



Annual Transmission Planning and Evaluation Report (FERC Form No. 715)

**A Report by the
New York Independent System Operator**

April 1, 2021

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About the New York Independent System Operator

The New York Independent System Operator, Inc. (“NYISO”), headquartered in Rensselaer, New York, is an independent, nonprofit corporation established to maintain the continued reliable operation of the New York State (“NYS”) bulk electric system, and to facilitate the wholesale electricity markets throughout the State. NYISO began operation on November 18, 1999, and formally assumed responsibility for operation of the bulk electric system from the New York Power Pool (“NYPP”) on December 1, 1999. NYISO is regulated by the Federal Energy Regulatory Commission (“FERC” or “the Commission”).

NYISO provides for reliable and efficient operation of the NYS bulk electric system by coordinating operation of the state’s bulk power transmission facilities, and by committing and dispatching generation resources throughout the state on a single-system basis, in accordance with prescribed reliability rules. NYISO coordinates transmission service and facilitates the state’s wholesale electricity markets through the NYISO Open Access Transmission Tariff (“OATT”), the NYISO Market Administration and Control Area Services Tariff, and various agreements. NYISO also performs studies in support of planning of the NYS electric system, and to evaluate the impact of proposed interconnections of new generation, transmission, and load facilities to the transmission system.

The NYS electric system is part of a continental power system that encompasses the eastern United States and eastern Canada. NYISO is a registered entity of the North American Electric Reliability Corporation (“NERC”), the mission of which is to ensure the reliability of the North American bulk electric system. NYISO is also a member of the Northeast Power Coordinating Council (“NPCC”), which is one of eight regional entities of NERC covering the region comprised of New York, New England, Ontario, Quebec, and the Maritimes (New Brunswick, Nova Scotia, and Prince Edward Island). Together, NERC and the regional entities establish reliability standards for the interconnected electric systems, and monitor the compliance of the industry participants, and organizations such as the NYISO, to those standards. In addition, NYISO is also subject to the reliability rules of the New York State Reliability Council (“NYSRC”), an organization established to address the special reliability needs of NYS.

NYISO conducts transmission operation and planning activities in coordination with nine transmission owners and operators in NYS (“NYTOs”), which are:

- Central Hudson Gas & Electric Corporation
- Consolidated Edison Company of New York, Inc.
- Long Island Power Authority
- New York Power Authority

- New York State Electric & Gas Corporation
- New York Transco, LLC
- Niagara Mohawk, A National Grid Company
- Orange and Rockland Utilities, Inc.
- Rochester Gas and Electric Corporation

Foreword

This is the NYISO Annual Transmission Planning and Evaluation Report (“FERC Form No. 715 Report” or “FERC-715 Report”) for 2021. NYISO is submitting a paperless filing again this year. This report was prepared in accordance with the FERC Form No. 715 - Annual Transmission Planning and Evaluation Report Instructions¹ and in accordance with the 2021 Filing Instructions for a paperless submittal.²

In 2000, NYISO assumed responsibility for filing the annual FERC-715 Report on behalf of the NYTOs, a task previously performed by the NYPP. Also, the NYISO conducts transmission planning activities in coordination with the NYTOs, each of which are “transmitting utilities” as defined by FERC. The NYTOs are identified in Part 1 of this report. For this filing, the NYISO is also filing on behalf of Alcoa Power Generating Inc. Long Sault Division.

This report consists of six parts, corresponding to the six parts specified in the FERC-715 Instructions. In accordance with the FERC-715 Instructions, references are provided only to documents that were provided in a previous FERC-715 report and have not changed. For Part 3, all of the most recent maps and diagrams are provided in PDF files, in accordance with the Commission’s instructions for a paperless submittal.

All but one document in Part 2 and the one-line diagrams in Part 3 have been labeled as Critical Energy Infrastructure Information (“CEII”), in accordance with NYISO’s policies and procedures, and are not attached to this public report. NYISO understands that the Commission considers the information collected in FERC-715 as CEII.

The non-CEII portions of this report will be available from the NYISO public web site at

(<https://www.nyiso.com/ny-power-system-information-outlook>). Access to portions of the report that contain CEII will be restricted to parties that obtain or have the proper authorization. Instructions for requesting CEII contained in this report are provided in Appendix A.

The information contained in this report pertains to NYISO transmission planning and evaluation matters in general, and is valid as of the April 1, 2021 filing date. In the event that this information may be used for a specific purpose, the user may wish to contact NYISO or the appropriate NYTO contact person(s) identified in Part 1 of this report to ascertain whether this information is appropriate and sufficient for the intended purpose.

