

**Planning Advisory Committee
WebEx Teleconference
January 20, 2022**

Attendee	Organization
J. Truswell - Chair	ISO New England Inc.
M. Lyons - Secretary	ISO New England Inc.
M. Ainspan	NRG
R. Albrecht	National Diesel Bio Board
S. Ali	PPL Energy Plus
M. Allen	VELCO
S. Allen	Eversource Energy
B. Anderson	NEPGA
R. Andrew	Eversource Energy
E. Annes	Connecticut Public Utilities Commission
P. Bernard	ISO New England Inc.
P. Boughan	ISO New England Inc.
J. Breard	ISO New England Inc.
J. Black	ISO New England Inc.
J. Burlew	ISO New England Inc.
D. Burnham	Eversource Energy
K. Caiazza	Massachusetts Attorney General Office
D. Capra	NESCOE
L. Cecere	Vermont Public Utilities Commission
S. Chen	RLC Engineering

R. Collins	ISO New England Inc.
M. Connors	ISO New England Inc.
B. D'Antonio	NESCOE
M. Drzewianowski	ISO New England Inc.
F. Etori	VELCO
B. Forshaw	CMEEC
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
S. Garwood	New Hampshire Transmission
B. Griffiths	Jericho Power
L. Guilbault	HQ US
E. Friedman	Moody's Analytics
D. Hurley	Synapse Economics
N. Hutchings	ISO New England Inc.
J. Iafrati	Customized Energy Solutions
M. Jacobs	Union of Concerned Scientists
S. Judd	ISO New England Inc.
S. Kaminski	New Hampshire Electric CoOp
T. Kaslow	First Light Power Management
S. Keane	NESCOE
S. Kirk	Exelon
A. Kniska	ISO New England Inc.
R. Kornitsky	ISO New England Inc.
R. Kuhr	The Shaw Group
A. Krich	Boreas Renewables

B. Kruse	Calpine
F. Kugell	Avangrid
E. Laine	ISO New England Inc.
S. Lamotte	ISO New England Inc.
P. Lopes	Massachusetts DOER
J. Lucas	Eversource Energy
T. Lundin	LS Power
J. Martin	New England Power Company
T. Martin	New England Power Company
M. McDermott	Moody's Analytics
B. McKinnon	South Hadley Electric Light, Norwood Municipal
J. Moskal	US EPA
A. Nichols	ISO New England Inc.
W. Nuara	Dominion Energy Generation
B. Oberlin	ISO New England Inc.
L. Ortiz	Anbaric Development Partners
H. Presume	VELCO
M. Purdie	Dominion Energy Generation
S. Rastegar	ISO New England Inc.
C. Richards	PPL Energy Plus
V. Rojo	ISO New England Inc.
J. Rotger	Galt Power, Cross Sound Cable, BP Energy, Mercuria Energy and DTE Energy
E. Runge	Day Pitney
H. Saarela	ISO New England Inc.
A. Sarmadi	New England Power Company

M. Saravanan	ISO New England Inc.
D. Schwarting	ISO New England Inc.
M. Scott	New England Power Company
P. Silva	ISO New England Inc.
C. Soderman	Eversource Energy
R. Stein	Generation Group Member, NRG Power Marketing, HQ Energy Services, PSEG Energy Resources & Trade, SunEdison
B. Swalwell	Tangent Energy
D. Thompson	Connecticut OCC
B. Thomson	MMWEC
P. Turner	Conservation Law Foundation
R. Vega	ISO New England Inc.
P. Vijayan	ISO New England Inc.
A. Weinstein	Dynegy Marketing and Trade
B. Wilson	ISO New England Inc.
P. Wong	ISO New England Inc.
A. Worsley	Transmission Analytics
J. Zhang	ISO New England Inc.

Item 1.0 – Chairs Remarks

Ms. Jody Truswell welcomed the committee and reviewed the days’ agenda.

Item 2.0 – Moody’s Analytics Economic Update

Mr. Edward Friedman (Moody’s Analytics) provided an update regarding the overview of the national and regional economy. Moody’s anticipates a challenging road to full recovery due to the ongoing Covid epidemic impacts to the supply chain and inflation.

In response to stakeholder questions, the Moody’s representative made the following statements:

- Full employment” is expected by 2023

- Inflation is expected to diminish over the next year and a half as a result of decreasing energy prices, easing of supply chain issues and Fed actions regarding the monetary policy. Even if the Fed raises rates to 2%, that is still a historically low number.
- The demand for commercial real estate offices continues to decline. Currently 25% of people are working remotely versus < 3% pre-pandemic. Employers are embracing working remotely as they do not need to purchase and maintain office space. Workers like it because it provides a great deal of flexibility.

Item 3.0 – Eversource P-145 Line Rebuild Asset Condition and Optical Ground Wire (“OPGW”) Project

Mr. Chris Soderman (Eversource Energy) provided an overview regarding P-145 Line Rebuild Asset Condition and Optical Ground Wire (“OPGW”) Project. The 115 kV P-145 Line is a 12.5 mile overhead line from Merrimack Substation and Farmwood Substation in south-central New Hampshire. The line was originally constructed in 1966 using 795 36/1 ACSR conductor. The line consists of 165 structures, primarily wood H-Frame, with 128 of the structures needing replacement due to asset conditions. The conductor is being replaced with 1272 ACSS 54/19 conductor. The existing copperweld shield wire is obsolete and will be replaced with OPGW. Project costs are estimated to be \$52M (-25%/+50%) with an estimated project in service date of Q1 2024.

In response to stakeholder questions, the Eversource representative made the following statements:

- This project is expected to increase the thermal capability of the line.
- Eversource is project focused based on the individual evaluations of the lines and they are repaired as needed. However, Eversource does try to stagger these types of projects so customers do not incur the project costs all at once.

