

AC Transmission Public Policy Transmission Projects

Yachi Lin

Senior Manager, Transmission Planning

NYSRC Executive Committee

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Topics

- Public Policy Transmission Planning Process
- AC Transmission Public Policy Transmission Needs and the Selected Projects
- Projected System Impacts from the Selected AC Transmission Projects

Public Policy Transmission Planning Process

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Overview

- Section 31.4 of Attachment Y of the NYISO Open Access Transmission Tariff (OATT) describes the planning process that the NYISO, and all interested parties, shall follow to consider needs for new transmission projects on the Bulk Power Transmission Facilities (BPTF) that are driven by Public Policy Requirements.
- A Public Policy Requirement is a federal or New York State statute or regulation, including a New York State Public Service Commission (PSC) order adopting a rule or regulation subject to and in accordance with the State Administrative Procedure Act, any successor statute, or any duly enacted law or regulation passed by a local governmental entity in New York State, that may relate to transmission planning on the BPTF.

Public Policy Planning Process

■ Phase I: Identify Needs and Assess Solutions

- NYISO solicits transmission needs driven by Public Policy Requirements
- PSC identifies transmission needs and defines additional evaluation criteria
- NYISO solicits solutions (transmission, generation, or EE/DR)
- NYISO performs Viability and Sufficiency Assessment (VSA)
- PSC reviews assessment and confirms continued transmission need

■ Phase II: Transmission Evaluation and Selection

- NYISO staff evaluates viable and sufficient transmission solutions and recommends the more efficient or cost-effective solution
- Stakeholder review and advisory votes at BIC and MC
- NYISO Board may select a transmission solution for purposes of cost allocation and recovery under the NYISO OATT

AC Transmission Public Policy Transmission Needs and the Selected Projects

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AC Transmission PPTN

- The PSC issued an order identifying the AC Transmission Public Policy Transmission Needs on December 17, 2015
- Segment A (Central East): at least 350 MW of additional transfer capability
 - New Edic/Marcy to New Scotland 345 kV line
 - Decommission Porter to Rotterdam 230 kV lines
 - 345 or 230 kV connection to Rotterdam
- Segment B (UPNY/SENY): at least 900 MW of additional transfer capability
 - New Knickerbocker to Pleasant Valley 345 kV line
 - Rock Tavern and Coopers Corners 345 kV substation terminal upgrades
 - Shoemaker – Sugarloaf upgrades
- See PSC Order for full description



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Proposed projects

Developer	Project Name	Project ID	Category	Type	Location (County/State)
National Grid/Transco	New York Energy Solution Segment A	T018	PPTP	AC	Segment A
National Grid/Transco	New York Energy Solution Segment B	T019	PPTP	AC	Segment B
NextEra Energy Transmission New York	Enterprise Line: Segment A	T021	PPTP	AC	Segment A
NextEra Energy Transmission New York	Enterprise Line: Segment B	T022	PPTP	AC	Segment B
NextEra Energy Transmission New York	Enterprise Line: Segment B-Alt	T023	PPTP	AC	Segment B
North America Transmission / NYPA	Segment A + 765 kV	T025	PPTP	AC	Segment A
North America Transmission / NYPA	Segment A Base	T026	PPTP	AC	Segment A
North America Transmission / NYPA	Segment A Double Circuit	T027	PPTP	AC	Segment A
North America Transmission / NYPA	Segment A Enhanced	T028	PPTP	AC	Segment A
North America Transmission / NYPA	Segment B Base	T029	PPTP	AC	Segment B
North America Transmission / NYPA	Segment B Enhanced	T030	PPTP	AC	Segment B
ITC New York Development	16NYPP1-1A AC Transmission	T031	PPTP	AC	Segment A
ITC New York Development	16NYPP1-1B AC Transmission	T032	PPTP	AC	Segment B
AvanGrid	Connect New York Recommended	T033	PPTP	HVDC	Segments A and B
AvanGrid	Connect New York Alternative	T034	PPTP	HVDC	Segments A and B
GlidePath	Distributed Generation Portfolio	OPP004	OPPP	Gen	Orange, Ulster, Putnam, Greene, NY
PPTP = Public Policy Transmission Project OPPP = Other Public Policy Project		Gen = Generation AC = Alternating Current Transmission HVDC = High-Voltage Direct Current Transmission			



