

2020-2021 Reliability Planning Process: Post-RNA Base Case Updates – Dynamics

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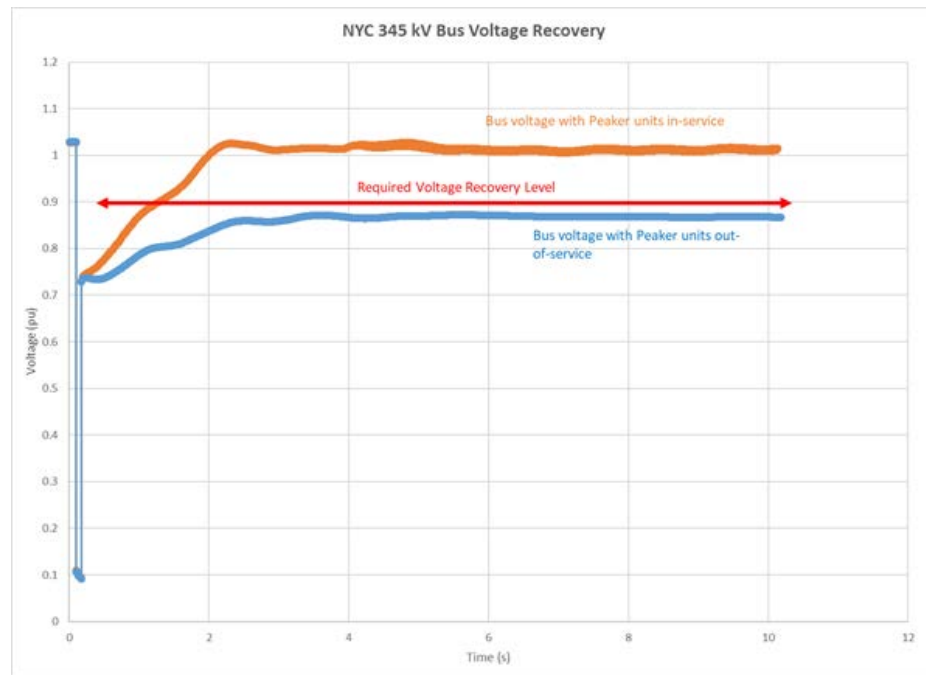
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Background

- The 2020 Reliability Needs Assessment (RNA) identified both resource adequacy and transmission security Reliability Needs starting as early as 2024. [\[link\]](#)
- The post-RNA Base Case updates were presented at the February 23, 2021 ESPWG/TPAS. [\[link\]](#)
- Resource adequacy and steady state transmission security Reliability Needs were eliminated following the updates.
- The NYISO has continued to analyze the observed transient voltage response violations to further understand the interaction of the non-bulk and bulk systems, and to determine if any Reliability Needs remain on the Bulk Power Transmission Facilities (BPTFs).

Transient Voltage Response Criteria

- Following a fault, most Transmission Owners' criteria require that a given bus must recover to 0.9 per unit voltage within 5 seconds after the fault has cleared (transient voltage response)
 - LIPA criterion is 0.9 per unit voltage 1 second after the fault has cleared
- The failure of transient voltage response to meet criteria is often referred to as Fault Induced Delayed Voltage Recovery (FIDVR)
 - FIDVR is driven by end-use load behavior and load composition (primarily the induction motor loads)
 - The dynamic load models that are currently implemented are simplistic representations that allow for modeling the dynamic behavior of induction motor loads



Transient Voltage Response Results

- **Transient voltage response issues are observed on Con Edison's non-BPTF system from 2025 through 2030**
 - Transient voltage response issues are observed in the Greenwood / Fox Hills 138 kV Transmission Load Area (TLA) and the East 13th Street 138 kV TLA for two design contingency events (UC25A and UC25B)
- **Transient voltage response issues are also observed on Con Edison's BPTF starting in 2029**
 - Transient voltage response issues are observed on the 345 kV system for the same events (UC25A and UC25B)

Event Name	Description
UC25A	Fault at Ravenswood 3 345 kV and L/O Ravenswood 3
UC25B	Fault at Rainey 345 kV and L/O 60L 345 kV circuit

Non-Bulk Generic Solution

- The transient voltage response issues are observed first on the non-BPTF system starting in 2025
- The table below provides a summary of compensatory reactive power (MVar) to address the non-BPTF issues
- The compensatory MVar are measured by modeling generic static synchronous compensators (STATCOMs) at the Greenwood 138 kV and East 13th Street 138 kV buses
 - The compensatory MVar additions are not intended to represent specific solutions. Rather, the compensatory MVar provides a generic order-of-magnitude measure of the deficiency. The impact of specific solutions can depend on the type of the solution and its location on the grid

Transmission Load Area (TLA)	Compensatory MVar	
	2025	2030
Greenwood / Fox Hills 138 kV	100	200
East 13th Street 138 kV	50	275
Total	150	475

Impact of Solutions to Non-Bulk Deficiencies

- The table below shows that (1) the non-BPTF deficiencies must be addressed first in 2025, and (2) the compensatory MVar for the non-BPTF deficiency is greater than what would be needed to address solely the BPTF issues that arise in 2029
- Once the non-BPTF issues are addressed, no BPTF issues are observed

Year	Compensatory MVar Location (1)			Total Compensatory MVar	BPTF Resolved	Non-BPTF Resolved
	Farragut 345 kV	E. 13 th St 138 kV	Greenwood 138 kV			
2025	0	50	100	150	N/A (2)	Yes
2030	250	0	0	250	Yes	No (3)
2030	0	125	125	250	Yes	No (3)
2030	0	275	200	475	Yes	Yes

Notes

1. Please see prior slide regarding the use of compensatory resources.
2. No BPTF issues are observed in 2025
3. Improvements are observed in non-BPTF but not enough to resolve the needs

Next Steps

- Con Edison will address the non-BPTF violations with a Corrective Action Plan as required by NERC Standard TPL-001-4. The Corrective Action Plan will also be documented in an update to their Local Transmission Plan
- The analysis demonstrates that when the non-BPTF violations are addressed, no BPTF violations are observed. Therefore, there are no remaining Reliability Needs, and the NYISO will not solicit solutions in the 2020-2021 cycle of the Reliability Planning Process
- The NYISO and Con Edison will continue to evaluate potential alternate modeling techniques for induction motor load dynamic behavior, as required by NERC Standard TPL-001-4
- The NYISO will proceed to develop the Comprehensive Reliability Plan for stakeholder review later this year

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

