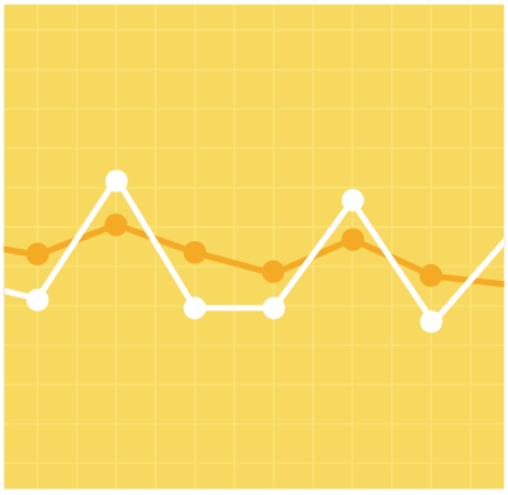
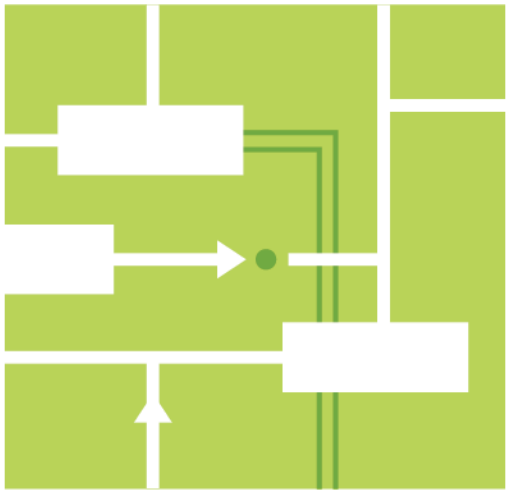
Boston 2028 Request for Proposal (RFP) - Review of Phase One Proposals

JULY 17, 2020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Section 1
Objective and Background

1.1 Objective

This report documents the review of the Phase One Proposals received as a part of the Boston 2028 Request for Proposal (RFP) that was issued on December 20, 2019[1]. The review of Phase One Proposals is the first phase of the competitive transmission process, which can limit the number of Phase One Proposals that advance to the Phase Two Solution process consistent with Section 4.3(g) of Attachment K. This narrowing function is intended to ensure that ratepayers are not paying for the development of projects that have no chance of success, since all QTPSs' Phase Two Solution costs are eligible for cost recovery, including costs incurred by the ISO and its consultants.

The objective of this report is to discuss the methodology used to evaluate the 36 Phase One Proposals received for the Boston 2028 RFP, provide an explanation for the exclusion of Phase One Proposals from consideration in the Phase Two Solution process, and present the final listing of qualifying Phase One Proposals for consideration in the Phase Two Solution process. Consistent with past ISO discussions with stakeholders, at meeting such as the Reliability Committee, Transmission Committee and the Planning Advisory Committee (PAC), related to the Boston 2028 RFP and the RFP itself, "cost and speed" were utilized as the two most important evaluation factors for the review of the Phase One Proposals.[2]

1.2 Background

On October 17, 2019, the Boston 2028 Needs Assessment Update[3] (Boston 2028 NA Update) and the Boston 2028 Needs Assessment Addendum[4] (Boston 2028 NA Addendum) were posted to the ISO website. These reports identified non-time-sensitive needs[5] in the Boston study area, which triggered the competitive solution process.

The Boston 2028 NA Update identified one N-1 115 kV line overload and three N-1-1 345 kV line overloads. The Boston 2028 NA Addendum identified the need for a dynamic reactive device (DRD) with 300 MVAR of capability, measured at the POI, based on system restoration needs in the Boston study area after the Mystic 8 and 9 generators are retired. The technical details of the needs can be found in:

[1] Boston 2028 RFP Documentation, Dec. 2019: https://www.iso-ne.com/static-assets/documents/2019/12/boston_2028_rfp_documents.zip

[2] ISO Response to Question 2, Boston 2028 Request for Proposals (RFP) – Response to December 4 2019 Questions memo, December 5, 2019, https://www.iso-ne.com/static-assets/documents/2019/12/boston_rfp_questions_12_04_19.pdf.

[3] Final Boston 2028 Needs Assessment Update, Oct. 2019, https://smd.iso-ne.com/operations-services/ceii/pac/2019/10/ceii_final_boston_2028_na_update.pdf

[4] Final Boston 2028 Needs Assessment Addendum, Oct. 2019, https://www.iso-ne.com/static-assets/documents/2019/10/final_boston_2028_na_addendum.pdf

[5] Non-time-sensitive needs are defined as those needs that occur greater than three years from the completion of the Needs Assessment report

- Section 5 of the Boston 2028 NA Update posted on October 17, 2019 and the Boston 2028 NA Update Appendices posted on September 24, 2019[6] on the PAC website. The Boston 2028 NA Update details the worst violation for a monitored element while the Boston 2028 NA Appendices show all of the violations for a monitored element.
- Section 3 of the Boston 2028 NA Addendum posted on October 17, 2019. The Boston 2028 NA Addendum identifies needs associated with system restoration requirements in the Boston study area post Mystic 8 and 9 retirements.

