

# **NYISO BOARD OF DIRECTORS' DECISION**

ON

## **APPROVAL OF AC TRANSMISSION PUBLIC POLICY TRANSMISSION PLANNING REPORT AND SELECTION OF PUBLIC POLICY TRANSMISSION PROJECTS**

**APRIL 8, 2019**

### **EXECUTIVE SUMMARY**

Today we select two transmission projects that will benefit New York State's electric consumers by enabling the delivery of environmentally desirable power required to meet state energy goals, relieving uneconomic congestion, and replacing aging infrastructure while enhancing New York State's already high standard of system reliability. Our action constitutes one of the most significant decisions by the Board of Directors ("Board") in the nearly twenty-year history of the New York Independent System Operator, Inc. ("NYISO").

We are making these selections in accordance with the requirements of the NYISO's Public Policy Transmission Planning Process ("Public Policy Process") located in Attachment Y of the NYISO's Open Access Transmission Tariff ("OATT"). Pursuant to this process, the NYISO is responsible for selecting the more efficient or cost-effective transmission solution from among competing projects to address a transmission need driven by a public policy requirement ("Public Policy Transmission Need") identified by the New York Public Service Commission ("NYPSC").

There have been no large-scale, high-voltage, alternating current ("AC") transmission facilities constructed in New York State in over thirty years. This has resulted in an aging and congested transmission infrastructure that cannot adequately accommodate the state's future energy goals, including the requirement that 50% of the state's load be served by renewable resources by 2030 and the additional goals currently being discussed in connection with New York State's Green New Deal. Both New York State and the NYPSC identified the need to expand the state's AC transmission capability to deliver additional power from generating facilities located in upstate New York, including important renewable resources, to the population centers located downstate. As part of the NYISO's initial Public Policy Process, the NYPSC identified the Public Policy Transmission Needs to increase Central East transfer capability by at least 350 MW ("Segment A") and UPNY/SENY transfer capability by at least 900 MW ("Segment B") to provide additional capability to move power from upstate to downstate New York (together, the "AC Transmission Needs").

NYISO staff solicited solutions to the AC Transmission Needs and received a number of well-developed, high-quality proposals. NYISO staff and its consultants performed detailed studies and analyses to determine which solutions were viable and sufficient to meet the identified needs and then evaluated their performance across a wide range of quantitative and qualitative metrics established in the OATT. NYISO staff detailed the results of their analyses and their

recommendations for project ranking and selection in a Public Policy Transmission Planning Report for the AC Transmission Needs (“AC Transmission Report”).

NYISO stakeholders and developers were provided numerous opportunities to review and provide input to NYISO staff and the Board concerning the AC Transmission Report and its conclusions. In addition, the NYISO’s Market Monitoring Unit (“MMU”) reviewed the projects recommended for selection to identify their impact on the NYISO-administered markets. The Board reviewed all of this input and performed its own independent review of the AC Transmission Report. The Board directed that NYISO staff perform certain additional studies and analyses and update the report and the recommendations for project ranking and selection accordingly. The modifications to the report were then subject to further review and comment by stakeholders, developers, and the MMU.

The Board arrived at its decision only after detailed review and deliberation concerning the AC Transmission Report, stakeholders’ and developers’ comments, and the analysis of the market impacts provided by the MMU. The OATT establishes the metrics that the NYISO considers in ranking projects and selecting the more efficient or cost-effective transmission solutions, but does not establish a specific formula or weighting of the metrics. Rather, we must use our independent judgment, informed by all the input we received, to evaluate the totality of each project’s performance across all of the selection metrics. The Board carefully considered hundreds of pages of data, studies, and comments to determine the more efficient or cost-effective solutions for New York.

For the reasons outlined below, we approve the revised AC Transmission Report and its recommendations for project rankings and selections. Specifically, we select the Double-Circuit 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. We also select the New York Energy Solution 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 anticipated in-service date for Projects T027 and T019 is December 2023. 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”).