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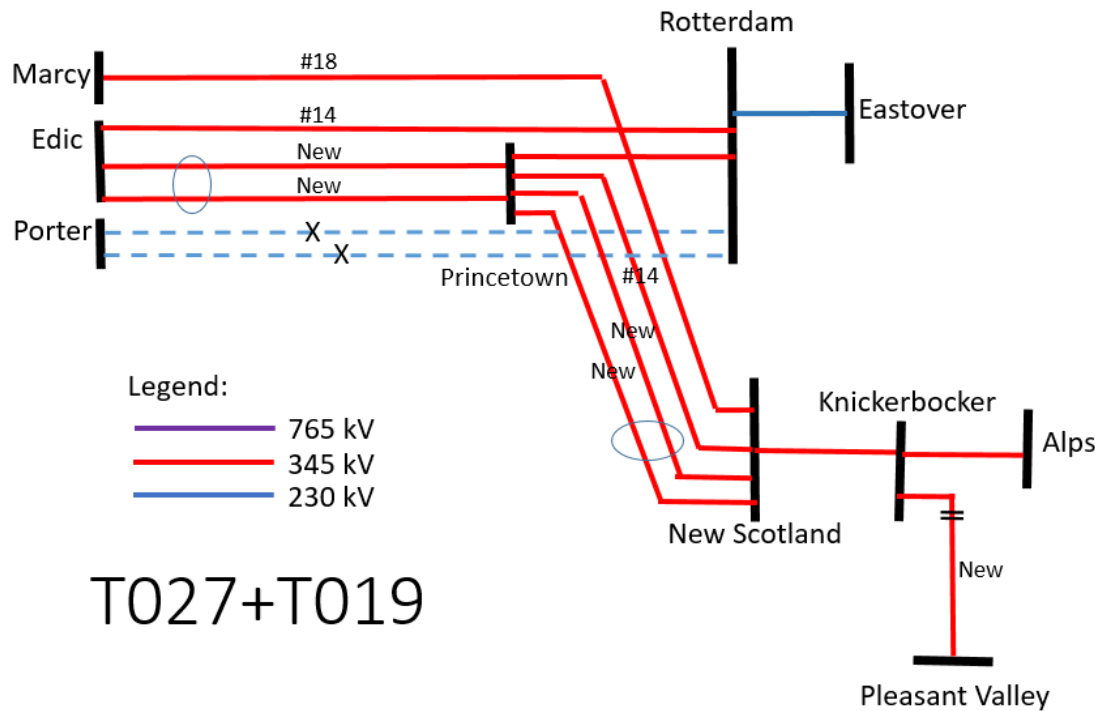
NYISO Board of Directors' Decision

- Approved the revised AC Transmission Report and its recommendations for project rankings and selections on April 8, 2019
- Selected the Double-Circuit Segment A project (T027) proposed jointly by North America Transmission (“NAT”) and the New York Power Authority (“NYPA”) as the more efficient or cost-effective transmission solution to address Segment A of the AC Transmission Needs
- Selected the New York Energy Solution Segment B project (T019) proposed jointly by Niagara Mohawk Power Corporation d/b/a National Grid (“National Grid”) and the New York Transco, LLC (“Transco”) as the more efficient or cost-effective transmission solution to address Segment B of the AC Transmission Needs
- The estimated cost of the combined projects including a 30% contingency is \$1,230 million. The developers of the selected projects may recover their project costs through the NYISO’s OATT in rates accepted by the Federal Energy Regulatory Commission (“FERC” or “Commission”).

