

**MINUTES OF THE
PLANNING ADVISORY COMMITTEE (PAC)
MEETING HELD ON FEBRUARY 28, 2024**

Attendee	Organization
J. Truswell (Chair)	ISO New England
J. Macura (Secretary)	ISO New England
K. Adan	NextEra Energy
Z. Ahmed	ISO New England
R. Albrecht	Ray Albrecht, LLC
B. Andrew	Eversource Energy
S. Allen	Eversource Energy
C. Aquino	ISO New England
P. Asarese	ISO New England
N. Baldenko	Eversource Energy
K. Bane	ISO New England
D. Basler	Chaco Companies
S. Beale	NESCOE
D. Bergeron	ME PUC
P. Bernard	ISO New England
T. Blanco	New England Power Company
C. Bothwell	Department of Energy
D. Bradt	Oxford Power
J. Breard	ISO New England
J. Brodbeck	EDPR
R. Brody	CT Global
D. Burnham	Eversource Energy
K. Caiazzo	MA Attorney General's Office
E. Chapin	Onward Energy
A. Chaplin	New Leaf Energy
P. Chardavoyne	ISO New England
M. Coleman	JerraAmericas
R. Collins	ISO New England
W. Coste	ISO New England
F. Dallorto	ISO New England
W. Dejeanlousi	Synapse
J. Dong	Eversource Energy
J. Donovan	MA Attorney General's Office
M Doolin	ISO New England
M. Drzewianowski	ISO New England
L. Durkin	ISO New England
F. Etti	VELCO

J. Fenn	Fennco, LLC
A. Feygin	ISO New England
B. Forshaw	Energy Market Advisors
N. Forester	NESCOE
K. Fougere	Avangid (CMP/UI)
B. Fowler	Wheelabrator North Andover Inc.; Exelon Generating Company LLC; Nautilus Power; Dynegy Power Marketing, LLC; Entergy Nuclear Power Marketing LLC; Great River Hydro, LLC
J. Fu	Department of Energy
J. Fundling	Eversource
A. Gagnon	MA Attorney General's Office
S. Garwood	New Hampshire Transmission
A. Gillespie	Calpine
M. Gonzalez	ISO New England
M. Grover	Eversource Energy
R. Guay	Maine PUC
L. Guilbault	H.Q. Energy Services
J. Halpin	Eversource Energy
R. Harvey	IEEE
M. Haskell	Maine PUC
H. Hunt	NESCOE
N. Hutchings	NextEra Energy
J. Iafrati	Customized Energy Solutions
G. Joshi	Rhode Island Energy
S. Judd	ISO New England
S. Keane	NESCOE
R. Kornitsky	ISO New England
N. Krakoff	Conservation Law Foundation
A. Krich	Boreas Renewables
F. Kugell	Central Maine Power Company
R. Lafayette	Eversource Energy
S. Lamotte	ISO New England
A. Landry	ME OCA
A. Lawton	Advanced Energy United
L. Li	EDPR
P. Lopes	DCAM, Commonwealth of Massachusetts
W. Lu	ISO New England
J. Lucas	Eversource Energy
T. Lundin	LS Power
K. Mankouski	ISO New England
O. Marsden	Equinor

J. Martin	New England Power Company
T. Martin	New England Power Company
C. Mattioda	Synapse
R. McCarthy	ISO New England
P. McDonald	ISO New England
S. Molodetz	NextEra Energy
A. Nichols	ISO New England
B. Oberlin	ISO New England
R. Panos	New England Power Company
K. Pastoriza	Member of the Public
H. Pathan	Eversource Energy
D. Patnaude	Eversource Energy
M. Perben	ISO New England
E. Perez-Cervera	ISO New England
J. Porter	Rhode Island Energy
H. Presume	VELCO
K. Quach	ISO New England
N. Raike	ISO New England
J. Rauch	Avangrid (CMP/UI)
A. Rawat	New England Power Company
M. Ribeiro Dahan	ISO New England
C. Richards Jr.	PPL
B. Robertson	Eversource Energy
E. Runge	Day Pitney
M. Safi	PPL
K. Schlichting	ISO New England
D. Schwarting	ISO New England
M. Scott	New England Power Company
G. Shen	ENTRUST Solutions Group
J. Slocum	MA Dept. Transportation
B. Snook	Maine Governor's Office of Energy
C. Soderman	Eversource Energy
P. Sousa	South Coast Wind
J. Stark	Eversource Energy
T. Sweeney	NH Dept. of Energy
C. Szmodis	Rhode Island Energy
J. Talbert-Slagle	CT OCC
P Tatro	ENTRUST Solutions Group
Z. Teti	Avangrid
B. Thomson	Rhode Island Energy
A. Trotta	United Illuminating
G. Twigg	NECPUC
M. Valencia-Perez	ISO New England