## **BACKGROUND**

### *AC Transmission Needs*

The NYISO Public Policy Process was accepted by the Commission in accordance with Order No. 1000 as the means to address Public Policy Transmission Needs in New York. The AC Transmission Needs identified by the NYPSC drew upon extensive analysis performed by the NYISO and others concerning the benefits of expanding transmission capability to move power from upstate to downstate New York, including addressing persistent congestion, enabling the

delivery of environmentally desirable power, enhancing system reliability, and replacing aging infrastructure.

In 2008, the NYISO and the New York Transmission Owners jointly began the State Transmission Assessment and Reliability Study (“STARS”) to address aging transmission and generation infrastructure in New York and to identify cost-effective incremental transmission upgrades. The STARS findings informed Governor Andrew Cuomo’s 2012 Energy Highway Blueprint, which called for the development of over 1,000 MW of new AC transmission upgrades to move power from upstate to downstate. As a result, in November 2012, the NYPSC initiated the “Examine Alternating Current Transmission Upgrades” proceeding, which highlighted the need to relieve congestion and replace aging infrastructure. In a series of NYPSC orders and technical conferences over the subsequent years, the NYPSC sought and evaluated, with the NYISO’s assistance, proposals from transmission owners and other developers to increase transmission transfer capability.

On August 1, 2014, the NYISO commenced its first Public Policy Process cycle. The NYISO solicited and submitted to the NYPSC potential transmission needs. On December 17, 2015, the NYPSC issued an order identifying the AC Transmission Needs to provide additional transmission capacity to move power from upstate to downstate New York, which the NYPSC determined would produce a number of valuable benefits for New York. The NYPSC also requested that certain developers participating in its AC transmission proceeding submit their project proposals for consideration by the NYISO in the Public Policy Process.

#### *NYISO Evaluation of Proposed Solutions and Draft AC Transmission Report*

On February 29, 2016, the NYISO issued a solicitation for solutions to the AC Transmission Needs. Developers submitted sixteen projects. Of these, the NYISO determined that seven Segment A proposals and six Segment B proposals were viable and sufficient to address the AC Transmission Needs. On October 27, 2016, the NYISO issued the AC Transmission Viability and Sufficiency Assessment and filed it with the NYPSC for its consideration and action. On January 24, 2017, the NYPSC issued an order confirming the AC Transmission Needs and determining that the NYISO should evaluate and select transmission solutions.

NYISO staff, in coordination with its independent consultant, Substation Engineering Company (“SECO”), conducted a detailed evaluation and ranked each project based on its performance across the metrics established in Section 31.4.8.1 of the OATT. These quantitative and qualitative metrics include the project’s capital cost, cost per MW, expandability, operability, performance, property rights and routing, schedule, metrics identified by the NYPSC (*e.g.*, replacement of aging infrastructure), and other metrics (*e.g.*, production cost savings, Location-Based Marginal Pricing (“LBMP”) savings, Installed Capacity (“ICAP”) savings, and emissions savings). NYISO staff used a number of scenarios and sensitivities to evaluate the proposed projects’ performance across these metrics.

NYISO staff developed a draft AC Transmission Report that detailed the results of its analysis and proposed ranking of the projects. The draft report recommended selection of NAT/NYPA’s Segment A Project T027 and their Segment B Project T029 as the more efficient or

cost-effective transmission solutions. The report was reviewed with developers and then with stakeholders and developers in a series of joint Electric System Planning Working Group (“ESPWG”) and Transmission Planning Advisory Subcommittee (“TPAS”) meetings. The report was revised and clarified based on stakeholder and developer feedback. In addition, the MMU reviewed and evaluated the impact of the proposed projects on the NYISO-administered markets. The Business Issues Committee and Management Committee subsequently reviewed and recommended Board approval of the draft AC Transmission Report by affirmative advisory votes of 76.33% and 80.0%, respectively. Pursuant to Section 31.4.11.2 of the OATT, NYISO staff then submitted the draft AC Transmission Report to the Board on June 19, 2018, for its review and action.

### *Board Review and Revisions to Draft AC Transmission Report*

The Board exercised its discretion under the ISO Agreement<sup>1</sup> to provide interested parties with the opportunity to submit comments and to make oral presentations for the Board’s consideration prior to its taking action on the draft AC Transmission Report.<sup>2</sup> Based on the input received and the Board’s independent review of the report, the Board directed NYISO staff to conduct certain additional studies and analyses. The Board then concluded that certain modifications should be made to the draft report.

