Planning Advisory Committee
WebEx Teleconference
June 17, 2020

Joe Adadjo	Eversource Energy
Barry Ahern	New England Power Company
Malcolm Ainspan	NRG
Ray Albrecht	
Bruce Anderson	NEPGA
Bob Andrew	Eversource Energy
Erik Annes	Connecticut Public Utilities Commission
Christina Belew	Massachusetts AG Office
Ashley Bennett	Levitan Associates
Denis Bergron	Maine Public Utilities Commission
Peter Bernard	ISO New England Inc.
David Beron	New England Power Company
Patrick Boughan	ISO New England Inc.
Cal Bowie	Eversource Energy
Jon Breard	ISO New England Inc.
Tim Brennan	New England Power Company
Mark Brown	
Eric Bryant	Maine Public Utilities Commission
David Burnham	Eversource Energy
Andrew Byrne	
Erin Camp	Synapse Economics
Dorothy Capra	NESCOE
Dave Cavanaugh	Energy New England
Jeff Cebrik	Avangrid
Digaunto Chatterjee	Eversource Energy
Steve Conant	RLC Engineering
Molly Conners	ISO New England Inc.
Wayne Coste	ISO New England Inc.
Ray Coxe	Moasic Energy for Brookfield Renewables
Fabio Dallorto	ISO New England Inc.
Ben D'Antonio	NESCOE
Avadhish Dewal	ISO New England Inc.
Vandan Divatia	Eversource Energy
Janny Dong	New England Power Company
Deborah Donovan	Seadvantage
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Kate Bashford Epsen	ISO New England Inc.
Bernardo Escudero	Avangrid
Frank Ettori	VELCO
Peter Everin	
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David Fishman	
Kevin Flynn	ISO New England Inc.
Ellen Foley	ISO New England Inc.
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Nick Gangi	Eversource Energy
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Steve Garwood	New Hampshire Transmission
Ryan Gibbons	Avangrid
Joel Gordon	PSEG
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Paul Holloway	Massachusetts Public Utilities Commission
Heather Hunt	NESCOE
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Jeff Iafrati	Customized Energy Solutions
Mike Jennings	New Hampshire Electric CoOp
Devang Joshi	
Steve Judd	ISO New England Inc.
Matt Kakley	ISO New England Inc.
Steve Kaminski	New Hampshire Electric CoOp
Tom Kaslow	FirstLight Energy
Bruce Kay	ISO New England Inc.
Shelia Keane	Massachusetts Department of Public Utilities
Kevin Kilgallen	Avangrid
Neil Kirby	Alstom
Steve Kirk	Exelon
Andrew Kniska	ISO New England Inc.
Rich Kowalski	ISO New England Inc.
Nick Krakoff	
Ed Krapels	Anbaric
Abby Krish	Boreas Renewables
Brett Kruse	Calpine
Michael Kuser	Michael Kuser
JP Kwasie	Anbaric
Kaushal Kumar	ISO New England Inc.
Robin Lafayette	ISO New England Inc.
Sarah Lamotte	ISO New England Inc.
Steve Letendre	Synapse Economics
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Jason Marshal	NESCOE
Jack Martin	New England Power Company
Tim Martin	New England Power Company
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Dan Mitterstaedt	
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Bruce McKinnon	South Hadley Electric CoOp/Norwood Municipal
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Phil Tatro	EIG
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Brian Thompson	MMWEC
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Jeff Turcotte	ISO New England Inc.
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Pradip Vijayan	ISO New England Inc.
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Wayne Wang	Massachusetts Public Utilities Commission
Andy Weinstein	Borrego Solar
Carol Wendel	ISO New England Inc.
Lawrence Willick	LS Power
Mariah Winkler	ISO New England Inc.
Alex Worsley	
Fei Zeng	ISO New England Inc.
Jinlin Zhang	ISO New England Inc.
Chelsea Zhu	New England Power Company

Item 1.0 – Chairs Remarks

Mr. Pete Bernard welcomed the committee and reviewed the days' agenda.