The non-time-sensitive needs identified in the Boston study area were due to the upcoming retirement of the Mystic 8 and 9 generators, and the need-by date for the solution is June 1, 2024.[7] Since a solution is required to solve reliability needs greater than three years from the time the Needs Assessment was completed (non-time sensitive need), the competitive solution process is utilized to develop and select the solution.

On December 20, 2019, the ISO issued the Boston 2028 RFP to solicit Phase One Proposals to comprehensively address the needs identified in the Boston 2028 NA Update and Boston 2028 NA Addendum. The RFP was issued to solicit competitively developed transmission solutions to solve the upcoming reliability based, non-time sensitive needs in the Boston area. The ISO identified NSTAR Electric Company and New England Power Company as the Backstop Transmission Solution providers for the Boston 2028 RFP, and these companies were required to submit a Phase One Proposal. The Phase One Proposals were due by 11 PM on March 4, 2020.

[6] Boston 2028 Needs Assessment Appendices, Sep. 2019, https://smd.iso-ne.com/operations-services/ceii/pac/2019/09/ceii_boston_2028_na_update_appendices.zip

[7] Memo to PAC and QTPSs on updated need-by-date for Boston 2028 RFP, Jan 2020: https://www.iso-ne.com/static-assets/documents/2020/01/mystic-retirement-boston-2028-final.pdf

Section 2
Phase One Proposal Review Process

2.1 Summary of Phase One Proposals Received

In response to the RFP, the ISO received 36 Phase One Proposals from eight Qualified Transmission Project Sponsors (QTPSs). To avoid potential bias during discussions at the ISO, the 36 Phase One Proposals were randomly assigned unique IDs in the form of BOS-XXX, where XXX was an odd number assigned from 001 to 071. Table 2-1 provides a translation from the unique IDs assigned by the ISO for each Phase One Proposal to the QTPS Respondent and the project name for each Phase One Proposal.

Table 2-1
Translation Table for Phase One Proposals

Proposal ID	QTPS Respondent	Project Name
BOS-001	NSTAR Electric Company	NSTAR Boston Flexible Control Project (BFCP)
BOS-003	New England Power Company	The Mystic Link - National Grid
BOS-005	Anbaric Development Partners, LLC	Anbaric Mystic Reliability AC Wind Link
BOS-007	NSTAR Electric Company	NSTAR Boston Area Smart Control (BASC)
BOS-009	Anbaric Development Partners, LLC	Anbaric Mystic Reliability DC Wind Link
BOS-011	Avangrid Networks, Inc.	Wakefield to Golden Hills Reliability Project
BOS-013	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 13
BOS-015	New England Energy Connection, LLC	New England Energy Connection, LLC (Proposal 1)
BOS-017	NSTAR Electric Company	NSTAR Boston Area Optimized Solution (BAOS)
BOS-019	Transource New England, LLC	Transource New England, LLC (Proposal 1)
BOS-021	NSTAR Electric Company	NSTAR Boston Clean Energy Connect (BCEC)
BOS-023	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 4
BOS-025	New England Energy Connection, LLC	NEEC Proposal 2
BOS-027	New England Energy Connection, LLC	NEEC Proposal 3
BOS-029	Transource New England, LLC	Proposal 2
BOS-031	New England Energy Connection, LLC	NEEC Proposal 4
BOS-033	New England Power Company	Boston Grid Expansion - National Grid
BOS-035	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 3
BOS-037	New England Energy Connection, LLC	NEEC Proposal 5
BOS-039	New England Power Company	Boston Network Reliability Project - National Grid
BOS-041	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 15
BOS-043	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 9
BOS-045	New England Power Company	Golden Hills Power Link - National Grid
BOS-047	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 12
BOS-049	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 7
BOS-051	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 2
BOS-053	SP Transmission, Inc.	SP Transmission, LLC

Proposal ID	QTPS Respondent	Project Name
BOS-055	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 5
BOS-057	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 10
BOS-059	Avangrid Networks, Inc.	Wakefield to Mystic Reliability Link
BOS-061	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 11
BOS-063	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 6
BOS-065	Transource New England, LLC	Proposal 3
BOS-067	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 1
BOS-069	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 14
BOS-071	New Hampshire Transmission, LLC	New Hampshire Transmission, LLC-Proposal 8

Note that for the remainder of the report, the proposals will be referenced using the unique Proposal IDs assigned by the ISO (BOS-XXX).

As part of the Boston 2028 RFP, the ISO required each QTPS to provide an executive summary for their Phase One Proposal. The executive summaries provided a narrative description highlighting the key project-related attributes. Appendix A displays all of the executive summaries for each Phase One Proposal.

Table 2-2 provides the in-service dates and installed cost estimates for the 36 Phase One Proposals. The in-service dates and installed cost estimates in Table 2-2 are as they have been submitted by the QTPS. The installed cost estimates provided range from approximately $49M to $745M, with in-service dates ranging from March 2023 to December 2026.

