

Offshore Wind Injection Assessment

Yachi Lin

Senior Manager, Transmission Planning

ESPWG

Dec. 1, 2017 KCC



DRAFT – FOR DISCUSSION PURPOSES ONLY

©COPYRIGHT NYISO 2017. ALL RIGHTS RESERVED

Background

- This assessment was conducted by the NYISO pursuant to a confidential request by the New York State Department of Public Service (DPS)
- The DPS request asked for a power flow assessment related to the injection of 2,400 MW of offshore wind into various locations in Zone J (New York City) and K (Long Island)
 - The intent of the study was to determine a sample set of injection points that can accommodate the injection of 2,400 MW of offshore wind with a focus on thermal violations

Considerations Outside the Scope of Assessment

- This is NOT an interconnection study. System and substation specific upgrades will be identified based on project proposals in the interconnection process.
- The assessment did not review:
 - (i) thermal impacts to non-BPTF facilities,
 - (ii) voltage or stability impacts,
 - (iii) deliverability of year-round energy or capacity to loads,
 - (iv) operability and expandability of the transmission system, or
 - (v) impact to the New York system reserve margin.

Study Assumptions

- Injection locations in New York City and Long Island were selected by DPS Staff and NYSERDA to serve as proxy injection points for this assessment
- The assessment only evaluated the impact of injecting offshore wind on Bulk Power Transmission Facilities (BPTF) with a focus on thermal violations

Study Assumptions – cont.

- The models for this assessment were developed from the NYISO 2016 Reliability Needs Assessment representation of year 2022
- Transmission and generation resources were modified based on DPS/NYSERDA inputs (see next page) to approximate Year 2030
- Summer peak and summer light load conditions

- Load forecast based on 2016 Gold Book

Load Period	NYCA	Zone J	Zone K
Summer Peak	33,650	11,785	5,414
Light Load	14,025	4,950	2,270

Study Assumptions - cont

Transmission Resource Modifications		Generation Resource Modifications	
AC transmission public policy project ¹	In-Service	Indian Point Unit 2 & 3	Out-of-Service
PSEG/Con Edison Non-Conforming Wheeling Service	0 MW	Q# 444 Cricket Valley Energy Center	In-Service
Q#363 Poseidon Transmission	Out-of-Service	James A. Fitzpatrick	In-Service
		R.E. Ginna	Out-of-Service
		Q# 251 CPV Valley Energy Center	In-Service

Note:

1. A generic upgrade not specific to any proposal is assumed for this analysis.

Dispatch Options

- To inject 2,400 MW into the various points of Zones J and K, the power output from existing generators must be reduced to maintain the balance of generation and load within the model. Dispatch options were developed and are summarized below:

Dispatch Priority	Description
1	New York City and Long Island gas turbines commissioned prior to 1990
2	Priority 1 plus New York City and Long Island steam-only turbines. Steam units, if committed, were not allowed to be turned off. They could be dispatched down to their respective minimum generation levels if needed.
3	Priority 2 plus New York City and Long Island combined cycle units. Combined cycle units treated the same as steam units (see above)
4	Priority 3 plus New York City and Long Island gas turbines commissioned in or after 1990
5	Priority 4 plus imports into SENY from Upstate NY

Study Methodology

- The transmission security assessment, including N-0, N-1, and N-1-1 thermal analysis
- Monitored BPTF elements in Zones I, J, and K
- Contingencies evaluated included all events in Zones I, J, and K that are impactful to the BPTF system in those areas
- Two different methodologies were developed for N-1-1 offshore wind injection analysis

Offshore Wind Dispatch Methodology #1

■ Flexible Off-Shore Wind Dispatch

- MW amounts adjusted among the injection points provided the sum total is greater than or equal to 2,400 MW
- Evaluated whether 2,400 MW of offshore wind could be maintained for all event combinations
- Assessment was performed using the Priority 2 dispatch for the summer peak load conditions and Priority 5 dispatch for the summer light load conditions

Offshore Wind Dispatch Methodology #2

■ Fixed Offshore Wind Dispatch

- MW level changes among the injection points were not allowed
- Assessment was performed using the Priority 5 dispatch for both summer peak and summer light load cases

Conclusions

- Sample combinations of injections points were identified by both the first and second method that would not cause thermal violations on BPTF.
- Other combinations are also possible
- Analysis supports the conclusion that it is feasible to accommodate the injection of 2,400 MW of offshore wind from a thermal bulk transmission security perspective

The Mission of the New York Independent System Operator is to:

- Serve the public interest and
- Provide benefit to stakeholders 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 policy makers, stakeholders and investors in the power system



www.nyiso.com

ISO NEW YORK
INDEPENDENT
SYSTEM OPERATOR

DRAFT – FOR DISCUSSION PURPOSES ONLY

©COPYRIGHT NYISO 2017. ALL RIGHTS RESERVED