2017 Interim Area Transmission Review of the New York State Bulk Power Transmission System

A Draft Report by the New York Independent System Operator

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1. Introduction

The New York Independent System Operator (NYISO) conducts an annual Area Transmission Review (ATR) of the New York State Bulk Power System (BPS) as required by the Northeast Power Coordinating Council (NPCC) [1] and the New York State Reliability Council (NYSRC) [2]. The Bulk Power Transmission Facilities (BPTF), as defined in this review, includes all of the facilities designated by the NYISO to be part of the BPS as defined by NPCC and the NYSRC; additional non-BPS facilities are also included in the BPTF. The purpose of this assessment is to demonstrate conformance with the applicable NPCC Transmission Design Criteria and NYSRC Reliability Rules.

This comprises the first Interim ATR since the 2015 NYISO Comprehensive Area Transmission Review (CATR) [3], which was followed by the 2016 Intermediate ATR.

The Guidelines and Procedures for NPCC Area Transmission Reviews require each Area to conduct a CATR at least every five years and either an Interim or an Intermediate ATR in each of the years between CATRs, as appropriate. The most recent NYISO CATR (2015) [3] performed by NYISO was approved by the NPCC Reliability Coordinating Council (RCC) in June 2016.

This assessment is conducted in accordance with the requirements for an Interim Review as described in the NPCC Directory #1 [1] - Appendix B "Guidelines and Procedures for NPCC Transmission Reviews" and the NYSRC "Procedure for New York Control Area Transmission Reviews"[2]. The 2017 Interim ATR assesses the reliability impacts of changes in forecasted system conditions and planned New York State BPTF since the 2015 NYISO CATR [3], and is conducted for Year 2022.

2. Forecasted System Conditions and Planned Facilities

The forecasted system conditions and planned generation and transmission facilities assessed in the NYISO 2015 CATR [3] were based on the 2015 NYISO Load and Capacity Data Report (NYISO Gold Book). This Interim Review is based on the forecasted conditions and planned facilities from the 2017 NYISO Load and Capacity Data Report [4] for the year 2022. Tables 1-4 summarize the forecasted conditions and planned facilities for this review and the 2015 Comprehensive Review [3] for comparison.

2.1 Load Forecast

Table 1 provides a comparison between the statewide coincident peak load forecast in the 2017 Interim ATR and the 2015 CATR [3]. The 2017 statewide coincident peak load forecast for summer 2022 for the New York Control Area (NYCA) is 33,034 MW, which is 1,275 MW less than the summer 2020 forecast of 34,309 MW used in the NYISO 2015 CATR [3].

2.2 Capacity Resources

The 2017 forecast from the NYISO 2017 Load and Capacity Data report [4] for generating facilities in New York in 2022 is 38,713 MW.[1] The corresponding installed capacity for the 2022 summer is 42,161 MW, which includes Special Case Resources (SCR, or demand response) of 1,192 MW, and 2,256 MW of net capacity transactions from external areas. Compared to the 2015 CATR [3], there is a decrease of 1,618 MW, which accounts for generation additions and retirements. Retirements are based on notices of intent to retire or mothball received by the NYISO as of May 01, 2017. The reserve margin is 27.6%, which is well above the required Installed Reserve Margin (IRM) of 18% approved by the NYSRC for the 2017-2018 capability period.

Proposed generation projects and announced generation shutdowns or derates are shown in Table 2 and Table 3 respectively, and reflect any changes since the NYISO 2015 CATR [3]. The NYISO has a Generator Deactivation process to determine any reliability impacts due to the noticed deactivation of a generator. The NYISO, along with the responsible New York Transmission Owners (NYTO), performs transmission security and system stability assessments as part of the Generator Deactivation Assessment (GDA) and the generators that did not have any reliability need are listed in Table 3.

2.3 Transmission Facilities

The transmission plans shown in Table 4 reflect changes since the NYISO 2015 CATR [3] including project cancellations and new projects. There have been no additional bulk power transmission facilities proposed for the NYCA beyond those in the NYISO 2017 Load and Capacity Data report [4]. The 2016 Intermediate ATR had three Corrective Action Plans. Each Clay – Pannell 345kV has terminal equipment upgrades. These upgrades are scheduled to be in-service in 2019. The other Corrective Action Plan is the Oakdale 345/115kV 3rd transformer and 345kV reconfiguration project. This project is scheduled to be in-service in 2021.