The ISO has begun work with DNV to create expanded historical renewable hourly power time series data. The new data set will span from 2000 through 2019 and will include wind data by plant, distributed solar PV data aggregated by load zone, and customer load by load zone for the 20-year period. The second phase of the project will use the 20 years of correlated wind, solar, and load data and enter it into DNV's stochastic weather generator program to produce 1,000 statistically similar weather years. This data will then help the ISO develop more stochastic based renewable outputs based upon historical weather conditions. The ISO will give a presentation at the July PAC detailing the project further.

Mr. Bernard also wanted to let everyone know that the 2019 Anbaric Economic Study Energy Storage Modeling PowerPoint has been posted to the PAC section of the ISO website as part of the Meeting Materials for today's meeting. This PowerPoint addresses inquiries made at the May 20, 2020 PAC meeting, and information is being provided to further explain the battery and pumped storage modeling methodology used in the 2019 Anbaric Study, as well as describes the

energy storage results. If you have further questions concerning the Energy Storage Modeling in the 2019 Anbaric Economic Study PowerPoint, please submit them to the PACMatters email.

Finally, Mr. Bernard welcomed Marc Lyons back as the Secretary of the PAC and thanked Avadhish Dewal for serving as the acting PAC Secretary while Marc was away. This was a new and different role for Avadhish and he did a great job preparing for each PAC meeting, posting material to the PAC website, and assisting me with running the PAC meetings. Thank you Avadhish.

Item 2.0 – Boston 2028 RFP – Review of Phase One Proposals

Mr. Robert Either (ISO-NE) provided background information on the work ISO-NE performed on the 36 submitted Boston 2028 Boston Phase One Proposals from eight QTPS respondents.

Mr. Brent Oberlin (ISO-NE) discussed the ISO's review of the Phase One Proposals received in response to the Boston 2028 RFP. This discussion provided a review of the ISO's methodology for evaluating the Phase One Proposals, which included a preliminary review to ensure that the identified needs were addressed and that the Tariff and RFP requirements were met. For those remaining proposals, an opportunity was provided to cure minor deficiencies. Following a review of these responses, the ISO created a draft listing of proposals that met the requirements of Attachment K, Section 4.3(e), which then led to the draft list of qualifying Phase One Proposals.

There were several questions and comments from stakeholders:

Q – Did the developers provide the in-service dates (ISDs) of the projects? If so, how did ISO determine that they are feasible.
A – The QTPSs provided the in-service dates of the projects. ISO-NE used our experience to determine the feasibility of each proposal to meet its ISD. Additionally, two outside consulting teams with expertise in this area were retained by the ISO and they provided input as to whether an ISD was feasible or not.
Q – Was there a consideration that Mystic 8 could be placed out of service prior to the June 1, 2024 date through coordinated outages to facilitate an earlier in service date for a possible transmission solution as far as using its terminal position is concerned?
A – There is concern with removing the resource from service that is being relied upon to ensure system reliability. However, we will take that back for further review and discussion.
Q – Would a direct transfer trip (DTT) be considered as additional work beyond the upgrade of existing facilities by the incumbent, or would it be an allowable modification to existing equipment?
A – We consider a DTT modification to the existing protection which is acceptable.