The Board agreed with the draft AC Transmission Report recommendation that NAT/NYPA’s Project T027 is the more efficient or cost-effective transmission solution for Segment A.<sup>3</sup> However, based on the additional studies and analyses, the Board concluded that the more efficient or cost-effective transmission solution for Segment B is National Grid/Transco’s Project T019, rather than NAT/NYPA’s Project T029.<sup>4</sup> The Board determined that Project T019 demonstrated superior performance across a broader range of metrics when compared to Project T029 and the other proposed Segment B projects, including, significantly, providing additional transfer capability across the UPNY/SENY transmission interface.<sup>5</sup>

Accordingly, the Board directed NYISO staff to revise the draft AC Transmission Report, including the project rankings and recommended selections. The modifications were reflected in an Addendum contained in the revised AC Transmission Report. As required by the OATT, the Board directed that the draft report be returned to the Management Committee for further

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<sup>1</sup> ISO Agreement Section 5.07 (“The ISO Board also may review any matter, complaint, or Committee action on its own motion.”)

<sup>2</sup> At its July 2018 meeting, the Board heard oral presentations concerning the draft AC Transmission Report by NAT/NYPA, National Grid/Transco, and NextEra. National Grid/Transco also provided additional written comments at the oral presentation.

<sup>3</sup> Project T027 includes a new 86-mile double-circuit line between the Edic and New Scotland 345 kV substations and the addition of a new Princetown 345 kV switchyard to connect to Rotterdam. The double-circuit line will use rights-of-way currently occupied by the Porter-Rotterdam 230 kV lines that will be decommissioned as part of the project.

<sup>4</sup> Project T019 includes, among other things, a new double-circuit 345/115 kV line from a new Knickerbocker 345 kV switching station to the existing Pleasant Valley Substation, including a rebuild of the Churchtown 115 kV switching station, an upgrade of the existing Pleasant Valley 345/115 kV Substation, and 50% series compensation on Knickerbocker to Pleasant Valley 345 kV line.

<sup>5</sup> The Board described its proposed modifications in its December 27, 2018, Summary of Proposed Modifications to Draft AC Transmission Public Policy Transmission Planning Report and Proposed Selections.

comments.<sup>6</sup> The Board is required to consider the Management Committee comments, including comments regarding the MMU's evaluation, prior to making a final determination concerning a revised report.

#### *Additional Review and Input by Developers, Stakeholders, and MMU*

Before providing the revised AC Transmission Report to the Management Committee, NYISO staff presented the revised report at two joint ESPWG/TPAS meetings to provide additional opportunities for stakeholders and developers to review and comment on the modifications. Following the initial stakeholder review of the revised draft report, the NYISO was informed of an impedance modeling error included in the NAT/NYPA and National Grid/Transco Segment B proposals that affected the calculated transfer capability of those projects. NAT/NYPA and National Grid/Transco each subsequently provided corrected data for their projects. The NYISO staff assessed the impact of the corrected impedance data on the transfer limit calculations and other affected metrics and then further revised the report to reflect the findings.

In addition, NYISO staff provided the revised draft report to the MMU to update its evaluation of the impact of the recommended projects on the NYISO-administered markets. The MMU concluded that, under a scenario that did not take into account state policy initiatives, the recommended projects would have a benefit-cost ratio of 0.74. However, with renewable resources such as wind and solar added upstate to meet the state Clean Energy Standard and expected generator retirements, the recommended projects would have a benefit-cost ratio well in excess of 1.0. The MMU also recognized that its assessment does not take account of certain unquantifiable benefits that would result from the projects.

At the February 27, 2019, Management Committee meeting, NYISO staff reviewed the revised AC Transmission Report with stakeholders and developers, and the MMU reviewed its evaluation of the report. Stakeholders and developers were permitted to provide comments on the revised draft report at the ESPWG/TPAS meetings and to provide comments to the Management Committee. These comments were submitted to the Board and publicly posted on the NYISO's website.<sup>7</sup> In addition, NAT/NYPA and National Grid/Transco made oral presentations concerning the revised draft report to the Board on March 18, 2019. NYISO staff and the Board reviewed and carefully considered this input.