P. Vijayan	ISO New England
G. Wade	MA DPU
F. Walsh	Avangrid (CMP/UI)
J. Walters	CT DEEP
D. Ward	FERC
K. Wei	NextEra Energy
B. Wilson	ISO New England
M. Winne	ISO New England
J. Zhang	ISO New England
C. Zhu	New England Power Company

Item 1.0 – Chairs Remarks

Ms. Jody Truswell welcomed PAC and reviewed the day’s agenda. Ms. Truswell explained expectations for stakeholder participation and comments at PAC meetings.

Item 2.0 – SEMA 2028 Short Circuit Solutions Study **CEII**

Ms. Sarah Lamotte (ISO-NE) presented the SEMA 2028 Short Circuit Solutions Study, summarizing that six Pool Transmission Facility (PTF) breakers over 100% of their interrupting rating are time-sensitive needs with a need by date of June 1, 2026. The replacements have an estimated cost of \$13.3M (+50% / 25%) with an in-service date of June 2027. ISO-NE did not consider any other solution alternatives because replacing the high duty breaker is the most cost effective solution.

ISO-NE issued the following statement in response to stakeholder questions:

- Eversource accounts for long lead-times when acquiring certain new equipment. The timeline also are factors in scheduled outages for breaker replacements.

Item 3.0 – NETO Update on Asset Condition Guidance Document

Mr. David Burnham (Eversource Energy) notified PAC that the NETO’s Asset Condition Guidance Document would be delayed from March 2024 until May 2024. The NETO’s originally estimated this document would be presented at the March PAC. However, as work progressed, their initial assessment did not accurately reflect the required time to improve the quality of the document.

Eversource Energy issued the following statements in response to stakeholder questions:

- The March delivery date was a tentative estimation.
- The Asset Condition Guidance Document is still in the drafting and editing stage.
- The NETOs understand this document is a priority to the states and consumer advocates and the NETOs plan to work diligently completing it.

The following comments were issued:

- NESCOE requested the NETOs provide a criterion based asset condition guidance document by the end of 2023. This delay results in more projects advancing through this process without an opportunity for meaningful review.
- NESCOE is hesitant to move forward with right-sizing conversations under the status quo.
- Many stakeholders requested the NETOs present its draft Asset Condition Guidance Document in March and its final version in May. The proposed delay provides a disservice to the region's consumers.
- NESCOE's work is reliant on the completion of the Asset Condition Guidance Document.
- Consumer advocates should reach out to FERC directly.
- Consumer advocates are growing impatient with Transmission Owners (TOs) and do not feel the current process offers a robust or meaningful opportunity to review projects before construction.
- The X-178 project should not move forward until the Asset Condition Guidance Document has been completed.

Item 4.0 – Sand Bar Phase Shifting Transformer Asset Condition

Mr. Hantz Presume (VELCO) presented history of phase shifting transformer (PST) failures at Sand Bar substation. VELCO considered three alternatives to extend the life of the Sand Bar PST. Alternative 1 calls for the installation of a second PST, while Alternative 2 is broken into different avenues, either a full PST replacement with SmartValve or a PST augmentation with a SmartValve. VELCO has identified Alternative 2B's SmartValve augmentation as its preferred solution. The project's estimated cost (after subtracting the Department of Energy's funding) is \$33.9M (+50%/-25%).

VELCO issued the following statements in response to stakeholder questions:

- The SmartValve alternatives address VELCO's post-contingency concerns with losses of generation.
- VELCO's DOE funding application did not include Alternative 2A.

The following comments were issued:

- VELCO's preferred solution is advantageous given the available technology.

Item 5.0 – New Hampshire Line X-178 Rebuild

Mr. Chris Soderman (Eversource Energy) presented the asset condition needs prompting Eversource's X-178 line rebuild project in New Hampshire. The line runs roughly 49 miles and accounts for 594 structures between the Beebe River substation and the Whitefield substation. In 2022, Eversource conducted line inspections, which identified 41 Priority C structures, 535 Priority B structures, and 4 Priority A structures. Eversource has selected a full line rebuild of 580 structures coupled with OPGW installation as its preferred solution. The project's estimated cost is \$384.61M (-50/+200%).

