and the ability to re-establish reserves after a reserve shortage occurs. If necessary, the NYISO will develop necessary operational and market changes in order to maintain acceptable control performance, which may include:

- Increasing statewide 30-minute operating reserve requirements
- Promoting more frequent interchange scheduling with neighboring regions
- Accounting for increased real-time load forecast uncertainty when establishing Day-Ahead and real-time resource schedules
- Evaluating the sustainability requirements of 10-minute and 30-minute operating reserves

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Maintain Ability to Meet Daily Energy Requirements

Potential Reliability Gap #4: The NYISO may be challenged to meet NERC Balancing Area Control Performance Standards criteria when managing high output levels of intermittent resources and resources with limited energy to meet balancing energy requirements in real-time operations

NYISO Plan for Gap #4: The NYISO will continue to track performance with respect to applicable NERC Balancing Area Control Performance Standards and operating reserves criteria. If necessary, the NYISO will develop and implement necessary operational and market changes in order to maintain acceptable control performance, which may include:

- Developing new capability for operator management of limited energy supply resources
- Increasing statewide 10- and/or 30-minute operating reserves requirements
- Accounting for real-time load forecast and intermittent renewable uncertainty when establishing Day-Ahead and real-time resource schedules

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Transmission Operations & Congestion Management

Potential Reliability Gap #5: The NYISO may be challenged to meet NERC Transmission Operations requirements that may be difficult to forecast in real-time operations when operating under high levels of intermittent resource generation

NYISO Plan for Gap #5: The NYISO will continue to track performance with respect to applicable NERC, NPCC, and NYSRC Transmission Operations Standards. If necessary, the NYISO will develop and implement necessary operational and market changes in order to maintain acceptable performance, which may include:

- Increasing transmission facility constraint reliability margins
- Increasing locational 10-minute spin and total operating reserves requirements
- Increasing locational 30-minute operating reserves requirements
- Investigating the need for a locational (zonal) ramping product
- Accounting for increased real-time load forecast uncertainty when establishing Day-Ahead and real-time resource schedules
- Evaluating the sustainability requirements of 10 minute and 30 minute reserves

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Restoration and Black Start Capability

Potential Reliability Gap #6: The NYISO may be challenged to effectively restore the system following a blackout given a system with high penetration levels of intermittent generation resources

NYISO Plan for Gap #6: The NYISO will implement and monitor the effectiveness of established NERC and NYSRC Standards and procedures that require acceptable tools and processes for statewide and NYC restoration. NYISO will continue to review and test black start capability performance to ensure it can be maintained as system changes occur through time:

- Annual Review and Update of Restoration Plan
- Coordination of NYISO and Transmission Owner Restoration Plans
- Facilitate participation of resources in the Con Edison Restoration Plan

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Voltage Support

Potential Reliability Gap #7: The NYISO may be challenged to meet NERC, NPCC, and NYSRC voltage performance requirements for a power system with high penetration levels of intermittent resources

NYISO Plan for Gap #7: The NYISO will continue to study voltage performance in both the long-term planning and short-term operating timeframes. If necessary, the NYISO will develop and implement necessary operational and market changes in order to maintain acceptable control performance, which may include:

- Study voltage performance in the long-term planning timeframe (RNA)
- Study voltage performance in the short-term operating planning timeframe (Operating Studies/Limits)
- Investigate the potential for new resource types to supply reactive capability as new technologies seek participation in programs

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Frequency Response

Potential Reliability Gap #8: The NYISO may be challenged to meet NERC, NPCC, and NYSRC frequency performance requirements for a power system with high penetration levels of intermittent resources

NYISO Plan for Gap #8: The NYISO will continue to study frequency performance in both the long-term planning and short-term operating timeframes. If necessary, the NYISO will develop and implement necessary operational and market changes in order to maintain acceptable control performance, which may include:

- Study frequency performance in the long-term planning timeframe (RNA)
- Study frequency performance in the short-term planning timeframe (Operating Studies/Limits)
- Investigate the potential for new resource types to supply frequency response capability as new technologies seek participation in programs

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Maintain Resource Adequacy

Potential Reliability Gap #9: The NYISO may be challenged to maintain acceptable levels of resource adequacy

NYISO Plan for Gap #9: The NYISO will continue to monitor resource supply capability relative to targets (*e.g.,* total system reserve margin and IRM) for both the long-term planning and short-term operating timeframes. If necessary, the NYISO will develop and implement necessary operational and market changes, which may include:

- Monitor supply relative to LOLE in long-term planning timeframe (RNA)
- Monitor supply relative to IRM in shorter-term planning timeframe (Installed Capacity (ICAP) Market)
- Ensure generator operating characteristics are accurately modeled when evaluating resource adequacy and are appropriately accounted for in the ICAP market

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Ability to Manage Supply Resource Outage Schedules

Potential Reliability Gap #10: The NYISO may be challenged to manage supply resource maintenance outage scheduling

NYISO Plan for Gap #10: The NYISO will continue to monitor its procedures for supply resource outage scheduling to determine whether additional operational and/or market changes should be developed to help maintain operating capability targets throughout the year

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Next Steps

Next Steps

- The NYISO will be giving a presentation on the in-depth analysis of the market design components of the Reliability Gap scheduled for June 22nd

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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

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Questions?