Documentation

- **Documents are posted on the NYISO website:**
 - The Board's decision on approval of AC Transmission PPTP and selection of Public Policy Transmission Projects
 - The AC Transmission Public Policy Transmission Plan
 - The AC Transmission Public Policy Transmission Planning Report Appendices

Simplified Diagram of the Selected Projects: T027 (Segment A) + T019 (Segment B)



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T027: NAT/NYPA - Segment A Double-Circuit

- A new 345 kV double circuit line of approximately 86 miles from the existing Edic 345 kV substation to the existing New Scotland 345 kV substation
- Two new 345 kV lines of approximately five miles looping the existing 345 kV Edic to New Scotland #14 line into and out of a new Rotterdam 345 kV Substation. The Rotterdam 230 kV substation will be retired
- Two new 345/115 kV lower impedance transformers connecting the existing Rotterdam 115 kV switchyard to the new 345 kV switchyard. One new 345/230 kV transformer connecting the existing 230 kV Rotterdam to Eastover Road #38 line to the new Rotterdam 345 kV switchyard
- Rebuild approximately six miles of the Rotterdam to New Scotland 345 kV transmission line to accommodate the new double-circuit line beginning from Princetown junction
- Remove the Rotterdam to New Scotland 115 kV transmission line
- A new Princetown 345 kV switchyard by tapping the newly proposed Edic-New Scotland lines and Rotterdam-New Scotland transmission lines
- Terminal upgrades at Edic and Marcy 345 kV substations
- Decommission of the Porter to Rotterdam 230 kV lines #30 and #31

T019: National Grid/Transco - NYES Segment B

- A new double-circuit 345/115 kV line from a new Knickerbocker 345 kV switching station to the existing Pleasant Valley substation, and 50% series compensation on Knickerbocker to Pleasant Valley 345 kV line;
- Two new 135 MVAR capacitor banks at the Pleasant Valley 345 kV substation;
- Terminal upgrades at Roseton 345 kV substation to increase the thermal ratings on the 345 kV Roseton to East Fishkill #305 line;
- Terminal upgrades to the existing New Scotland 345 kV substation to upgrade the thermal ratings on the 345 kV New Scotland to Knickerbocker #2A line;
- Retirement of aging infrastructure including multiple existing 115 kV lines between Greenbush 115 kV substation and Pleasant Valley 115 kV substation.

Segment B Projects

- **Per the PSC order, all Segment B projects include:**
 - Rock Tavern and Coopers Corners 345 kV substation terminal upgrades to be performed by Central Hudson
 - Shoemaker – Sugarloaf upgrades to be performed by Orange & Rockland

Projected System Impacts of the Selected Projects

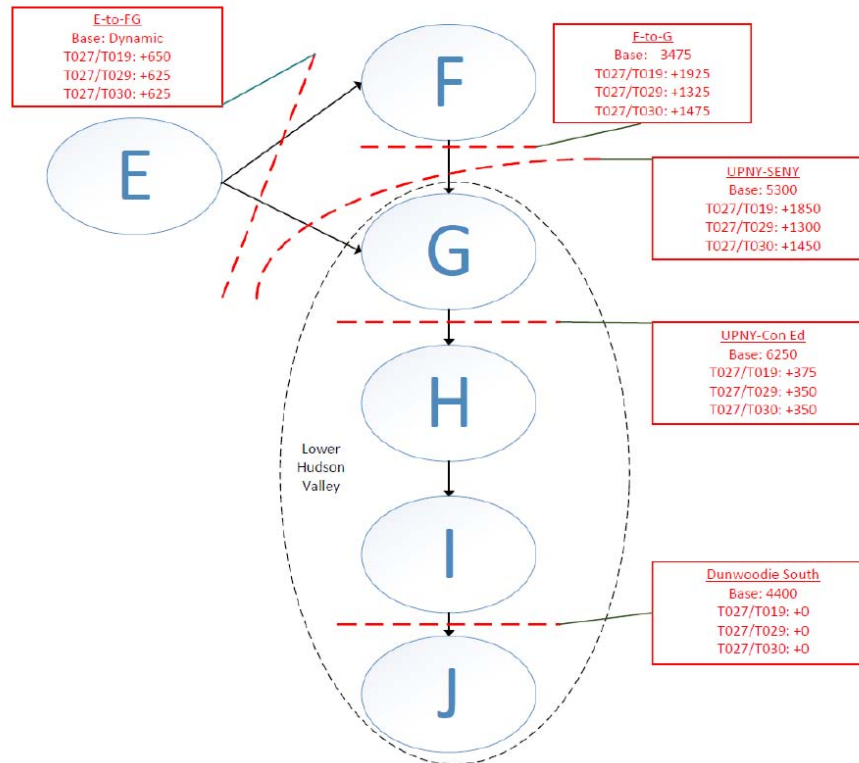
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Projected Impact to Transfer Limits