¹ [FERC 715 Report Instructions](#) (“Form No. 715 Instructions”)

² [FERC 715 Filing Instructions](#)

Part 1: Identification and Certification

The certifications of the authorized officials of each of the transmitting utilities that provided information to NYISO for this filing are included in this part of the report.

Organization Names and Addresses

New York Independent System Operator

10 Krey Boulevard
Rensselaer, NY 12144

Central Hudson Gas & Electric Corporation

284 South Avenue
Poughkeepsie, NY 12601-4879

New York State Electric & Gas Corporation

18 Link Drive
Binghamton, NY 13904

Consolidated Edison Company of New York, Inc.

4 Irving Place
New York, NY 10003

New York Transco, LLC

1 Hudson City Center Suite 300
Hudson NY, 12534

Long Island Power Authority

333 Earle Ovington Boulevard
Suite 403
Uniondale, NY 11553

Niagara Mohawk, A National Grid Company

300 Erie Boulevard West
Syracuse, NY 13202

New York Power Authority

123 Main Street
White Plains, NY

Orange and Rockland Utilities, Inc.

390 Route 59
Spring Valley, NY 10977

Alcoa Power Generating Inc. Long Sault Division

C/O Alcoa USA Corp.
1814 St. Hwy 131
Massena, NY 13662

Rochester Gas and Electric Corporation

89 East Avenue
Rochester, NY 14649

Contact Persons

| <u>Organization</u> | <u>Contact Name/Title</u> | <u>Telephone/Fax/email</u> |
|---|---|---|
| New York Independent System Operator | Kevin S. DePugh Sr. Manager, Reliability Planning | 518-356-6144 518-356-7570 kdepugh@nyiso.com |
| Central Hudson Gas & Electric Corporation | Richard Wright Senior Engineer Electric Transmission Planning | 845-486-5463 845-486-5697 rwright@cenhud.com |
| Consolidated Edison Company of New York, Inc. | Aleksandra Gofman Senior Engineer Transmission Planning | 212-460-6116 212-529-1130 GOFMANA@coned.com |
| PSEG Long Island, Agent for Long Island Power Authority | Nicholas Culpepper Manager, Transmission Planning PSEG Long Island Agent for Long Island Power Authority | 516-949-7274 Nicholas.Culpepper@pseg.com |
| New York Power Authority | Xia Jiang Director, Transmission Planning | 914-681-6304 914-681-6932 Xia.Jiang@nypa.gov |
| New York State Electric & Gas Corporation, and Rochester Gas and Electric Corporation | Ayman Elkasrawy Associate Engineer Transmission Planning | 585-771-2931 Ayman_elkasrawy@rge.com |
| New York Transco, LLC | Paul Haering Vice President, Capital Investments | 518-444-4880 Paul.Haering@NYTransco.com |
| Niagara Mohawk Power Corporation | Mark F. Domino Engineering Manager, Transmission Planning - NY National Grid USA Service Co. Acting as agent for Niagara Mohawk | 315-428-5781 Mark.Domino@nationalgrid.com |
| Orange and Rockland Utilities, Inc. | Roleto Mangonon Principal Engineer, Transmission Planning | 845-577-3326 845-577-3720 mangononr@oru.com |
| Alcoa Power Generating Inc. Long Sault Division | Matthew Fullerton Power System Manager | 315-705-2566 315-705-2780 Matthew.Fullerton@alcoa.com |

CERTIFICATION

I certify that, to the best of my knowledge, the information and data submitted in this form by NYISO staff, on behalf of the transmitting utilities identified in Part 1, is complete and accurate, and in compliance with the “Instructions for Completing Form 715 Annual Transmission Planning and Evaluation Report.”

Kevin DePugh
Sr. Manager, Reliability Planning
New York Independent System Operator

CERTIFICATION

I certify that, to the best of my knowledge, the information and data provided by Central Hudson Gas & Electric Corporation (transmitting utility) to NYISO (designated agent) for this filing is accurate and in compliance with the “Instructions for Completing Form 715 Annual Transmission Planning and Evaluation Report.” I authorize NYISO staff to submit this information and data on our behalf.

Richard Wright
Senior Engineer, Electric Transmission Planning
Central Hudson Gas & Electric Corporation

CERTIFICATION

I certify that, to the best of my knowledge, the information and data provided by Consolidated Edison Company of New York, Inc. (transmitting utility) to NYISO (designated agent) for this filing is accurate and in compliance with the “Instructions for Completing Form 715 Annual Transmission Planning and Evaluation Report.” I authorize NYISO staff to submit this information and data on our behalf.