Table 2-2
Summary of Phase One Proposals

Proposal ID	In-service Date (ISD)	Installed Cost ($M)
BOS-001	10/26/2023	81
BOS-003	12/31/2023	94
BOS-005	06/01/2024	449
BOS-007	10/26/2023	58
BOS-009	06/01/2024	745
BOS-011	12/14/2023	161
BOS-013	04/15/2024	265
BOS-015	05/31/2024	218
BOS-017[8]	10/01/2023	49
BOS-019	12/17/2025	402
BOS-021	04/30/2024	119
BOS-023	05/01/2024	656
BOS-025	09/30/2023	80
BOS-027	09/30/2023	121
BOS-029	12/17/2024	267
BOS-031	02/28/2024	98

[8] BOS-017 is the Backstop Transmission Solution.

Proposal ID	In-service Date (ISD)	Installed Cost ($M)
BOS-033	12/31/2023	103
BOS-035	04/15/2024	649
BOS-037	11/30/2023	100
BOS-039	12/31/2023	121
BOS-041	04/15/2024	219
BOS-043	04/15/2024	199
BOS-045	12/31/2023	112
BOS-047	04/15/2024	254
BOS-049	04/29/2024	303
BOS-051	05/01/2024	542
BOS-053	03/01/2023	63
BOS-055	04/08/2024	264
BOS-057	04/15/2024	210
BOS-059	02/09/2024	254
BOS-061	04/29/2024	223
BOS-063	04/08/2024	258
BOS-065	12/16/2026	489
BOS-067	05/01/2024	534
BOS-069	04/15/2024	161
BOS-071	04/29/2024	182

Life-cycle costs are not shown in Table 2-2 and were not a factor in determining the competiveness of Phase One Proposals. This is because the life-cycle costs that are provided as a part of the Phase One Proposal may exclude the life-cycle costs associated with existing system upgrades, and can therefore understate the life-cycle costs of the proposal.

Section 4 of the RFP states that "*For proposed modifications to existing element(s) where the QTPS Respondent is not the PTO for the existing system element(s), the QTPS Respondent is not required to include the costs of these upgrades in establishing the life-cycle cost*". While it appears that the QTPSs have correctly followed these instructions, Phase One Proposals that include upgrades for existing system elements showed an understated life-cycle cost in the Phase One Proposal process. The total life-cycle cost, which includes PTO upgrades for the existing system, is not known until the Phase Two Solution process. For Phase One Proposals that include a significant number of upgrades to the existing system, the delta between the provided life-cycle cost and the expected life-cycle cost could be hundreds of millions of dollars.

2.2 Phase One Review Process Background

The review of Phase One Proposals can limit the number of Phase One Proposals that advance to the Phase Two Solution process. This narrowing function is intended to ensure that ratepayers are not paying for the development of projects that have no chance of success. All QTPSs' Phase Two Solution costs are eligible for cost recovery, while only those costs associated with the development of the Backstop Transmission solution are eligible for cost recovery in Phase One. See applicable language from Attachment K[9] below:

[9] All references to Attachment K in this report refer to Attachment K to the ISO Open Access Transmission Tariff (OATT) that can be found at: https://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_2/oatt/sect_ii.pdf

Cost recovery for Phase Two Solution costs as described in Attachment K, Section 4.3(i):

- *"Qualified Transmission Project Sponsors whose Phase One Proposals are listed pursuant to Section 4.3(g) for review as Phase Two Solutions shall be entitled to recover, pursuant to rates and appropriate financial arrangements set forth in the Tariff (and, as applicable, the TOA and NTDOA), all prudently incurred costs associated with developing a Phase Two Solution."*

Cost recovery for Phase One Proposal development costs by the Backstop Transmission Solution provider(s) as described in Attachment K, Section 4.3(a):

- "*A PTO or PTOs identified by the ISO as the Backstop Transmission Solution provider(s) shall submit an individual or joint Phase One Proposal (if more than one PTO is identified) as a Backstop Transmission Solution for any need identified in the request for proposal that would be solved by a project located within or connected to its/their existing electric system, and which it/they would therefore have an obligation to build under Schedule 3.09(a) of the TOA. Such PTOs may recover the costs of preparing Phase One Proposals in accordance with the mechanisms reflected in the OATT and the terms of the TOA."*

Consistent with past ISO discussions related to the Boston 2028 RFP, "cost and speed" were identified as the two most important evaluation factors for the review of the Phase One Proposals. In addition to minimizing the costs, the need for an expedited schedule was driven by the upcoming retirement date for Mystic 8 and 9 generators, which is June 1, 2024.