### **BOARD DECISION**

We appreciate the significant work that developers dedicated to developing and proposing their projects. The Board's extensive deliberations in this Public Policy Process reflect the quality of the proposals and the involvement of all of the developers in the stakeholder and Board processes. We also acknowledge the hard work performed by NYISO staff in administering the Public Policy Process for the AC Transmission Needs and the participation of the other stakeholders, the MMU, and the NYPSC, including the extensive time and resources they have dedicated and the valuable feedback they have provided.

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<sup>6</sup> OATT Section 31.4.11.2.

<sup>7</sup> <https://www.nyiso.com/management-committee-mc-?meetingDate=2019-02-27>

### *Board Responsibilities*

The Board is responsible in the Public Policy Process for reviewing and taking action on a Public Policy Transmission Planning Report, including the rankings of the proposed transmission solutions and the selection of the more efficient or cost-effective transmission solution to address a Public Policy Transmission Need.

The OATT does not establish a specific formula or weighting of metrics for the NYISO to identify the more efficient or cost-effective transmission project. It is important to understand that the NYISO's selection metrics may not equate to the least cost solution. Rather, the NYISO carefully assesses and ranks each proposed project's total performance across all of the numerous qualitative and quantitative metrics contained in the tariff using a range of scenarios and sensitivities. The NYISO then solicits and considers input from developers, stakeholders, and other interested parties concerning its analysis and recommendations and presents the results in the Public Policy Transmission Planning Report.

The Board then exercises its independent judgment in evaluating the report. The Board may approve the report or propose modifications, including determining not to select a project if warranted. If the Board modifies the report, it must review the Management Committee's comments concerning the modifications prior to making a final determination concerning the revised draft report.

### *Board Approval of AC Transmission Report, Project Ranking, and Project Selection*

Based upon our review, consideration, and extensive deliberations concerning the AC Transmission Report, stakeholders' and developers' comments, and the MMU's market impact analysis, we approve the AC Transmission Report, its project rankings, and the selection of NAT/NYPA's Project T027 for Segment A and National Grid/Transco's Project T019 for Segment B. The developers of the selected projects may recover their project costs through the NYISO's OATT in rates accepted by FERC.

We agree with the conclusion of the AC Transmission Report that NAT/NYPA's Project T027 and National Grid/Transco's Project T019 are the more efficient or cost-effective transmission solutions to address the Segment A and Segment B AC Transmission Needs, respectively, based on their total performance across the various selection metrics.

Although Project T027 has higher costs relative to some other Segment A projects, it replaces the greatest amount of aging infrastructure among the Segment A projects and provides the highest Central East interface transfer capability among all of the 345 kV Segment A projects. Considering the proposed infrastructure replacements, Project T027 will not only add more efficient and cost-effective new transmission facilities, but will also obviate the need to incur a significant amount of transmission refurbishment costs. Additional benefits provided by Project T027's double-circuit 345 kV design include increased production cost savings, excellent operability and expandability, and a lower electromagnetic field compliance risk due to the double-circuit design.

Project T019 also has higher costs relative to certain Segment B projects, but demonstrates superior performance across a broad range of metrics. Importantly, Project T019 provides for additional transfer capability across the UPNY/SENY transfer interface, the primary objective of the transmission need. Project T019's greater transfer capability results in the lowest cost per MW ratio, highest production cost savings, greatest CO<sub>2</sub> reductions, and highest Installed Capacity savings of the Segment B projects. In addition, the series compensation component of the project provides performance benefits through greater operational flexibility and increased use of the UPNY/SENY interface. The project also has the most resilient foundation and structure design, resulting in significant benefits to the operability of the transmission system during extreme weather events.

Finally, the Board has concluded that selecting Projects T027 and T019 would not have an adverse impact on the competitiveness of the NYISO-administered markets. Rather, the addition of the selected transmission facilities will reduce persistent uneconomic transmission congestion and enhance wholesale market competition by providing additional infrastructure to permit resources located upstate to compete to fulfill customer needs in the NYISO-administered markets.