Eversource Energy issued the following statements in response to stakeholder questions:

- The category “Access Opportunity” replaces structures on X-178 with light-duty steel while addressing asset condition concerns that presents a cost efficiency for the region because it avoids the added expense for re-accessing this remote line.
- Eversource has lost confidence in retaining laminate wood due to the lack of visibility identifying a structure’s internal conditions. As such, the two laminate wood structures will require replacement.
- Eversource did not prepare a cost estimate for just Priority C and laminate structure replacements because of the access opportunities for this remote location.
- At this time, ISO-NE’s Tariff does not include a regional right-sizing process to incorporate into TO’s asset condition proposals.
- The appendix lists the applicable local, state, and federal permits required for this project.
- Eversource encourages continued stakeholder feedback on this proposal, either written and/or oral, throughout this process.
- Eversource will follow up with specifics on the X-178 line’s construction history. The development of this line span various decades as utilities acquired different easements in anticipation of future buildout.
- Eversource will provide an updated map to depict a more accurate project location.
- Eversource does not typically cover its pole tops to protect against deterioration since they offer limited protection.
- Priority D structures possess a “severe defect” that requires immediate action. Priority C structures have a “moderate defect” and should be addressed in the near future during the next maintenance cycle. An asset condition’s maintenance cycle does not fall into a firm 10-year period, but rather, initiates as needed.
- Supervisory Control and Data Acquisition (SCADA) is a control system used to make changes to the system. Dynamic Disturbance Recorder (DDR) provides data used to monitor wide-area disturbances to determine the system’s electromechanical transient and post-transient response and validate a system’s performance. Typically, strategic studies (angular, frequency, voltage, and stability) identify DDR’s placement.
- The X-178 asset condition project is not driven by OPGW needs.
- Eversource did not consider ACCC conductors for this project because of the way they swing due to their low weight.
- An area’s climate is a critical factor to consider when selecting conductors for a project. A conductor installed on a transmission line in Texas may not be ideal for an area like New England. ACCC conductors are better suited for areas like Texas because they do well in high temperature.
- The fiber in OPGW is enclosed so it is secure from external elements.
- The primary drivers for OPGW installation and structure are failure under the structure failing guidelines.
- Asset conditions have broad range of drivers, which can lead to confusion.
- The chart indicates that 43 structures are in jeopardy of failure. A single full rebuild, including OPGW installations could offer long-term economic savings due to the significant costs required to access this remote line. A dedicated fiber optic line of communication will

be required in the future so addressing it now rather than parsing out needs at different times is financially advantageous.

- Eversource will circle back to confirm whether this line was identified as overloaded or not in the 2055 Transmission Study.
- Eversource is unsure how the line's rating will be impacted after replacing all the conductors. It could lead to a 40-50% increase in the line's capacity.
- The X-178 line is preferred for OPGW installation because Eversource does not have a high speed communication path serving the North Country loop.
- Eversource has not conducted cost estimates without OPGW installations. As such, Eversource cannot provide a project cost break down on the percentage for OPGW installations versus the 43 structure replacements identified as an asset condition need.
- Eversource will follow up with additional information on the cost effectiveness of the proposed full rebuild proposal by including the additional structure replacements.

The following comments were issued:

- Structure replacements driven by "access opportunity" do not seem like an appropriate PTF asset condition need.
- It is difficult to decipher which elements of this proposal are true asset condition needs and which are merely add-ons for desired buildout. It would be helpful to know what needs in this presentation align with the Asset Condition Guidance Document.
- Eversource's proposal to install OPGW on X-178 does not seem like a true asset condition need and its inclusion in this preferred solution feels like a strategic maneuver to regionalize this cost.
- Eversource should coordinate with generators to reduce impacts from scheduled outages during the line's construction. The northern region of New England has a significant amount of generation that could be reliant on this line.

Item 6.0 – M-165 115kV Line Asset Condition Project

Mr. Rafael Panos (National Grid) presented the M-165 asset condition project proposal. This 115 kV line originates at the Millbury 2 No. 302 substation and terminates at the Vernon Hill No.8 substation in Worcester, MA. National Grid's preferred solution focuses on a targeted refurbishment that includes replacing 20 wood poles with steel structures, as well as replacing 4.8 miles of existing shieldwire with OPGW. The project's total cost is \$16.824 M, with PTF costs estimated at \$15.179M and non-PTF costs at \$1.644M (+/- 10% accuracy). The in-service date is set for Q1 2025.

National Grid issued the following statements in response to stakeholder questions:

- National Grid will work offline with generators to coordinate scheduled line outages during construction.
- National Grid anticipates construction to begin March 2024.
- National Grid strives to present asset condition projects for PAC review at least 3 months ahead of construction.