Aleksandra Gofman
Senior Engineer, Transmission Planning
Consolidated Edison Company of New York, Inc.

CERTIFICATION

I certify that, to the best of my knowledge, the information and data provided by PSEG Long Island, Agent for the Long Island Power Authority (transmitting utility) to NYISO (designated agent) for this filing is accurate and in compliance with the “Instructions for Completing Form 715 Annual Transmission Planning and Evaluation Report.” I authorize NYISO staff to submit this information and data on our behalf.

Nicholas Culpepper
Manager, Transmission Planning
PSEG Long Island
Agent for the Long Island Power Authority

CERTIFICATION

I certify that, to the best of my knowledge, the information and data provided by New York Power Authority (transmitting utility) to NYISO (designated agent) for this filing is accurate and in compliance with the “Instructions for Completing Form 715 Annual Transmission Planning and Evaluation Report.” I authorize NYISO staff to submit this information and data on our behalf.

Xia Jiang
Director, Transmission Planning
New York Power Authority

CERTIFICATION

I certify that, to the best of my knowledge, the information and data provided by New York State Electric & Gas Corporation and Rochester Gas and Electric Corporation (transmitting utilities) to NYISO (designated agent) for this filing is accurate and in compliance with the “Instructions for Completing Form 715 Annual Transmission Planning and Evaluation Report.” I authorize NYISO staff to submit this information and data on our behalf.

Ayman Elkasrawy

Associate Engineer, Transmission Planning
New York State Electric & Gas Corporation and
Rochester Gas and Electric Corporation

CERTIFICATION

I certify that, to the best of my knowledge, the information and data provided by New York Transco, LLC (transmitting utility) to NYISO (designated agent) for this filing is accurate and in compliance with the “Instructions for Completing Form 715 Annual Transmission Planning and Evaluation Report.” I authorize NYISO staff to submit this information and data on our behalf.

Paul Haering
Vice President, Capital Investments
New York Transco, LLC

CERTIFICATION

I certify that, to the best of my knowledge, the information and data provided by Niagara Mohawk Power Corporation, dba National Grid (transmitting utility) to NYISO (designated agent) for this filing is accurate and in compliance with the “Instructions for Completing Form 715 Annual Transmission Planning and Evaluation Report.” I authorize NYISO staff to submit this information and data on our behalf.

Mark F. Domino

Engineering Manager, Transmission Planning - NY

National Grid USA Service Co.

Acting as agent for Niagara Mohawk Power Corporation

CERTIFICATION

I certify that, to the best of my knowledge, the information and data provided by Orange and Rockland Utilities, Inc. (transmitting utility) to NYISO (designated agent) for this filing is accurate and in compliance with the “Instructions for Completing Form 715 Annual Transmission Planning and Evaluation Report.” I authorize NYISO staff to submit this information and data on our behalf.

Roleto Mangonon
Principal Engineer, Transmission Planning
Orange and Rockland Utilities, Inc.

CERTIFICATION

I certify that, to the best of my knowledge, the information and data provided by Alcoa Power Generating Inc. Long Sault Division (transmitting utility) to NYISO (designated agent) for this filing is accurate and in compliance with the “Instructions for Completing Form 715 Annual Transmission Planning and Evaluation Report.” I authorize NYISO staff to submit this information and data on our behalf.

Matthew Fullerton
Power System Manager
Alcoa Power Generating Inc. Long Sault Division

Part 2: Power Flow Base Cases

The following power flow base cases are included in this part of the report:

- Case #1: Summer 2021 Peak Load
- Case #2: Winter 2021/2022 Peak Load
- Case #3: Spring 2022 Light Load
- Case #4: Summer 2022 Peak Load
- Case #5: Summer 2022 Peak Load based on a 90/10 statewide forecast
- Case #6: Winter 2022/ 2023 Peak Load
- Case #7: Spring 2026 Light Load
- Case #8: Summer 2026 Peak Load
- Case #9: Summer 2026 Peak Load based on a 90/10 statewide forecast
- Case #10: Winter 2026/ 2027 Peak Load
- Case #11: Summer 2031 Peak Load
- Case #12: Summer 2031 Peak Load based on a 90/10 statewide forecast

NYISO and the NYTOs named in Part 1 participate in the NPCC regional base case development process. NYISO maintains a centralized database of power flow data for the NYS electric power system for use in both planning and operating studies. Through an annual process, the NYTOs provide data to NYISO to update the NYS power flow base cases, and NYISO in turn updates its centralized database and provides data to NPCC to update its regional base cases. NPCC compiles the regional base cases and makes them available to its members and to NERC.