#### *Assessment of Comments on AC Transmission Report*

NAT/NYPA argue that we should instead select their Project T029 for Segment B. They assert that the combination of Projects T027+T029 is superior to Projects T027+T019 based on their assessment of certain quantitative measures, such as production cost savings and capacity savings, compared against the project cost estimates. We disagree. For the reasons discussed in the AC Transmission Report, Project T019 demonstrates superior performance across the range of both quantitative and qualitative metrics, including project transfer capability, operability, and total performance.

NAT/NYPA argue that Project T019 has a higher cost and has a greater risk of cost increases than Project T029. While cost is an important factor, neither FERC's Order No. 1000 nor the NYISO OATT require cost to be the overriding factor in determining the more efficient or cost-effective transmission solution. In this case, as detailed above, Project T019 does have higher estimated cost relative to certain Segment B projects, but it demonstrates superior performance across a broad range of metrics that warrants the project cost.

In addition, the NYISO accounted for the potential cost increase risks identified by NAT/NYPA in its evaluation of Project T019. The potential for subsynchronous resonance issues resulting from Project T019's use of series compensation will be addressed in the NYISO's interconnection process. The NYISO was not required to complete the interconnection studies prior to selection, but did give due consideration to the interconnection information available at the time of selection. The NYISO also performed additional analysis to evaluate the potential need for and cost of upgrades or mitigation measures related to Project T019's series compensation. This analysis indicated that the magnitude of any upgrades or mitigation measures that might be required would be well within the project's 30% cost contingency.

All Segment B projects will result in degradation of New York-to-New England transfers, so the cost estimates for all of the projects included a cost of \$30M to address any network upgrade

facilities that may be required. Issues concerning the visual impacts of the number and height of structures are most properly addressed in the NYPSC siting process. Finally, based on NYISO staff's and the MMU's review, the 475 MW increase in the SENY locational 30-minute reserve requirement associated with Project T019 is not expected to be impactful.

NAT/NYPA also assert that the NYISO inaccurately determined that Project T019 provides greater production cost savings because it did not model upgrades for terminal equipment for NAT/NYPA's Projects T029 and T030. Again, we disagree. The NYISO correctly modeled NAT/NYPA's projects. Unlike Project T019, the NAT/NYPA proposals did not specify terminal upgrades, and the data they provided clearly indicated the use of original ratings limited by terminal equipment.

NAT/NYPA argue that the production cost savings are mainly driven by the increase on Central East transfer capability provided by the Segment A project. However, it was necessary to evaluate the combined production cost benefits of both the Segment A and Segment B projects. The NYPSC's need determination contemplated that the AC Transmission Needs should only be addressed if both Segments A and B are built.<sup>8</sup> The congestion benefits provided by Segment A to Central East would be diminished if Segment B did not alleviate the downstream constraints associated with the UPNY/SENY interface.

We also reject NAT/NYPA's arguments concerning ICAP cost savings. Project T019 will provide 400 to 500 MW of greater transfer capability compared to the other Segment B projects. Accordingly, ICAP cost savings from Project T019 are greater than the other Segment B projects as demonstrated by the separate and distinct calculation methodologies employed by the NYISO and the MMU. NAT/NYPA's assertion that the NYISO should have re-run the ICAP cost savings calculation to correct for the impedance data error is unpersuasive because, while it is difficult to predict the precise amount of these future benefits, Project T019 would have relatively higher savings than the other Segment B projects in all cases due to Project T019's higher transfer capability.

Further, we do not agree with NAT/NYPA's argument that the NYISO acted inconsistent with its past practice in considering certain resilience benefits or that the resilience benefits for Project T019 are not substantiated. The NYISO appropriately considered resilience as a feature of Operability. Furthermore, the NYPSC's December 17, 2015, order establishing the AC Transmission Needs identified enhancing resilience/storm hardening as one of the benefits driving the transmission need. NAT/NYPA's comparison to the Western New York Public Policy Transmission Need and the wooden poles associated with the selected Empire State Line project is inapt because the NYPSC did not identify such benefits for the Western New York need. In addition, the NYISO reasonably concluded, with input from SECO, that Project T019 would provide greater resilience benefits than Project T029. Directly embedded pole foundations, such as those used by NAT/NYPA's Project T029, may be designed to withstand similar loads as drilled shaft concrete foundations, such as those used by Project T019. However, the NYISO staff and consultants reasonably determined that Project T019 provided the greater combined resilience benefits of heavy duty structures, drilled shaft concrete foundations, and a greater number of dead-