Q - There was some confusion regarding what work a QTPS is able to include its proposal to be done by the incumbents?
A – The incumbents are not obligated to perform construction of new facilities in their right of way for a QTPS project. The QTPS can only propose work to upgrade existing incumbent facilities in their rights of way or to interconnect the proposed equipment to substations owned by the incumbents.
Q – What are permissible upgrades for incumbents?
A – Replacement of existing equipment unless it is associated with the interconnection of QTPS facilities.
Q – Does the replacement of an existing facility have to be like for like upgrades?
A- It could be the replacement of anything that exists like the replacement of conductor with a larger size.
Q – Is rebuilding towers permissible?
A- Yes, because it would be considered a replacement of existing equipment.
Q – Were the questions on Right of Way and Reactive Capabilities clearly spelled out in the RFP given all the Phase One rejections?
A – ISO-NE believes the expectations for Right of Way and Reactive Capability were very clear in the RFP and Tariff. These items were also discussed in many previous stakeholder meetings. The ISO did receive proposals that correctly followed the instructions in the RFP.
Q – The transformer as part of the STATCOM should not have been an issue. The Phase One study is a feasibility study. In the Multiregional Modeling Working Group (MMWG) cases in the Eastern Interconnection, most of the STATCOMs are modelled without a transformer.
A –A Phase One Proposal must demonstrate that the proposal solves all the needs. The proposals did not provide the required transformer data to in the PSS/e idv file, Aspen change file, or the section on new transformers in submittals.
Q – Regarding the cure process, why is charging eligible for the cure process and reactive capability is not?
A – In this case, the QTPS had modeled their equipment and it met the charging requirement but we asked them to review their charging data for accuracy.
Q - I still don't understand why there weren't discussions between the QTPS and ISO to try and cure the STATCOM transformer issue that was mentioned earlier.
A – No modeling information was provided on the STATCOM step-up transformer in the modelling files or proposal narrative, which disqualified the proposal.
Q – Does the Backstop involve single or multiple TOs?
A –The ISO required Eversource and New England Power to submit a joint Backstop Transmission Solution.
Q - The accepted solution involves a Direct Transfer Trip (DTT) scheme. Is the DTT considered a Special Protection System (SPS)?

A – An SPS is now considered a Remedial Action Scheme (RAS). The NERC definition of a RAS excludes DTT as part of it in the event that it simply de-energizes a line after the opening of one terminal, which is the case for this particular scheme.
Q - Were the QTPSs required to submit construction start dates or it was ISO specified?
A – The QTPSs provided the schedule.
Q – At the last NEPOOL Participants Committee (NPC) meeting, it was mentioned that the PAC meeting would be a good place to discuss the project need after FCA 15 is run. We may start construction on a proposal which may not ultimately be needed. Can we push back the project timeline until after FCA 15 is run? Also could cost recovery estimates be provided if the project does not go through?
A – ISO will need to take that back but timelines need to be met for equipment ordering, etc. so that the required in-service date can be met.
Q - Would a generation project in an overlapping study be able to use a DTT in place of a transmission system upgrade?
A – I can't speak for interconnection studies. As of now, it is clear that a DTT is not part of RAS per NERC definition.
Q - Why is the proposed solution a less comprehensive solution than the previous studies in same area that recommended a more elaborate solution? Is the reduced load a cause?
A –The needs were different in October 2019 than we had previously in Greater Boston in 2015. This time we have taken input from Operations and their requirement of dynamic reactive device for system restoration, which was expanded to ensure that customers get the benefit of the device all of the time. The 2019 studies also include a number of other changes on the system since 2015, and we did not split out the impact of each change.
Q – For the reactors, will there be a bypass or will they be in service all the time?
A – We expect the bypass to be normally closed, making the reactors normally bypassed.
Q – Will the DTT proposed with the solution cause load loss in West Amesbury?
A – No, there will be no load loss.
Q – Does the NECEC line have any impact on the Backstop?
A – The Needs Assessment assumptions were vetted, and the RFP study conditions align with those assumptions. The ISO is not prepared to discuss any possible impacts of NECEC or other variations in assumptions at this meeting.
Q - How many man hours and costs went in the Phase One review?
A - Consulting costs are roughly $500k. We will need to look into the ISO costs, but 4 different departments worked on this.
Q – Are the costs incurred by the submitters or the ratepayers?
A - In Phase One, only the work which went into the Backstop Transmission Solution is eligible for cost reimbursement from ratepayers. In addition, a portion of consultant fees will also be borne by the ISO, which are ultimately paid by ratepayers.
Q – If a non-incumbent would have proposed the same solution, would it have been disqualified as it cannot work on incumbent equipment?