The above base cases were initially based on the Eastern Interconnection Reliability Assessment Group (“ERAG”) Multiregional Modeling Working Group (“MMWG”) 2020 base cases. The NYISO reviewed and updated the NYS and outside area representations in these cases based on information provided to NYISO up through approximately March 3, 2021.

The first and second cases are developed for use as part of the NYISO summer 2021 and winter 2021/2022 Operating Studies. In general, these cases represent the existing transmission system and system conditions expected to occur at the time of the respective seasonal peak load. These cases would be appropriate for use as a starting point for current year (2021) transmission studies.

The last ten cases represent the planned transmission system and forecasted system conditions in future years, in this case, 2022 (near-term), 2026 (mid-term) and 2031 (long-term). The four near-term cases were developed to satisfy NERC standards requirements for near-term (one year out) transmission

assessments. The near-term cases represent only proposed new or modified generation and transmission facilities that are planned to occur within that time frame. The NYS representations for the mid-term and long-term cases include only those future new or modified generation and transmission facilities that: (1) have met the inclusion rules set forth in Section 25.5.5.1 of Attachment S to the NYISO's OATT or may meet the Reliability Needs Assessment ("RNA") base cases inclusion rules set forth in the NYISO Reliability Planning Process Manual; (2) have been proposed by the NYTOs as firm projects; and (3) for cross border projects in both the NYISO queue and a neighboring Regional Transmission Operator or Independent System Operator queue, have (a) met the inclusion rules set forth in Section 25.5.5.1 of Attachment S to the NYISO's OATT or may meet the RNA base cases inclusion rules set forth in the NYISO Reliability Planning Process Manual; and (b) may meet the inclusion rules for the most recent cases developed by ERAG MMWG. Other proposed new or modified generation and transmission facilities that may be under study are not represented. The near-term, mid-term and long-term cases would be appropriate for use as a starting point for transmission planning studies in those respective time frames. NYISO expects to use these base cases as a starting point for conducting various planning studies and transmission reliability assessments in 2021.

Each of these power flow cases contains a detailed representation of the NYS electric power system for the given time period, with appropriate reductions of the representations of the electric systems outside NYS. These cases are valid for the study of the NYS system only. Furthermore, these power flow cases and their associated data are intended for power flow analysis only, and are not intended for use in stability, short-circuit, or other types of analyses.

The NYS system load model utilized in the peak load base cases is representative of a statewide coincident peak load for baseline load growth and weather conditions. Baseline peak weather conditions are 50/50 for all NYTO service areas except for Consolidated Edison Company of New York and Orange and Rockland Utilities which are 67/33. This value may be lower than the sum of the individual NYTOs' peak loads since these individual peak loads generally do not occur at the same time. The NYS system load model utilized in the spring light load base case represents a load level equal to approximately 45% of the statewide coincident summer peak load level. As in prior years, in addition to the summer peak baseline load cases, the NYISO includes three additional summer peak load cases based on a 90/10 statewide peak load forecast (referred to as Case#5, Case#9 and Case#12 above). A 50/50 forecast means that, on a probability distribution curve, there is a 50% chance that the actual peak load will be below the forecast value, and a 50% chance of it being above the forecast. A 67/33 forecast means that there is a 67% chance that the actual peak load will be below the forecast value, and a 33% chance of it being above the forecast. A 90/10 forecast means that there is a 90% chance that the actual peak load will be below the forecast

value, and a 10% chance of it being above the forecast. NYISO uses both the baseline and 90/10 cases in various transmission planning analyses.

The cases are in the SAV data format of the Siemens - Power Technologies, Inc. (“PTI”) Power System Simulator for Engineering (“PSS/E”) power flow program. All twelve cases were created using PSS/E version 34.

The cases have been solved using the fixed-slope decoupled Newton iterative algorithm (“FDNS”) with stepping transformer taps, area interchange and phase shifters engaged, switched shunts and DC line taps unlocked, and VAR limits applied immediately. An acceleration factor of 1.0 and a tolerance of 1.0 MW and MVARr were employed during the solution process. The zero impedance line threshold was set at 0.0001 pu. The cases were developed on a Windows operating system.

The sav files for all twelve base cases are provided in electronic files herewith. The size of the files are approximately 42 MB per case.