The importance of cost and speed were also captured in Part 1, Appendix A, "Evaluation Factors" of the RFP materials that were posted on December 20, 2019 where all of the Group 1 evaluation factors, except one, were related to cost and in-service date. The significance of cost and speed as evaluation factors was further emphasized by the statement that *"consideration of all evaluation factors, especially those in groups of lower importance, may not be necessary to make this determination".*

However, consistent with Attachment K, prior to evaluating the costs of the proposals, the ISO performed a preliminary review to ensure that each proposal addressed the identified needs and met the Tariff and RFP instructions. Most of the Phase One Proposals were excluded as a result of the preliminary review because the proposals did not address the identified needs, the proposals failed to meet the Tariff or RFP instructions, or both. It is important to note that most of the Phase One Proposals that were excluded as a part of the preliminary review were also not competitive in terms of cost. The Phase One Proposals that were not competitive in terms of cost would have been excluded on that basis alone. Figure 2-1 provides the Phase One Proposals and their installed costs, in order of ascending costs.

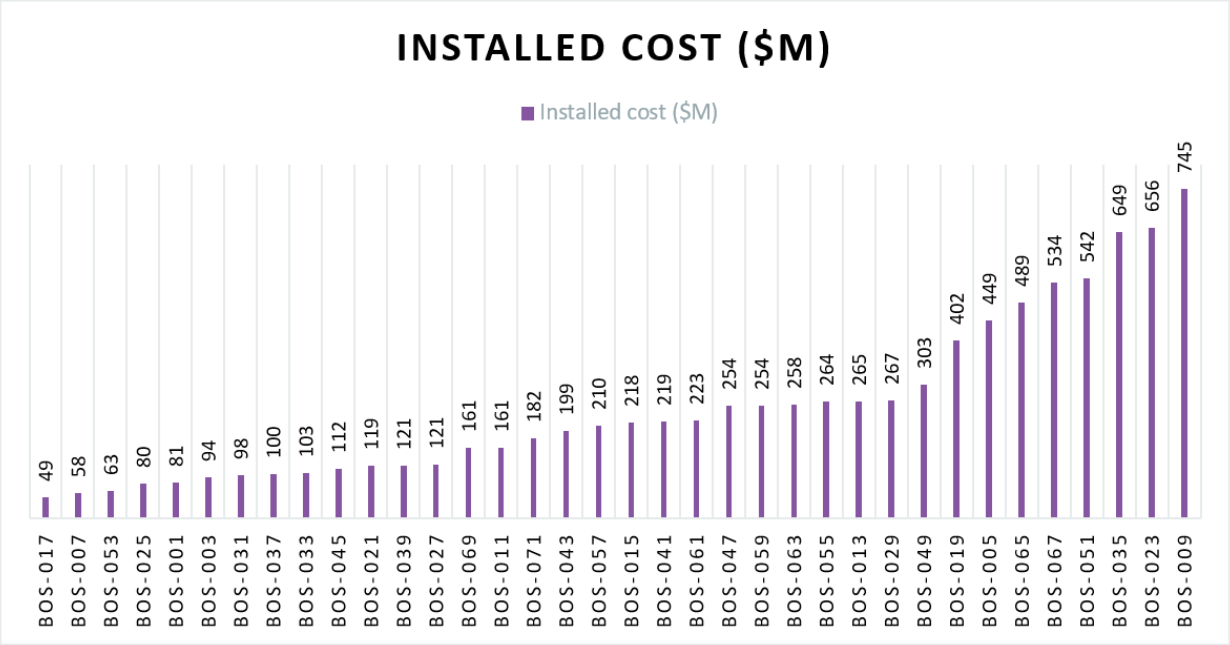


Figure 2-1: Phase One Proposals in Ascending Order of Installed Costs

2.3 Overview of the Process to Develop the Final Listing of Qualifying Phase One Proposals

The review of Phase One Proposals was divided into three steps as described in Section 4.3 of Attachment K:

- Preliminary review
- Cure of minor deficiencies and review of updated Phase One Proposals
- Competitive determination

The preliminary review was performed to:

- Exclude Phase One Proposals that do not meet the identified needs, the Tariff or the RFP instructions
- Identify Phase One Proposals with minor deficiencies

Minor deficiencies were identified in each of the Phase One Proposals that passed the preliminary review. The ISO contacted the QTPSs and gave them an opportunity to provide additional information to cure the minor deficiencies. However, as a part of this step, the QTPSs were not permitted to materially modify the project or submit a new project.

After the QTPSs provided additional information to potentially cure the minor deficiencies,[10] the updated Phase One Proposals were reviewed to:

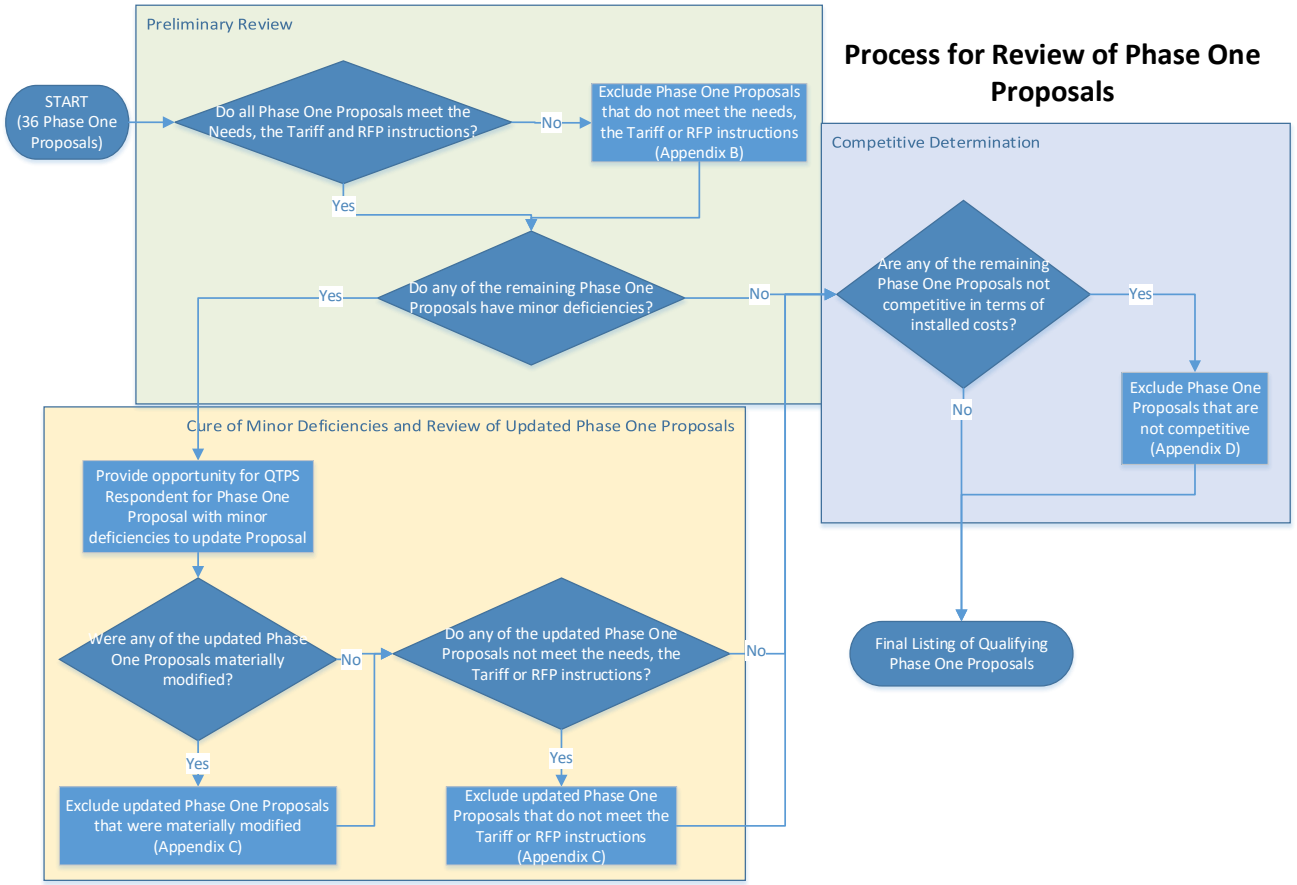
- Exclude updated Phase One Proposals that do not meet the identified needs, the Tariff or the RFP instructions

[10] After a QTPS provides additional information to cure minor deficiencies found in a Phase One Proposal, the Phase One Proposal is then referred to as an updated Phase One Proposal.

- Exclude updated Phase One Proposals that were materially modified

The final step of the Phase One Proposal review was to perform a determination of the competitiveness of the remaining Phase One Proposals. For the Boston 2028 RFP, only installed costs were utilized for this determination. Once the non-competitive Phase One Proposals were identified, the remaining Phase One Proposal(s) were included in the final listing of qualifying Phase One Proposals.

The following flowchart summarizes the process for the review of Phase One Proposals:


Process for Review of Phase One Proposals
Preliminary Review
START (36 Phase One Proposals)
Do all Phase One Proposals meet the Needs, the Tariff and RFP instructions?
No
Exclude Phase One Proposals that do not meet the needs, the Tariff or RFP instructions (Appendix B)
Yes
Do any of the remaining Phase One Proposals have minor deficiencies?
Yes
No
Competitive Determination
Are any of the remaining Phase One Proposals not competitive in terms of installed costs?
Yes
Exclude Phase One Proposals that are not competitive (Appendix D)
No
Cure of Minor Deficiencies and Review of Updated Phase One Proposals
Provide opportunity for QTPS Respondent for Phase One Proposal with minor deficiencies to update Proposal
Were any of the updated Phase One Proposals materially modified?
No
Yes
Exclude updated Phase One Proposals that were materially modified (Appendix C)
Do any of the updated Phase One Proposals not meet the needs, the Tariff or RFP instructions?
No
Yes
Exclude updated Phase One Proposals that do not meet the Tariff or RFP instructions (Appendix C)
Final Listing of Qualifying Phase One Proposals

Section 3
Preliminary Review

3.1 Preliminary Review Methodology

The objective of the preliminary review is to review each Phase One Proposal to ensure that the needs identified have been addressed and that the Tariff and RFP instructions are met. Additionally, the preliminary review identifies any minor deficiencies in the Phase One Proposals.