A – A non-incumbent cannot require an incumbent to construct new facilities. They can require the incumbent to upgrade existing equipment or protection systems.
Q – If the RFP is over and we move to the solutions process, will a Selected Qualified Transmission Project Sponsor Agreement (SQTPSA) be required? What is the timeframe the solution results be presented to PAC?
A – If we enter the Solutions Study process, there is no SQTPSA needed. The incumbent TO's obligation to build the solution is covered by the TOA, making a SQTPSA unnecessary. The solution could be ready to be presented at the August or September PAC of this year.
Q – If there is no SQTPSA, will there be any cost controls?
A – Eversource and National Grid have provided cost containment as part of their Phase One Proposal.
Comment – The proponents of the Backstop Transmission Solution would honor the cost cap structure they proposed.
Q – Has New England ever considered DTT as a solution to network reliability needs or for a generator interconnection in the past?
A – I do not have information about generator interconnection studies. As far as reliability studies are concerned, they were considered, although never implemented because they did not solve all of the needs.
Q - On slide 49, we show a summary of the Phase One Proposal criteria, but I don't see any consideration of environmental impacts that align with state goals.
A – In the RFP there was a tiered approach to the evaluation factors and the environmental impact would be part of the consideration in Phase 2 if multiple submissions met all other evaluation factors at a comparable cost.
Comment - This was the most informative RFP he has been a part of and very clear on why the Backstop proposal was selected.
Q - We also agree on the impressive work ISO did on this. Is it possible for the Backstop solution be completed earlier than they stated in their proposal?
A – ISO will defer that question to Eversource and NGrid.
Comment – Eversource Energy suggested that this could be possible, and it is being looked into.
Comment - The result that the Backstop solution would be the most economic outcome is a great testament for the RFP process, since it encouraged the development of an economical Backstop solution.
Comment - We do not disagree with the final outcome, but we do have some issues with the procedural process for submissions that could be reviewed for future enhancement.
Comment - We would like ISO to look at section 2.05 of the TOA and Section 210 of the Federal Power Act, as well as to consider the possibility that the NECEC will not go forward and as a result, the Backstop Transmission Solution will not resolve the area needs. Anbaric hopes that a Phase Two Solution evaluation is still conducted, due to some other proposals' ability to address the need for other upgrades due to state policy. We are concerned about miscommunication about the STATCOM size. The criteria about injection at a POI was not clear.

Comment – There was agreement with Mr. Paradise's comments regarding miscommunication on the STATCOM size. He also expressed his concern that a must run generator that can be solved with two reactors. This process gave nothing to the bidders because they cannot compete against a proposal that was so inexpensive.
Comment - NGrid also commends ISO for their work and is committed to work with Eversource to get the project built on time if not sooner within the cost estimates provided.

Item 3.0 – 2020 Public Policy Transmission Upgrade Process

Mr. Brent Oberlin (ISO-NE) reviewed the 2020 Public Policy Transmission Upgrade Process.

There were no questions from the committee on this topic.

Item 4.0 – 2019 Economic Study – Offshore Wind Transmission Interconnection Analysis

Mr. Al McBride (ISO-NE) reviewed the Offshore Wind Transmission Interconnection Analysis as part of the 2019 Economic Study.

Q - Regarding this study, is ISO studying the interconnection at the minimum interconnection standard or the capacity interconnection value?
A – The study is primarily based on what would be required to interconnect and as such, aligns with the minimum interconnection standard. However, for assessing capacity interconnection requirements, offshore wind, as an intermittent resource will be evaluated at the reduced intermittent capacity value. In addition, many issues that were identified in the review, such as right-of-way contingencies and weak grid issues, are issues that cannot be addressed through re-dispatch under the minimum interconnection standard.
Q – Has ISO-NE had a chance to look at the Brattle/GE report on offshore wind integration and does ISO-NE have a comment on how it compares to the ISO-NE study?
A – We have looked at the Brattle/GE study and the findings are comparable both from the perspective that significant onshore upgrade will be required for high levels of injections at the Southern Shore interconnection points and from the perspective of high-level cost expectations.
Q - On slide 10 on the reinforcements from Brayton Point to downtown Boston are on new right of ways. What about the line going into West Walpole? That seems to be on a right of way.
A – For this concept the new 345 kV line would need to be in its own right-of-way going from Brayton Point north to about West Walpole. After that, we did not identify a need for the line to be in its own right-of-way.
Q – Is the $4.0B for the AC cables or would that include all the associated upgrades?
A – The Brattle/GE study quoted $4B for 3600 MWs.
Q – On slide 15, it's mentioned connecting 2200 MWs of HVDC. Where did that come from?
A – It's referenced on slide 8.
Comment – Thanks to ISO-NE for the work put in to the study.