[1] This includes the Fitzpatrick generation facility due to their notice to withdraw their deactivation notice.

3. Impact Assessments

The 2015 Comprehensive Area Transmission Review [3] assessed and evaluated thermal, voltage, and stability performance of the New York State BPTFs for design and extreme contingencies as required by NPCC Directory #1 [1] and NYSRC Reliability Rules [2]. The 2015 CATR [3] results confirmed that the base case meets criteria, and by limiting power transfers consistent with the transfer limits reported in the 2015 CATR [3], the security of the New York State BPTFs will be maintained and projected demand will be supplied.

Changes noted in Tables 2, 3 and 4 were either studied in the 2016 Intermediate ATR or otherwise assessed as not impactful to the BPS. No impacts to reliability of the BPS were determined. No Corrective Action Plans are required.

3.1 Special Protection Systems

New York has added a new type–III SPS#222 since the 2015 CATR [3]. System conditions have not changed sufficiently enough to impact the operation or classification of existing SPS. New York has retired SPS since the 2015 CATR [3]. These retired SPS have been assessed through the NPCC SPS retirement evaluation process.

3.2 Dynamic Control Systems

System conditions have not changed sufficiently to impact the operation or classification of previously reviewed DCS since the 2015 Comprehensive Review [3].

3.3 Short Circuit Assessment

System condition changes from the 2015 CATR [3] consisted mainly of generation retirements. The fault duty at BPTF buses in the short circuit representation is expected to be no worse than the 2020 peak load model used in the 2015 CATR [3].

3.4 Review of Exclusions from NPCC Basic Criteria

The NPCC Directory #1 [1] contains a provision that allows a member to request an exclusion from criteria contingencies that are "simultaneous permanent phase to ground faults on different phases of each of two adjacent transmission circuits on a multiple circuit tower, with normal fault clearing." NYISO does not have any such exclusion at this time therefore none were reviewed. Furthermore, NYISO does not anticipate requesting any exclusion in the near future.

3.5 System Restoration Assessment

NYSRC Reliability Rules B.2-R1.3 [2] requires the NYISO to evaluate the impact of system

expansion or reconfiguration plans on the NYCA System Restoration Plan:

- The Rochester Gas & Electric (RG&E) Rochester Transmission Reinforcement is a planned 345/115 kV substation (Station 255) located approximately 2 miles west of Station 80, connecting to the two Niagara-Rochester 345 kV lines. This addition also corresponds with a reconfiguration of Station 80.
- RG&E has a planned reconfiguration to the existing Pannell 345 kV station (Station 122).
- The NYSEG Watercure 345/230 kV transformer is an addition to the existing Watercure facility. Additionally, the Watercure 345 kV substation has reconfiguration plans.
- The NYSEG Gardenville 230/115 kV transformer is an addition to the Gardenville facility.
- The NYSEG Oakdale 345/115/34.5 kV transformer is an addition to the existing Oakdale facility. The Oakdale 345 kV substation has reconfiguration plans.
- The NYSEG Fraser 345/115 kV transformer is an addition to the existing Fraser facility.
- The NYSEG Coopers Corners 345/115kV transformer is an addition to the existing Coopers corners facility. The Coopers Corners 345kV substation has reconfiguration plans

The potential impacts of the system expansion plans listed above have been communicated to NYISO Operations Engineering for consideration in the annual review and update of the NYCA System Restoration Plan.

3.6 NYSRC Local Rules Assessment

The NYSRC has adopted Local Reliability Rules [2] that apply to New York City and Long Island zones to protect the reliable delivery of electricity for specific electric system characteristics and demographics relative to these zones. The NYISO requests information from the local Transmission Owners on changes in local system conditions that would impact the New York State BPS at the beginning of every year. The base conditions are described in Section 2 of this report, and adherence to the following local rules to the system models used for this year's assessments is shown below:

G.1(R2) Operating Reserves/Unit Commitment, G.1(R3) Locational Reserves (New York City)

Local Operating Reserve rules are considered in the development of the base case used for all reliability assessments.

G.2 Loss of Generator Gas Supply (New York City), G.3 Loss of Generator Gas Supply (Long Island)

Specific loss of generator gas supply studies are performed by Con Edison and PSEG-Long Island and are reviewed by the NYISO. The planned system is expected to be compatible with local rules

regarding loss of generator gas supply.

G.1(R4) Thunderstorm Watch (New York City)

Proposed facilities included in this assessment may impact the Thunderstorm Watch contingency list due to substation reconfiguration and facility additions. The contingencies impacted by system facility changes will be evaluated before the proposed facilities are in-service.