As a part of the preliminary review:

- Steady-state analysis was performed for each Phase One Proposal using the cases from the Boston 2028 NA Update to confirm that:
    - the thermal needs are resolved
    - no new thermal or voltage violations are caused by the Phase One Proposal, which would constitute a significant adverse impact on the system
- Short-circuit analysis was performed for each Phase One Proposal using the cases from the Boston 2028 NA Update to confirm that circuit breaker interrupting or momentary duties are within their limits
- DRD testing was performed for each Phase One Proposal to evaluate if the DRD:
    - Provides a reactive injection of -150 MVAR at the point of interconnection (POI), for voltages between 0.95 per unit (p.u.) and 1.05 p.u. at the POI
    - Provides a reactive injection of +150 MVAR at the POI, for voltages between 0.95 p.u. and 1.05 p.u. at the POI
    - Has a net charging of 40 MVAR or less associated with its interconnecting facilities between the DRD and the POI
- All Phase One Proposals were reviewed to ensure that the requirements of Attachment K, Section 4.3(e) were met:
    - This review resulted in a listing of Phase One Proposals that meet the requirements in Attachment K, Section 4.3(e)
- Additionally, all Phase One Proposals were reviewed to ensure that the Phase One Proposals do not violate the Tariff or the RFP instructions

The preliminary review did not include stability analysis or the evaluation of the remaining DRD design criteria that are not covered by the DRD testing described above. These analyses would be included in the Phase Two Solution study.

3.2 Preliminary Review Results

Testing of all 36 Phase One Proposals confirmed that all of the Proposals resolved the identified thermal needs. However, the preliminary review identified a number of issues with many of the Phase One Proposals.

The following subsections summarize the various factors that led to the ISO excluding Phase One Proposals as a part of the preliminary review. Although there were many factors used in the ISO's evaluation of the 36 Phase One Proposals, only the factors that resulted in the exclusion of a Phase One Proposal are discussed in the following subsections.

If a Phase One Proposal failed to meet one or more of the preliminary review factors, it was excluded from further consideration. However, many Phase One Proposals failed to meet more than one preliminary review factor.

The preliminary review factors are categorized as either:

- A failure to meet a specific requirement in Attachment K, Section 4.3(e)
- Not allowed under the Tariff or RFP instructions

The following subsections identify the Phase One Proposals that fail to meet each preliminary review factor. The detailed reasons for the exclusion of each Phase One Proposal as a part of the preliminary review are provided in Appendix B – Details of Phase One Proposals Excluded after Preliminary Review.

3.2.1 Preliminary Review Factor: Non-Backstop Joint Phase One Proposals

Phase One Proposals were excluded if the proposal was submitted as a joint Phase One Proposal and the Phase One Proposal is not the Backstop Transmission Solution. The Tariff and the RFP instructions do not allow a joint Phase One Proposal to be submitted by a QTPS with the exception of the Backstop Transmission Solution. A project that fails the **non-backstop joint Phase One Proposal** preliminary review factor does not meet the Tariff and the RFP instructions prohibition against joint proposals.[11,12] The relevant sections of the Tariff and RFP instructions are below.

Attachment K, Section 4.3(a) states:

- *"A Qualified Transmission Project Sponsor may propose a comprehensive solution to address the identified needs that includes an upgrade(s) located on or connected to a PTO's existing transmission system where the Qualified Transmission Project Sponsor is not the PTO for the existing system element(s)."*
- *"A PTO or PTOs identified by the ISO as the Backstop Transmission Solution provider(s) shall submit an individual or **joint** Phase One Proposal (if more than one PTO is identified) as a Backstop Transmission Solution for any need identified in the request for proposal…"*

RFP Reliability Transmission Upgrade (RTU), Part 2, Instructions for RFP Question 1.3[13]:

- *"Only the Backstop Transmission Solution may be submitted as a joint Phase One Proposal where the ISO has identified more than one Backstop Transmission Solution provider. A Phase One Proposal that is not a Backstop Transmission Solution cannot be submitted as a joint Phase One Proposal with another QTPS Respondent or Backstop Transmission Solution provider."*

[11] The topic of prohibiting multiple entities from submitting a Phase One Proposal was discussed during the July 17, 2019 joint meeting of the Reliability Committee and Transmission Committee (see slide 20 of the presentation at https://www.iso-ne.com/static-assets/documents/2019/07/a12.1_rc_tc_2019_07_17_presentation_tc.pdf and see pg. 15 of the minutes at https://www.iso-ne.com/static-assets/documents/2019/08/a00_rc_tc_2019_07_16_17_minutes.doc). One stakeholder even summarized the discussion by stating that the ISO needs "one throat to choke".

[12] ISO Response to Question 1, Boston 2028 Request for Proposals (RFP) – Response to December 4 2019 Questions memo, December 5, 2019, https://www.iso-ne.com/static-assets/documents/2019/12/boston_rfp_questions_12_04_19.pdf.