In addition to the above power flow base cases, a “data dictionary” is also provided in this filing. The data dictionary contains a listing of bus names and numbers from the Summer 2031 Peak Load case, with corresponding full names for each bus. This data dictionary applies to all twelve base cases.

The data dictionary also contains the Energy Information Administration (EIA) plant codes for generating plants represented in the cases, as appropriate.

The power flow base cases and data dictionary included in this filing are considered CEII and as such, access will be restricted to parties that obtain or have the proper authorization to receive them (see Appendix A).

Part 3: Transmitting Utility Maps and Diagrams

The maps and diagrams provided with this report are as follows:

| Map Name | Latest Version (Date Originally Filed) |
|--|---|
| 2021 NYISO Electric System Map | 2021 |
| NYISO One-Line Diagram of the NYS Bulk Power System | 2021 |
| One-Line Diagrams of Each of the NYTO's systems: | |
| Central Hudson Gas & Electric Corporation | 2019 |
| Consolidated Edison Company of New York | 2021 |
| Long Island Power Authority | 2021 |
| New York Power Authority | 2021 |
| New York State Electric & Gas Corporation and Rochester Gas & Electric Corporation | 2020 |
| New York Transco, LLC | 2021 |
| Niagara Mohawk, A National Grid Company | 2019 |
| Orange & Rockland Utilities, Inc. | 2021 |
| Alcoa Power Generating Inc. Long Sault Division | 2021 |

The 2021 NYISO Electric System Map depicts high voltage transmission facilities (115 kV and above) and major generation facilities within NYS.

The NYISO one-line diagram (4 pages) depicts the existing NYS bulk power system, which consists principally of relatively large generating units and the high voltage transmission system. Generally, bulk power system facilities are generating units that are 300 MW or larger and transmission facilities of 230 kV and above, although smaller generating units and lower voltage transmission on which faults or disturbances can have a significant effect on the continuity of service of the NYS system, or can have a significant effect on areas outside of the NYS system, also are considered part of the bulk power system. An updated one-line diagram is provided with this report.

The NYTO one-line diagrams depict the respective existing transmission and generation facilities of the NYTOs' systems. In some cases, the NYTO one-line diagrams show more detail of the lower voltage transmission system than is shown in the NYISO diagram. The most recent versions of the NYTO diagrams are provided with this report.

The diagrams included in this filing will be restricted to parties that obtain or have authorization to obtain CEII from the NYISO (see Appendix A).

Part 4: Transmission Planning Reliability Criteria

This part includes a listing of any new or revised transmission planning reliability criteria (“criteria”) documents provided with this filing and previously filed criteria documents that are still in effect.

NYISO and the NYTOs are subject to the reliability standards established by NERC. The NERC Reliability Standards are available from the NERC web site at

[\(<http://www.nerc.com/pa/Stand/Pages/ReliabilityStandards.aspx>\)](http://www.nerc.com/pa/Stand/Pages/ReliabilityStandards.aspx).

NYISO and the NYTOs also are subject to the NPCC Criteria and the NYSRC Reliability Rules. In addition, the NYTOs each have supplemental transmission planning reliability criteria as well. The applicable NPCC, NYSRC, and NYTOs criteria documents are listed as document #s 4-26 below.

The new, revised, or previously filed criteria documents that pertain to this filing are as follows:

1. Standard TPL-001-4 – Transmission System Planning Performance Requirements; North American Electric Reliability Corporation, effective date January 1, 2015 (filed 2015).
2. Standard FAC-010-3 – System Operating Limits Methodology for the Planning Horizon, effective date April 1, 2017 (filed 2017).
3. NPCC Regional Reliability Reference Directory #1 Design and Operation of the Bulk Power System (Directory #1); Northeast Power Coordinating Council, September 30, 2015 (filed 2016). The NPCC Directories are available from the NPCC web site at [\(<https://www.npcc.org/content/docs/public/program-areas/standards-and-criteria/directories/directory1-design-and-oper-20200305.pdf>\)](https://www.npcc.org/content/docs/public/program-areas/standards-and-criteria/directories/directory1-design-and-oper-20200305.pdf).
4. NPCC Regional Reliability Reference Directory #12 Under Frequency Load Shedding Program Requirements (Directory #12); Northeast Power Coordinating Council, July 9, 2013 (filed 2014).
5. NYSRC Reliability Rules & Compliance Manual for Planning and Operating the New York State Power System (Version 45); New York State Reliability Council, July 17, 2020 (filed 2021). The NYSRC Reliability Rules are available from the NYSRC web site at [\(<http://www.nysrc.org/PDF/Reliability%20Rules%20Manuals/RRC%20Manual%20V45%20Final.pdf>\)](http://www.nysrc.org/PDF/Reliability%20Rules%20Manuals/RRC%20Manual%20V45%20Final.pdf). **A copy of this revised document is included in this filing.**
6. Central Hudson Gas & Electric Corporation Transmission Planning Guidelines; Central Hudson Gas & Electric Corporation, March 16, 2016 (filed 2016).
7. Central Hudson Gas & Electric Corporation (CHG&E) Interconnection Requirements Distributed Energy Resources Connected in Parallel with the Central Hudson Electrical Delivery System; Central Hudson Gas & Electric Corporation, December, 2019 (filed 2020).
8. TRANSMISSION PLANNING CRITERIA (TP-7100-18); Consolidated Edison Company of New York, August, 2019 (filed 2020).
9. Management of Merchant and Company Interconnection Projects (TP-7510-10); Consolidated Edison Company of New York, Inc., December, 2018 (filed 2019).