Item 5.0 – New Hampshire Solutions Study Update

Ms. Jinlin Zhang (ISO-NE) provided an update regarding the New Hampshire Solutions Study.

Q – At the RC, was there was an upgrade approved for the central NH area?
A – I believe that you are referring to the B112 line updates, which is part of the NECEC upgrade. Our preliminary study showed that the upgrade will not resolve the area low voltage issue but we will double check and make sure the upgrade is considered in the New Hampshire Solution Study.
Q – Other than costs, what criteria goes into selecting the preferred solution? Will reduced congestion in exported-constrained areas be considered as a factor?
A - If one solution alternative provides significant improvements to the system but the costs were a little more expensive, we would perform additional analysis, such as PV, QV and other comparative analysis to select the preferred solution alternative.
Q – On the synchronous condenser, STATCOM and SVC, will the MW loss be part of the consideration to select the preferred solution?
A – We considered a variety of technologies with a focus on cost and performance. MW losses for each technology will be considered, along with cost estimates and performance of the proposed system upgrades.

Item 6.0 – Regional System Plan Transmission Projects and Asset Conditions – June 2020 Update

Mr. Dan Schwarting (ISO-NE) reviewed the RSP Transmission Projects and Asset Conditions list as part of the June 2020 update.

Q – On slide 14, there's a number of projects with no estimated costs. When we will see these costs? Does the inclusion of these projects with concept status conflict with the elimination of the concept status from the Tariff mentioned in slide 18?
A – These projects are in concept status, meaning that no cost estimate is required. The elimination of the concept status applies only to the RSP Project List and not to the Asset Conditions List portion of the presentation.

Item 7.0 – Representative Future Locational Reserve Needs for Current Reserve Zones

Mr. Fei Zeng (ISO-NE) reviewed the Representative Future Locational Reserve Needs for Current Reserve Zones.

Q – On slide 12, regarding the impact of Killingly and South Meadow retirement, what does that mean?
A – Those are the system condition changes and the corresponding timelines that may have an impact on forward reserve needs in the Connecticut area.

Q – On slide 14, is ISO recommending not performing the analysis for the Forward Reserve Market in the future?
A – Yes. The ISO has proposed to sunset the forward reserve market effective June 1, 2025. The future reserve needs in these reserve zones are expected to zero, therefore there does not appear to have a need of continuing to perform the Forward Reserve analysis going forward.
Q - On slide 32, regarding the study assumptions for NEMA/Boston, according to the June COO Report, the Greater Boston upgrade from Wakefield/Woburn line has been recently changed to December 2021.
A – That was an oversight on ISO's part. We will verify the change and update the presentation if necessary, but it would not affect the analysis results.

Item 8.0 – 2020 Economic Studies
Mr. Patrick Boughan (ISO-NE reviewed the work performed to date for the 2020 Economic Studies.

Q – On slide 19 you mention BTM PV, but are you using that as part of your total values?
A – This is an error. This should be removed for gross load and EE.
Comment – It was unexpected to see the EV load shapes were greatest in HE 17, 18, and 19. I thought there would be incentives provided not to charge in peak hours.
Q – On slide 17, is it proper to use a single year model (2015) for Wind and PV profiles versus using a multi-year average profile?
A – That profile year was requested by NGrid. It was agreed that a multiple year average could get rid of some of the lumpiness. We continue to look at this going forward but we are sticking with the 2015 profile for this study.
Comment - On slide 23, we believe the incentives will be in place by 2035 to charge during off peak hours.
Q – On Slide 17, will the load profile also use the 2015 year?
A – It will use 2017.
Comment – There are some incentives in place today not to charge EV's during peak hours but we also believe the incentives will become greater by 2035.
Comment - – NGrid expressed their appreciation for all the ISO work on this study.
Comment – A request was made to provide a more detailed on the impact of marginal emissions.

Planning Advisory Committee meeting adjourned at 3:25 PM

Respectively submitted

Marc Lyons
Secretary, Planning Advisory Committee