- The project's Transmission Cost Allocation application has been presented to the Reliability Committee.
- National Grid attributes this delayed PAC presentation to difficulties with cost estimation.

The following comments were issued:

- A few stakeholders noted the narrow gap between this PAC presentation and the project starting construction does not afford stakeholders a meaningful opportunity to provide feedback or ask questions.
- A stakeholder reiterated the growing need for increased visibility and transparency in the asset condition process.

Item 7.0 – Boston 2033 Needs Assessment (NA)

Mr. Fabio Dallorto and Ms. Annalyse Nichols (ISO-NE) presented the Boston 2033 NA. The objective of the Boston 2033 NA is to evaluate the reliability performance of the Pool Transmission Facilities (PTF) and identify reliability-based transmission needs in the Boston study area for the year 2033.

ISO-NE issued the following statements in response to stakeholder questions:

- System-wide load numbers can be found in the scope of work.
- The available ADCR was modeled as -76 MW during peak load scenarios..
- For daytime minimum load cases, the high voltage violations increased by a very small amount from the high voltages in the nighttime minimum cases (less than 0.01 p.u.).
- The ISO conducted a sensitivity to identify if any potential future asset condition projects associated with underground cables may alleviate needs in the study area.
- The impacts from the Hecate Energy Eastern Ave Energy Center were studied in a sensitivity case for the time-sensitive year and the dispatch of the new resource is based on the ISO's battery storage assumptions as documented in the Transmission Planning Technical Guide.
- The ISO balances transmission loadings into the Boston area from the north and south without overloading facilities by using both pre- and post-contingency phase shifter adjustment.
- The recent changes to PP5-6 related to dispatch assumptions for solar and battery resources are only applicable to Elective Transmission Upgrades (ETU) and generator interconnection studies. The Transmission Planning Technical Guide (TPTG) is the correct document for DER assumptions in Needs Assessments and these were used for the Boston 2033 Needs Assessment. There is no current ISO effort underway to update the DER scenarios in the TPTG for Needs Assessments.
- The ISO will assess any impacts the Longer-Term Transmission Planning Phase 2 process and whether it is appropriate to include any non-time sensitive needs in the request for proposal (RFP).

Item 8.0 – Economic Planning for the Clean Energy Transition (EPCET) – Additional Sensitivities

Mr. Ben Wilson (ISO-NE) presented additional Policy Scenario sensitivities, which included a 100-hour BESS, HQ bidirectional line, and price responsive load.

ISO-NE issued the following statements in response to stakeholder questions:

- The 100-hour BESS sensitivity represents an alternative economic solution to decarbonize the region.
- The ISO relies on published whitepapers to help determine rough estimate cost for theoretical solutions.
- The long duration storage operation in the 100-hour BESS sensitivity is similar to the Future Grid Reliability Study alternative B.
- Batteries started the year 50% charged. This follows historical modeling assumptions.
- The HQ bidirectional tie line sensitivity sets high-level assumptions extending to 2050.
- The ISO used data from the Energy Information Administration (EIA) in its offshore wind modeling.
- The HQ bidirectional tie line sensitivity assumes all new solar and wind resources have the same threshold price (-\$10/MWh).
- In 2040, total costs (built, fixed, production costs) are \$1.77 billion/year lower than similar amounts of decarbonization and zero carbon energy.
- The \$5/MWh designation for the import on bidirectional line was selected because it was positive and close to zero.
- The ISO selected to model electrolyzers in the price response sensitivity because electrolyzers have tax credits and cost estimates.
- The ISO got production tax credit information from the IRA.
- The price response sensitivity assumes existing interconnection agreements, such as New England Clean Energy Connect (NECE).

The following comments were issued:

- A stakeholder noted concern that increased cold snaps could lead to constraint on future flows from HQ to the rest of New England.
- A stakeholder cautioned the ISO from making optimistic winter assumptions.
- A stakeholder noted confusion between build costs and fixed costs in the base model and HQ bidirectional.

Item 9.0 – Transmission Planning Technical Guide (TPTG) Update – Updates to Load Power Factor Assumptions and Other Modeling Assumptions

Ms. Jinlin Zhang (ISO-NE) presented updates to Load Power Factor assumptions, steady state power flow solution settings, treatment of Local System Plans in various studies, as well cleanup in the TPTG.

There were no stakeholder questions.

Item 10.0 – Closing Remarks/Adjourn for the Day

Ms. Truswell announced the next PAC meeting is on Wednesday, March 20, 2024.

The meeting adjourned at 2:11 P.M.

Respectfully submitted,

_____/s/____

Jillian Macura

Secretary, Planning Advisory Committee