10. Performance Requirements for Inverter-Based Generation (TP-8100-0); Consolidated Edison Company of New York, Inc., August, 2019 (filed 2020).
11. Developer Welcome Kit; Consolidated Edison Company of New York, Inc., January, 2021 (filed 2021). **A copy of this revised document is included in this filing.**
12. STANDARD ENGINEERING DESIGN GUIDELINES FOR AREA SUBSTATIONS, TRANSMISSION SUBSTATIONS AND PURS FACILITIES (CE-ES-2002); Consolidated Edison Company of New York, Inc., March, 2019 (filed 2020).
13. Transmission Planning Criteria; PSEG Long Island, July 1, 2016 (filed 2017). The latest documents are available from the PSEG-Long Island web site at <https://www.psegliny.com/aboutpseglongisland/legalandregulatory>.
14. REQUIREMENTS FOR GENERATING FACILITY INTERCONNECTION TO THE LIPA TRANSMISSION SYSTEM, PSEG Long Island, March 2018 (filed 2018).
15. BULK ELECTRIC SYSTEM FACILITY AND END USER INTERCONNECTION REQUIREMENTS TO THE LIPA TRANSMISSION SYSTEM, PSEG Long Island, April 2017 (filed 2018).
16. Smart Grid Small Generator Interconnection Procedures for New Distributed Generators Less than 10 MW Connected in Parallel with LIPA's Radial Distribution Systems, PSEG Long Island, Revised June 1, 2020 (filed 2021). **A copy of this revised document is included in this filing.**
17. Performance Requirements for Transmission-Connected Resources Using Non-Synchronous Generation, Long Island Power Authority, (filed 2017).
18. Non-Synchronous Generation / HVDC / FACTS Interconnection Projects - Power System Studies for Considerations, PSEG Long Island, March 2018 (filed 2018).
19. Design Criteria for Developer Connection to the New York Power Authority Transmission System, Revision Date: APR 2020; New York Power Authority, April 21, 2020 (filed 2021). **A copy of this revised document is included in this filing.**
20. AVANGRID ELECTRIC TRANSMISSION PLANNING MANUAL - CRITERIA & PROCESSES NYSEG, RG&E, CMP, MEPCO and UI, June, 2019 (filed 2020).
21. Requirements for Independent Power Producers of Electricity (BULLETIN 86-01); New York State Electric & Gas Corporation and Rochester Gas and Electric Corporation, October 3, 2011 (filed 2016).
22. Transmission Planning Guide (TGP28 – Issue 5); National Grid, January 27, 2020 (filed 2020)
23. National Grid Electric System Bulletin No.756: Supplement to Specifications for Electrical Installations, Requirements for Parallel Generation Connected to a National Grid Owned EPS; National Grid, version 2.3, September 2015 (filed 2017).
24. ORANGE AND ROCKLAND UTILITIES, INC. TRANSMISSION DESIGN STANDARDS (Revision 10); Orange and Rockland Utilities, Inc., July 31, 2020 (filed 2021). **A copy of this revised document is included in this filing.**
25. ORU-ENGR-004 - Revision 2: Management of Standard Large and Small Facility Interconnection Projects, Orange & Rockland Utilities, Inc., May 16, 2011 (filed 2015).
26. ORU-ENGR-06A-000 FACILITY INTERCONNECTION INFORMATIONAL KIT; Orange and Rockland Utilities, Inc., January 31, 2020 (filed 2020).
27. ORU-ENGR-008-000 INVERTER-BASED RESOURCES PERFORMANCE REQUIREMENTS; Orange and Rockland Utilities, Inc., February 1, 2020 (filed 2020).
28. New York Transco Guidelines for Third Party Interconnections, March 10, 2021 (filed 2021). **A copy of this revised document is included in this filing.**

29. New York Transco Transmission Planning Criteria, March 11, 2021 (filed 2021). **A copy of this revised document is included in this filing.**

Part 5: Transmission Planning Assessment Practices

This part includes a listing of any new or revised transmission planning assessment practices (“practices”) documents provided with this filing and previously filed practices documents that are still in effect. NYISO and the NYTOs have and use various documents (procedures, guidelines, *etc.*) that define or strongly relate to practices for assessment of the transmission system for planning purposes.