- Central East voltage transfer limit: increase of 875 MW
- Emergency Transfer limit across UPNY-SENY: increase of 1,850 MW (more details in the next slide)
- Normal Transfer limit across UPNY-SENY: increase of 2,100 MW for all facilities in-service, and increase of 1,275 MW under certain outage conditions

Transfer Limits: Emergency Transfer Criteria



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Transfer Limits:

UPNY/SENY Normal Transfer Criteria

Project/ Maintenance outage	No Outage	CPV - Rock Tavern 345 kV Line	Marcy - Coopers Corners 345 kV Line	Roseton - East Fishkill 345 kV Line	Athens- Pleasant Valley 345 kV Line	Knickerbock er-Pleasant Valley 345 kV Line
Pre-Project	5,050	4,450	4,425	3,975	3,450	-
T027+T019	7,150	6,600	6,475	5,375	4,875	4,725

Summary of Additional Benefits

- Reducing persistent congestion
- Enabling the delivery of environmentally desirable power from upstate to downstate New York
- Enhancing system reliability by increasing transfer capability, operational flexibility, outage scheduling flexibility, and resilience to extreme weather events
- Replacing of aging infrastructure through the use of existing Rights of Way

Summary of Identified Impacts

- **Potential subsynchronous resonance (SSR) issue due to the series capacitor proposed in T019.**
 - Potential mitigation measures were evaluated by ABB as part of public policy study.
 - The impact will be further studied in the Facilities Study and Network Upgrade Facilities will be identified as necessary to mitigate SSR.
- **Degradation of NY-New England transfer limit**
 - Will be restored via Network Upgrade Facilities
 - SIS preliminarily identified upgrade options, including the addition of a PAR on the Alps-Berkshire tie line.
 - The solution and design will be finalized in the Facilities Study
- **Projected to increase operating reserve requirement for SENY**
 - The analysis demonstrates that every Segment B project would result in some level of increase in the SENY reserve requirement, but the National Grid/Transco T019 project would require approximately 475 MW of additional 30-minute reserves compared to other Segment B projects.
 - The New York Control Area total 30 minute reserve requirement of 2,620 MW would not change as a result of the transmission projects. Given that reserve suppliers located in SENY typically provide the majority of the New York Control Area reserve requirement of 2,620 MW, the 475 MW increase in SENY locational reserve requirement associated with the T019 project is not expected to be impactful.



In-Service Date

- **Based on the estimated project schedules, the in-service date established for the purposes of the Development Agreements for the selected Segment A and Segment B projects is December 2023.**

Next Step: Development Agreement

- **The NYISO and the selected Developers will negotiate and execute Development Agreements, through which Developers commit to obtain permits, construct, and bring them into service by the in-service date, according to a milestone schedule.**

Next Step: Facilities Study

- Selected Segment A and Segment B projects will be studied together.
- More detailed studies, including Subsynchronous Resonance and Transient Recovery Voltage, will be performed.
- Network Upgrade Facilities will be finalized to mitigate identified issues.

Questions?

We are here to help. Let us know if we can add anything.

The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits 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 policy makers, stakeholders and investors in the power system



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