[13] See file "RTU and METU_Part 2_RFP Instructions.pdf" at: https://www.iso-ne.com/static-assets/documents/2019/12/boston_2028_rfp_documents.zip

The following three Phase One Proposals were excluded based on this preliminary review factor:

- BOS-001
- BOS-007
- BOS-021

3.2.2 Preliminary Review Factor: In-service Date

Phase One Proposals were excluded if the in-service date was beyond the need-by date of June 1, 2024.

Phase One Proposals were also excluded if they are unable to access facilities for construction to meet the need-by date of June 1, 2024.

A project that fails the **in-service date** preliminary review factor does not meet the requirement of Attachment K, Section 4.3(e)(ii). The relevant section of the Tariff is provided below.

Attachment K, Section 4.3(e)(ii) states:

- *"…the ISO shall perform a preliminary feasibility review of each proposal to determine whether the proposed solution appears to satisfy the needs described in the Needs Assessment"*

The following three Phase One Proposals were excluded based on this preliminary review factor:

- BOS-019
- BOS-029
- BOS-065

3.2.3 Preliminary Review Factor: Inadequate Dynamic Reactive Capability

Phase One Proposals were excluded if the DRD was unable to meet the following design specifications from the Boston 2028 NA Addendum:

- a reactive injection of -150 MVAR at the POI for a 0.95 to 1.05 p.u. voltage at the POI
- a reactive injection of +150 MVAR at the POI for a 0.90 to 1.05 p.u. voltage at the POI

An inability to meet these design specifications is considered a failure to satisfy the needs described in the Boston 2028 NA Addendum.

For Phase One Proposals where a high-voltage direct current (HVDC) terminal was utilized to meet the DRD requirements, the reactive injection requirements were evaluated with the HVDC line flow set to the minimum MW value that is required to meet the thermal needs.

A project that fails the **inadequate dynamic reactive capability** preliminary review factor does not meet the requirement of Attachment K, Section 4.3(e)(ii). The relevant section of the Tariff is provided below.

Attachment K, Section 4.3(e)(ii) states:

- *"…the ISO shall perform a preliminary feasibility review of each proposal to determine whether the proposed solution appears to satisfy the needs described in the Needs Assessment"*

The following 14 Phase One Proposals were excluded based on this preliminary review factor:

- BOS-005
- BOS-011
- BOS-015
- BOS-025
- BOS-027
- BOS-031
- BOS-037
- BOS-043
- BOS-049
- BOS-057
- BOS-059
- BOS-061
- BOS-069
- BOS-071

3.2.4 Preliminary Review Factor: Significant Adverse Impact

Phase One Proposals were excluded if the Phase One Proposals cause new thermal overloads in the peak load cases used for the Boston 2028 NA Update, which would be considered a significant adverse impact. This is considered a failure to meet the requirements of Section I.3.9 of the Tariff. A project that fails the **significant adverse impact** preliminary review factor does not meet the RFP instructions which state that no significant adverse impacts can be created. The relevant section of the RFP instructions is provided below.

RFP Reliability Transmission Upgrade (RTU), Part 1[514], section 4.2 states:

- *"… the ISO shall perform a preliminary feasibility review of each Phase One Proposal to determine whether the Phase One Proposal appears to satisfy the needs described in the Needs Assessment, while appearing to meet the requirements of Section I.3.9 of the Tariff"*

The following five Phase One Proposals were excluded based on this preliminary review factor:

- BOS-043
- BOS-057
- BOS-061
- BOS-069
- BOS-071

3.2.5 Preliminary Review Factor: Access to Land or Facilities

Phase One Proposals were excluded if they did not demonstrate access to the land or facilities required or the ability to procure land or access to facilities for the Phase One Proposal. A project that fails the **access to land or facilities** preliminary review factor does not meet the Attachment K, Section 4.3(e)(iii) requirement for land access. The relevant section of the Tariff is provided below.

Attachment K, Section 4.3(e)(iii) states:

- *"…the ISO shall perform a preliminary feasibility review of each proposal to determine whether the proposed solution is technically practicable and indicates possession of, or an approach to acquiring, the necessary rights of way, property and facilities that will make the proposal reasonably feasible in the required timeframe"*

[14] See file "RTU and METU_Part 1_RFP Overview.pdf" at: https://www.iso-ne.com/static-assets/documents/2019/12/boston_2028_rfp_documents.zip

The BOS-053 Phase One Proposal was excluded based on this preliminary review factor because the QTPS Respondent did not demonstrate access to or commitment to procure land for the installation of the series reactors and STATCOM.

The BOS-005 and BOS-009 Phase One Proposals were excluded based on this preliminary review factor because these Phase One Proposals utilize the non-PTF 345 kV breakers at the Mystic 8 terminal and the QTPS Respondent did not demonstrate access to these non-PTF breakers that are owned by Exelon.