The new, revised, or previously filed practices documents that pertain to this filing are as follows:

1. *NPCC Guidelines for NPCC Area Transmission Reviews*. This document has been incorporated into NPCC Directory #1 as Appendix B (see Part 4, document #3).
2. *NPCC Regional Reliability Reference Criteria A-10 Classification of Bulk Power System Elements*, Northeast Power Coordinating Council, March 27, 2020 (filed 2021). **A copy of this revised document is included in this filing.** The NPCC criteria are available from the NPCC web site at: (<https://www.npcc.org/content/docs/public/program-areas/standards-and-criteria/regional-criteria/criteria/a-10-20200508.pdf>).
3. *New York ISO Comprehensive System Planning Process* (Attachment Y of the NYISO OATT), with the latest effective date of May 1, 2020. This document is available from the NYISO web site at: (<https://www.nyiso.com/regulatory-viewer>).
4. *NYISO Transmission Expansion and Interconnection Manual*; December, 2020 (filed 2021). **A copy of this revised document is included in this filing.**

This manual is available from the NYISO web site at:

(https://www.nyiso.com/documents/20142/2924447/tei_mnl.pdf/).

Note that the *Transmission Expansion and Interconnection Manual* contains the following transmission planning guidelines:

- a. Attachment F: NYISO Transmission Planning Guideline #1-1, Guideline for System Reliability Impact Studies, Version 3.0, June 30, 2017;
 - b. Attachment G: NYISO Transmission Planning Guideline #2-1, Guideline for Voltage Analysis and Determination of Voltage-Based Transfer Limits, Version 3.0, June 30, 2017;
 - c. Attachment H: NYISO Transmission Planning Guideline #3-1, Guideline for Stability Analysis and Determination of Stability-Based Transfer Limits, Version 3.0, June 30, 2017;
 - d. Attachment I: NYISO Transmission Planning Guideline #4-1, NYISO Guideline for Fault Current Assessment, Version 3.0, June 30, 2017;
 - e. Attachment J: NYISO Transmission Planning Guideline #5-0, NYISO Guideline on Application of High-Speed Autoreclosing, Version 3.0, June 30, 2017.
5. *NYISO Reliability Planning Process Manual*; December, 2019 (filed 2020). This document is available from the NYISO website at:

(https://www.nyiso.com/documents/20142/2924447/rpp_mnl.pdf/).

6. NYISO Operations Manuals:

Operations manuals often describe operating rules and procedures that have a bearing on transmission planning studies in that these rules and procedures should be taken into consideration and modeled to the extent possible in performing analyses intended to simulate the operation and performance of the transmission system. For example, rules and procedures in areas such as voltage control and operation of phase angle regulators have significant relevance to transmission planning studies. NYISO operations manuals that have such significant relevance are as follows:

- a. NYISO *Transmission and Dispatching Operation Manual*; December, 2020 (filed 2021). **A copy of this revised document is included in this filing.** This document is available from the NYISO web site at:
[\(https://www.nyiso.com/documents/20142/2923301/trans_disp.pdf/\)](https://www.nyiso.com/documents/20142/2923301/trans_disp.pdf/).
- b. NYISO *Emergency Operations Manual*, October, 2020 (filed 2021). **A copy of this revised document is included in this filing.** This document is available from the NYISO web site at:
[\(https://www.nyiso.com/documents/20142/2923301/em_op_mnl.pdf/\)](https://www.nyiso.com/documents/20142/2923301/em_op_mnl.pdf/).

7. NYISO *Methodology for Determining System Operating Limits for the Planning Horizon*, April 1, 2017 (filed 2017).
8. *Voltage Criteria and Voltage Control on the Bulk Electric System (BES) (TP-7000-23)*; Consolidated Edison Company of New York, Inc., December, 2019 (filed 2020).