3.7 Extreme System Condition Assessment

NPCC Directory #1 [1] and the NYSRC Reliability Rules [2] require assessment of extreme system conditions, which have a low probability of occurrence, such as loss of major gas supply and extreme peak load level resulting from extreme weather conditions. The 2015 CATR (Section 5) found no significant voltage violations, thermal overloads, or stability issues under evaluated gas shortage and extreme weather conditions. System conditions have not changed sufficiently to impact the findings of the 2015 CATR [3] and 2016 Intermediate ATR.

4. Overview Summary

The annual reliability assessment performed in this Interim Review of the changes in forecasted NYCA system conditions and planned facilities indicate the New York State Bulk Power Transmission Facilities, as planned through the year 2022, conform to the reliability criteria described in the NYSRC Reliability Rules [2] and NPCC Directory #1 [1].

Tables and Graphs

Table 1: Load and Capacity Schedule

	Comprehensive Review: 2015 Forecast for Summer 2020	Intermediate Review: 2016 Forecast for Summer 2021	Interim Review: 2017 Forecast for Summer 2022	Change from Previous CATR
Peak Load (MW)	34.309 (2)	33,555 (2)	33,034 (2)	-1275
Total Capacity (MW)	43,779 (1)	41,048 (1)	42,161 (3)	-1618
Reserve Margin	27%	22%	27.6%	0.6%

Notes:

1. Total Capacity amount is derived from the NYISO Gold Book and represents the Total Resource Capability from Table V-2a of the NYISO Gold Book.
2. Peak Load amount is derived from the NYISO Gold Book and represents the Peak Demand Forecast from Table I-2a of the NYISO Gold Book.
3. Total Capacity amount is derived from the NYISO Gold Book and represents the Total Resource Capability from Table V-2a of the NYISO Gold Book. On April 10, 2017, Fitzpatrick generator withdrew its generator deactivation notice previously provided on November 2, 2015; therefore, Fitzpatrick generation has been added.

Table 2: Additions/Uprates in Generation Facilities

Additions/Uprates	Size (MW)	2015 CATR: Included/IS Date	2016 Intermediate ATR: Included/IS Date	2017 Interim ATR: Included/IS Date
Bethlehem Energy Center Uprate	72.0	N/2017-2018	Y/2017-2018	Y/2017-2018
Rochester Gas & Electric Station 2 Uprate	6.3	N/2018-09	Y/2018-09	Y/2018-09
CPV Valley Energy Center	677.6	Y/2017-10	Y/2017-10	Y/2018-02
Greenidge Generation	106.3	N	N	Y/2017-03

Table 3: Shutdowns/Deratings in Generation Facilities

Shutdowns/ Deratings	Size (MW)	2015 CATR: Included/IS Date	2016 Intermediate ATR: Included/IS Date	2017 Interim ATR: Included/IS Date
Niagara Bio-gen	39.7	In-Service	Out of Service	Out of Service
Astoria GT 05	12.3	In-Service	Out of Service	Out of Service
Astoria GT 07	11.5	In-Service	Out of Service	Out of Service
Astoria GT 08	11.4	In-Service	Out of Service	Out of Service
Astoria GT 10	18.4	In-Service	Out of Service	Out of Service
Astoria GT 11	16.5	In-Service	Out of Service	Out of Service
Dunkirk 2	75	In-Service	Out of Service	Out of Service
Dunkirk 3	185	In-Service	Out of Service	Out of Service
Dunkirk 4	185	In-Service	Out of Service	Out of Service
Huntley 67	187.9	In-Service	Out of Service	Out of Service
Huntley 68	189.5	In-Service	Out of Service	Out of Service
Cayuga 1	150.1	2017-07	2017-07	Out of Service
Cayuga 2	150.4	2017-07	2017-07	Out of Service
Fitzpatrick 1	852.9	In-service	2017-01	In-Service
Ginna	581.4	In-service	2017-04	Out of Service
Ravenswood 04	12.9	In-service	2016-04	Out of Service
Ravenswood 05	15.5	In-Service	2016-04	Out of Service
Ravenswood 06	12.6	In-Service	2016-04	Out of Service
Shoreham GT3	45.4	In-Service	In-Service	2017/08
Shoreham GT4	44.6	In-Service	In-Service	2017/08
Freeport EQUS GT1	47.5	In-Service	In-Service	2017/10

