

# New York – Vermont Interconnection Screening Analysis

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# Background

- Vermont 10-Year Needs Assessment in progress
  - Several problem areas identified in the system
  - Several conceptual solutions considered to address system issues
  - Has not been finalized at this point in time
- Major wind projects being studied in upstate New York
  - May need higher rated or additional export paths than are currently available.
  - Subject of ongoing NYISO and TO studies
- Load growth coupled with facilities (transmission and generation) normally out of service raises reliability issues in both New York and New England

# Background, *cont.*

- Voltage limitations restrict flow on Central East to 2,800 MW
  - Previous studies indicated an upgrade of the Plattsburgh – Vermont transfer capability would increase this limit
- Screening analysis of a new Plattsburgh – Vermont tie was completed and reviewed with IPSAC
  - Preliminary results showed benefits of
    - Improved performance of the Vermont and New York systems under the dispatch assumptions used
    - Higher loss of source limits
    - Greater ability to transfer power out of New York's North Country

# Scope of Work

- Assess currently planned system performance
- Evaluate two proposed alternative transmission improvements for interregional impacts and their effects on inter-regional reliability
- Look at effects of new path at multiple North Country levels of wind dispatch
- Conduct screening for potential impacts on NY Central East & PJM transfers across West, Central, East, and Juniata input interfaces for New England source loss contingencies
- Examine 2013 and 2018 systems

# Base Cases

- Base cases are as follows
  - As found system
  - As found system plus 230 kV tie from Plattsburgh to Granite, VT
  - As found system plus 230 kV tie from Plattsburgh to New Haven, VT
- Both new tie cases had two 350 MVA 230 kV/115 kV transformers at Essex, VT
- PAR & New Tie ratings assumed to be above 500 MVA
- New 350 MVA 230 kV/115 kV transformer added at Granite for new tie to Granite
- New 350 MVA 230 kV/345 kV transformer added at New Haven for new tie to New Haven

# Sensitivities

- Dispatch scenarios were as follows
  - Central East at 2,700 MW of transfer
  - New York new wind farms at 50 MW total output
  - New York new wind farms at 450 MW total output
  - New York new wind farms at 900 MW total output
- PV20 sensitivities
  - PV-20 scheduled at 105 MW to New England(base case)
  - PV20 scheduled at 0 MW (evaluated as sensitivity)
  - PV20 out of service (evaluated as sensitivity)

# Sensitivities, *cont.*

- Sensitivity cases with elements normally out of service
  - Granite 230 kV out of service
  - Highgate DC/DC converter out of service
  - Vermont Yankee out of service
  - Coolidge - West Rutland 345 kV out of service
  - Coolidge 345 kV/115 kV transformer out of service
  - Alcoa aluminum load out of service
  - Saranac Energy out of service

# Methodology

- All study work was fully coordinated
  - ISO-NE
  - NYISO
  - PJM
  - VELCO
  - United Illuminating
  - New York Power Authority
  - National Grid
- Base cases were developed jointly by ISO-NE, NYISO, and PJM with input by affected transmission owners in the area
- All criteria contingencies (loss of single elements, double circuit outages, stuck breaker faults, etc.) were jointly developed and reviewed

# Methodology, *cont.*

- Analysis run by ISO New England and NYISO
  - PJM and transmission owners kept advised on status
- Feedback solicited on results, and adjustments were made as needed
- A series of system dispatches were run for the 2013 base case
- A comparison of system performance (voltage and thermal) between the existing system and each tie option (Granite and New Haven) was conducted

# Description

- The optimal VT PAR settings and operational ranges for both tie options under each dispatch were identified
- Thermal overloads and voltage violations identified for each dispatch
- Voltage performance that improved and degraded with new transmission facilities is highlighted

# Non-CEI results

- The following were observed generally for the cases under study
  - Voltage performance in Vermont improves with addition of either new tie
  - For some scenarios, New York has a few post contingency voltage issues, but those are eliminated with the addition of a new tie
  - New tie would have a secure operational range of at least 200 MW to Vermont for most (but not all) cases
  - Tie provides needed support for elements normally out of service in either New England or New York

# Conclusions

- A new tie from Plattsburgh to Vermont improves overall system performance in both Vermont and New York under certain conditions
- A new tie to New Haven provides better system performance than a tie to Granite
- The following additional system improvements would increase the benefits of the new tie
  - Separate the Moses – Willis lines from common structures
  - Close the Plattsburgh 230 kV bus for the 230 kV tie options
  - Reactive improvements and circuit upgrades in Vermont as considered in the Vermont Long Range Plan
- Options other than a new tie should be considered by New York and New England
- Conduct production cost analysis that considers higher transfer capability between New York and New England

# Next steps

- By the December IPSAC meeting
  - Complete transmission analysis of the 2018 system
  - Complete production cost analysis that considers higher transfer capability between New York and New England
- Discuss CEII information with individual stakeholder committees in New York and New England
- Include results in the 2009 Northeast Coordinated System Plan



# Questions