Part 6: Evaluation of Transmission System Performance

NYISO conducts studies to evaluate transmission system performance in two general time frames; the operating time frame (nominally out to a year), and the planning time frame (future years). The reports of both types of NYISO studies have been provided in previous FERC-715 filings.

In the operating time frame, NYISO completed two seasonal operating studies since the last FERC-715 filing, the Summer 2020 Operating Study and the Winter 2020-2021 Operating Study. These studies assessed the transfer limits of the New York operating transmission interfaces for conditions expected to occur during the summer 2020 and winter 2020-2021 peak load periods, respectively. **Copies of these study reports are included in this filing** and are available from the NYISO web site at:

(<https://www.nyiso.com/documents/20142/3691300/Summer-2020-Operating-Study-Draft-Final-OC-Approved.pdf>); and

(<https://www.nyiso.com/documents/20142/3691300/Winter2020-21-Operating-Study-Final.pdf>).

In the planning time frame, the NYISO completed a 2020 Comprehensive Area Transmission Review of the planned NYS bulk power transmission system in the study year 2025. As part of the NPCC reliability compliance and enforcement program, each NPCC Area (in this case, New York) is required to conduct an annual assessment of the reliability of its planned bulk power transmission system with respect to the NPCC Directory #1 (see Part 4), in accordance with the *Guidelines for NPCC Area Transmission Reviews* (Directory #1, Appendix B). Under this program, each Area is required to conduct a Comprehensive Review at least once every five years and either an Interim or Intermediate Review in the intervening years. **A copy of the draft NYISO 2020 Comprehensive Area Transmission Review Report is included in this filing.**

In 2019, the NYISO established a new Short-Term Reliability Process (“STRP”) with its requirements prescribed in Attachments Y and FF of the NYISO’s Open Access Transmission Tariff. The STRP evaluates the first five years of the planning horizon, with a focus on needs arising in the first three years of the planning horizon. The first step in the STRP is the Short-Term Assessment of Reliability (“STAR”). STARS are performed quarterly to proactively address reliability needs that may arise within five years (“Short-Term Reliability Needs”)³ due to various changes to the grid such as generator deactivations, revised transmission plans, and updated load forecasts. Transmission Owners also assess the impact of generator deactivations on their local system. A Short-Term Reliability Need that is observed within the first three years of the study period is deemed a “Near-Term Reliability Need.”⁴ Should a Near-Term Reliability Need

³ OATT Section 38.1 contains the tariff definition of a Short-Term Reliability Process Need.

⁴ OATT Section 38.1 contains the tariff definition of a Near-Term Reliability Need. *See also*, OATT Section 38.3.6, which

be identified in a STAR, the NYISO solicits and selects the solution to address the need. If a need arises on bulk power transmission facilities beyond the first three years of the study period, the NYISO may choose to address the need within the STRP or, if time permits, through the long-term Reliability Planning Process that considers needs and solutions in years four through ten of the study period.

Since the 2020 FERC 715 filing, the NYISO has completed two STARs. **Copies of these study reports are included in this filing** and are available from the NYISO website at:

(<https://www.nyiso.com/documents/20142/16004172/2020-Q3-STAR-Report-vFinal.pdf/>); and

<https://www.nyiso.com/documents/20142/16004172/2020-Q4-STAR-Report-vFinal-v2.pdf>).

Also in the planning timeframe, NYISO performs the Reliability Needs Assessment (“RNA”) and develops a Comprehensive Reliability Plan (“CRP”) on a biennial basis. Under this process, NYISO first evaluates and identifies the reliability needs of the NYS bulk power transmission facilities over a ten-year period, then solicits solutions and develops a plan for addressing any identified reliability needs. NYISO considers market-based and, if necessary, regulated solutions to reliability needs. NYISO considers all types of solutions, including generation, transmission, demand-side solutions, operating procedure changes, or any combination of these solution types when evaluating the potential solutions which are assessed in the CRP. **A copy of the NYISO 2020 RNA report is included in this filing.** The report is also available from the NYISO web site at:

(<https://www.nyiso.com/documents/20142/2248793/2020-RNAReport-Nov2020.pdf/>).

Appendix A: Requesting NYISO FERC 715 Information

The NYISO 2021 “Annual Transmission Planning and Evaluation Report” and various documents included or referenced in the report and not considered to be CEII are available from the NYISO public web site at:

<https://www.nyiso.com/ny-power-system-information-outlook>

In order to obtain the information designated herein as CEII, a requestor must complete a NYISO CEII Request Form, instructions for which are available from the NYISO public web site at:

<https://nyiso.tfaforms.net/187>