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<sup>8</sup> NYPSC Case No. 12-T-0502, *et al.*, *Order Finding Transmission Needs Driven by Public Policy Requirements* (December 17, 2015), Appendix B, at 2, Evaluation Criteria 8 and 9.



end structures. Furthermore, both Projects T019 and T029 include a longitudinal broken wire to be applied to the load cases. While Project T029 is designed to a slightly higher extreme wind case, the NYISO reasonably concluded that the higher ice loading combined with appropriate wind loading proposed by Project T019 would provide greater benefit.

NAT/NYPA argue that Project T019's series compensation level of 50% is not optimized for future system conditions. The NYISO staff and consultants, however, acted appropriately in performing their evaluation based on what developers proposed, rather than attempting to determine the optimized sizing for series compensation. NAT/NYPA also assert that series compensation can be added in the future to their Projects T029 and T030 to increase the transfer limits if needed. The NYISO, however, correctly assessed Projects T029 and T030 as proposed by NAT/NYPA, which did not include series compensation. The NYISO did consider the expandability of all proposed projects and determined that the proposed design of all three projects (*i.e.*, T019, T029 and T030) provides sufficient space at the Knickerbocker substation for future expansion, which could include series compensation or other facilities not yet considered.

NAT/NYPA also assert that some scenarios (*e.g.*, social cost of carbon) are inconsistent with other scenarios and should not be considered. In addition, several stakeholders, including the Independent Power Producers of New York, the City of New York, Multiple Intervenors, and NAT/NYPA question the NYISO's use of a "G-J Locality Elimination" sensitivity, arguing that it should not be considered as it is flawed and based on unreasonable assumptions. We do not agree. The NYISO's tariff permits it to evaluate the proposed Public Policy Transmission Projects under various system conditions, scenarios, and sensitivities. With regard to the G-J Locality Elimination scenario, the Addendum makes clear that the mere examination of this scenario should not be construed as advocating for or against the G- J locality nor a commentary on potential ICAP market rules for creating or eliminating localities. Instead, this potential scenario was one of many under which the performance of the proposed projects was evaluated, and it was not accorded significant weight in the Board's project selection decisions.

Hudson Valley residents<sup>9</sup> argue that we should re-examine the justification for selecting any AC Transmission Public Policy Transmission Project. They cite the MMU's benefit cost ratio ("B/C Ratio") of 0.74 for Project T019 in the baseline case and conclude that the Board should not select a project with a ratio of less than 1.0. Additionally, they argue that the MMU's higher B/C ratio of 1.52 in the CES+Retirement scenario is based on faulty assumptions, particularly the level of off-shore wind resources modeled, and should be discounted entirely. We find these arguments unpersuasive. Although the B/C Ratio provides important guidance, the Board considers the full range of quantitative and qualitative metrics in project selection, and is not limited to selecting a project only if it exceeds a B/C Ratio of 1.0. In addition, while there remains significant uncertainty concerning how New York's policy objectives will be met given evolving state policies and technological advances, the CES+Retirement scenario provides a reasonable outlook for considering how new transmission projects would perform under state policies they are designed to facilitate.

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<sup>9</sup> Town of Clinton, Town of Milan, Milan Hall Farm, Walnut Grove Farm, Farmers and Families of Claverack, Farmers and Families for Livingston, Pamela Lovinger, and Town of Livingston.

Finally, various developers and stakeholders have identified elements of the Public Policy Process that may benefit from further enhancement or clarification to improve the efficiency and transparency of the process, including providing for additional consultation with the Board throughout the process. The Board is aware that the process has been lengthy and could benefit from further enhancements to improve efficiency and transparency. NYISO staff will review lessons learned through the AC Transmission Needs process with stakeholders and is separately performing an extensive review of the Comprehensive System Planning Process. We direct NYISO staff to consider the suggestions raised by stakeholders and developers as part of these reviews, and to keep the Board apprised of its progress.

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