Item 4.0 – VELCO K-42 Transmission Line Replacement Project

Mr. Hantz Presume (VELCO) provided an overview of the VELCO K-42 Transmission Line Replacement Project. The 115 kV K-42 Line is 16.6 miles of overhead line from Highgate to the Highgate Converter Tap to St. Albans Tap to Georgia Substation in northwest Vermont. The Line was originally constructed in 1958. An asset condition inspection found that roughly 70% of the line structures are in need of replacement. The recommended solution is to replace the line with double-bundle 1272 ACSR design along with the structures. Project costs are estimated to be \$48.99M.

- In response to stakeholder questions, VELCO and ISO explained that this asset condition project is different from past projects of this type as they are not proposing to build it using VELCO’s standard single conductor, but instead are proposing to build the project with two conductors per phase, which is not typical for 115 kV lines. For an additional

\$6M in project costs, the line ratings will increase from approximately 300 MVA for a single conductor configuration to close to 600 MVA for a double bundled conductor, in addition to strengthening the network in the local area. Stakeholders expressed support for upsizing the project projecting for future needs.

Item 5.0 – Interregional Planning Update

Mr. Steven Judd (ISO-NE) provided an update regarding the interregional planning as well as the eastern interconnection. The Atlantic Offshore Wind Transmission Study is being led by National Renewable Energy Laboratory (NREL) and funded by the Department of Energy (DOE). The objective of the study is to evaluate multiple pathways to offshore wind goals through coordinated transmission solution along the U.S. Atlantic Coast in the near term (by 2030) and long term (by 2050) under various combinations of electric supply and demand while supporting grid reliability and ocean co-use. The study is expected to be concluded by October 2023. The DOE is also funding a National Transmission Planning Study performed by the national labs that will conclude by the end of 2023. The objectives of the study are to improve DOE’s understanding of the characteristics of the future power grid needed to meet the Administration’s 2035 clean electricity goals cost-effectively and under new, high stress conditions. The presentation was concluded with an Eastern Interconnection Planning Collaborative (EIPC) update. EIPC issued a “State of the Grid” report in December 2021 that summarized the activities of EIPC.

There were no questions from the committee on this topic.

Item 6.0 – Environmental Update

Mr. Patricio Silva (ISO-NE) provided the committee with an environmental update. In 2021, generating resources and transmission assets reported no issues with state or federal environmental compliance requirements. Preliminary data and estimates suggest New England power system carbon dioxide, nitrogen oxide and sulfur dioxide emissions remained near historic lows in 2021. Estimates suggest New England power system water use and wastewater discharges are near historic lows in 2021. However, environmental requirements in the siting, permitting and operation of energy infrastructure affect fuel supplies, generating resources, and transmission assets.

There were no questions from the committee on this topic.

Item 7.0 - 2021 Economic Study - Future Grid Reliability Study (FGRS) Phase I – Final Production Cost Results

Mr. Patrick Boughan and Mr. Richard Kornitsky (ISO-NE) provided an overview of the final production cost results for the 2021 Economic Study - Future Grid Reliability Study (FGRS) Phase I. As a reminder, the FGRS is a gap analysis and any observations made as part of the study were to identify gaps and not provide solutions.

In response to stakeholder questions, ISO-NE provided the following statements:

- Storage is not a net energy producer so there is no production cost assigned.
- In regards to a statement in the second bullet of slide 50 of the presentation, that storage has limited opportunities to operate during times of extended curtailment, there was a long window of low LMPs. Given that there is only a seven day look-ahead for storage in GridView, there were limited opportunities to arbitrage prices in that window.
- Battery operation in GridView optimizes usage to maximize profits for the batteries (with a seven day look-ahead). While not an option in GridView, they could be operated or modeled differently in the future based on system conditions versus strictly on LMPs.

Several stakeholders expressed appreciation for ISO's work on this presentation and the whole FGRS initiative.

Item 8.0 - 2021 Economic Study - Future Grid Reliability Study (FGRS) Phase I – Preliminary Ancillary Analysis Results – Part 4

Mr. Patrick Boughan and Mr. Ben Wilson (ISO-NE) provided an overview of Part 4 of the Preliminary Ancillary Analysis Results for the 2021 Economic Study - Future Grid Reliability Study (FGRS) Phase I. On average, S3 cases spend 1% of the year with operating reserves depleted. The operating reserve fix lowers the total regulation need, but Scenario 3 cases still have high needs compared to Scenario 0 and Scenario 1 cases. Electric Power Enterprise Control Simulation (EPECS) analysis has identified an increased need for regulation or other reserve products in power systems with higher renewable penetration. The results also show the differences in magnitude of need among various resource mixes within the model. A faster Security Constrained Economic Dispatch (SCED) period decreased the regulation need. Adding more operational reserves to target wind and solar variability helped mitigate regulation needs. Batteries can be used to mitigate regulation needs, but regulation needs may increase if energy availability is short.

In response to a stakeholder question, ISO stated that if the batteries are running low and reducing or eliminating their output we anticipate the regulation supply will come from other types of generation that have regulation capability.

Several stakeholders again expressed appreciation for ISO's work on this presentation and the whole FGRS initiative.

Item 7.0 – Closing Remarks

The next regularly scheduled PAC meeting will be Friday, February 11, 2022 via WebEx Teleconference. There will be a Joint MC/RC meeting scheduled for Wednesday, February 16, 2022 to continue discussions on the FGRS study.

Meeting Adjourned at 3:40 PM

Respectively submitted,

Marc Lyons
Secretary, Planning Advisory Committee