Table 4: Changes in Bulk Power Transmission Facilities

Bulk Transmission	2015 CATR: Included/IS Date	2016 Intermediate ATR: Included/IS Date	2017 Interim ATR: Included/IS Date
CPV Valley 345kV Substation (Q#251)	Y/2016-05	Y/2017-10	Y/2018W
Leeds-Hurley Series Compensation SDU	Y/2018S	Y/2018S	Y/2019S
Rochester Transmission Reinforcement 345 kV Substation (Q#339) (1)	Y/2019W	Y/2020W	Y/2021S
Con Edison Rainey-Corona Transformer/Phase Shifter	Y/2019S	Y/2019S	Y/2019S
Con Edison Goethals-Linden 345 kV Feeder Separation	Y/2016S	Y/2016S	Y/In-Service
NYPA Marcy-Coopers Corners 345 kV Series Compensation	Y/2016S	Y/In-Service	Y/In-Service
NYPA Edic-Fraser 345 kV Series Compensation	Y/2016S	Y/In-Service	Y/In-Service
NYPA Fraser-Coopers Corners 345 kV Series Compensation	Y/2016S	Y/In-Service	Y/In-Service
NYSEG Watercure 345/230 kV Transformer	Y/2018S	Y/2018S	Y/2019S
NYSEG Coopers Corners 345 kV Shunt Reactor	Y/2015S	Y/In-Service	Y/In-Service
NYSEG Gardenville 230/115 kV Transformer	Y/2017S	Y/2017S	Y/2021S
NYSEG/N. Grid Five Mile Rd 345 kV (New Substation)	Y/2015W	Y/In-Service	Y/In-Service
NYSEG Mainesburg 345/115 kV Substation (Q#394)	Y/2015S	Y/In-Service	Y/In-Service
RG&E Station 122 Station Upgrade (Transformers)	Y/2016W	Y/2017S	Y/2017S
O&R Sugarloaf 345/138 kV (New Substation)	Y/2016S	Y/2016S	Y/In-Service
Feeder 76 Ramapo to Rock Tavern (Q#368)	Y/2016S	Y/2016S	Y/In-Service
N. Grid Porter Reactors	Y/2017W	Y/2018S	Y/2018S
N. Grid Clay – Lockheed Martin 115 kV Reconductoring	Y/2016W	Y/In-Service	Y/In-Service
N. Grid Clay – Dewitt 115 kV Reconductoring	Y/2017W	Y/2017W	Y/2017W
N. Grid Clay – Teall 115 kV Reconductoring	Y/2017W	Y/2017W	Y/2017W
N. Grid Clay-Woodard 115 kV (Conductor Clearance)	Y/2015W	Y/In-Service	Y/In-Service
N. Grid Packard – Huntley 77/78 Series Reactors	N/2016S	Y/2016S	Y/In-Service
N. Grid Eastover Road 230/115 kV Transformer	N/2017S	Y/2017S	Y/2018S
O&R Lovett 345kV Station (New Station)	N/2018S	Y/2018S	Y/2019W
Poseidon Transmission, LLC	N	N	Y/2020

Bulk Transmission	2015 CATR: Included/IS Date	2016 Intermediate ATR: Included/IS Date	2017 Interim ATR: Included/IS Date
NYSEG Wood Street 345/115 kV Transformer	N	N	Y/2021W
NYSEG Oakdale 345/115/34.5 kV Transformer and Station Reconfiguration	N	N	Y/2021W
NYSEG Coopers Corners 345/115 kV Transformer and Station Reconfiguration	N	N	Y/2021W
NYSEG Fraser 345/115 kV Transformer and Station Reconfiguration	N	N	Y/2021W
RG&E Station 122- Pannell- PC1 and PC2 Relay Replacement	N	N	Y/2019S
RG&E Station 80 Station Reconfiguration	N	N	Y/2017S

References

1. Northeast Power Coordinating Council, “NPCC Regional Reliability Reference Directory #1, Design and Operation of the Bulk Power System”, Version 2, dated September 30, 2015.
2. New York State Reliability Council, “Reliability Rules and Compliance Manual”, Version 40, dated April 13, 2017.
3. New York Independent System Operator, “2015 Comprehensive Area Transmission Review of the New York State Bulk Power Transmission System”, Final Report, dated June 1, 2015.
4. New York Independent System Operator, “2017 Load and Capacity Data”, Revision Final, dated April 2017.