3.2.6 Preliminary Review Factor: Relying on the Incumbent and/or the Incumbent's Land

Phase One Proposals were excluded if the Phase One Proposal relies on an existing PTO that is not the QTPS Respondent (incumbent[15]) or relies on the incumbent's land. Specifically, a Phase One Proposal was excluded if it:

- Violates the land ownership provisions and involves the installation of new equipment in an incumbent's right of way (ROW) or substation
- Requires the incumbent to build new facilities that are not related to the interconnection of the QTPSs proposed facility

The only permissible upgrades that the QTPS Respondent submitting the Phase One Proposal may require an incumbent to construct are:

- Upgrade(s) to existing facilities owned by an incumbent, such as increasing the size of the conductor on an overhead transmission line[16]
- Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS respondent submitting the Phase One Proposal

A project that fails the **relying on the incumbent and/or the incumbent's land** preliminary review factor does not meet Attachment K Section 4.3(e)(i), the Tariff, and the RFP instructions which do not allow a QTPS to rely on the incumbent to build new facilities or the incumbent's property. The relevant sections of the Tariff and RFP instructions are provided below.

Attachment K, Sections 4.3(a) states:

- *"A Qualified Transmission Project Sponsor may propose a comprehensive solution to address the identified needs that includes an upgrade(s) located on or connected to a PTO's existing transmission system where the Qualified Transmission Project Sponsor is not the PTO for the existing system element(s). … The Qualified Transmission Project Sponsor is not required to procure agreements with the PTO for implementation of such upgrades as the PTO is required to implement the upgrade(s) in accordance with Schedule 3.09(a) of the Transmission Operating Agreement if the proposed solution is selected through the competitive process." (emphasis added)*

[15] In this subsection, the term incumbent is used to specify an existing PTO that is not the QTPS Respondent.

[16] The topic of allowing non-incumbent QTPSs to propose upgrades to existing incumbent facilities was discussed during the July 17, 2019 joint meeting of the Reliability Committee and Transmission Committee (see slides 2, 3, 4, 11, 13 and 22 of the presentation at https://www.iso-ne.com/static-assets/documents/2019/07/a12.1_rc_tc_2019_07_17_presentation_tc.pdf and see pgs. 13 and 15 of the minutes at https://www.iso-ne.com/static-assets/documents/2019/08/a00_rc_tc_2019_07_16_17_minutes.doc).

Attachment K, Section 4.3(b), Use and Control of Right of Way states:

- *"Neither the submission of a project by a Qualified Transmission Project Sponsor nor the selection by the ISO of a project submitted by a Qualified Transmission Project Sponsor for inclusion in the RSP Project List shall alter a PTO's use and control of an existing right of way, the retention, modification, or transfer of which remain subject to the relevant law or regulation, including property or contractual rights, that granted the right-of-way. Nothing in the processes described in this Attachment K requires a PTO to relinquish any of its rights-of-way in order to permit a Qualified Transmission Project Sponsor to develop, construct or own a project."*

In the RFP, Part 2, Instructions, all references to upgrades where the QTPS Respondent is not the PTO for the element being upgraded are described as modifications to existing element(s):

- *"For proposed modifications to existing element(s) where the QTPS Respondent is not the PTO for the existing system element(s) it is the responsibility of the QTPS Respondent to provide responses, which may be based on publicly available information for the proposed upgrade."*
- *"For proposed modifications to existing element(s) where the QTPS Respondent is not the PTO for the existing system element(s) the QTPS Respondent is not required to include the costs of these upgrades in establishing the life-cycle cost." (emphasis added)*

Attachment K, Section 4.3(e)(i) states:

- *"…the ISO shall perform a preliminary feasibility review of each proposal to determine whether the proposed solution provides sufficient data and that the data is of sufficient quality to satisfy Section 4.3(c) of this Attachment"*

Attachment K, Section 4.3(c) states:

- *"Phase One Proposals shall provide the following information:*
  - (i) *a detailed description of the proposed solution, in the manner specified by the ISO, including an identification of the proposed route for the solution and technical details of the project, such as interconnection into the existing transmission system;*
  - *(ii) a detailed explanation of how the proposed solution addresses the identified need;*
  - *(iii) the proposed schedule, including key high-level milestones, for development, siting, procurement of real estate rights, permitting, construction and completion of the proposed solution;*
  - *(iv)* right, title and interest in rights of way, substations, and other property or facilities, if any, that would contribute to the proposed solution or the means and timeframe by which such would be obtained;*" (emphasis added)*

The following 22 Phase One Proposals were excluded based on this preliminary review factor:

- BOS-001
- BOS-005
- BOS-007
- BOs-009
- BOS-013
- BOS-015
- BOS-019
- BOS-021
- BOS-025
- BOS-027
- BOS-029
- BOS-031
- BOS-037
- BOS-041
- BOS-043

- BOS-047
- BOS-057
- BOS-061
- BOS-063
- BOS-065
- BOS-069
- BOS-071

3.3 Summary of Preliminary Review

At the end of the preliminary review, there were ten remaining Phase One Proposals. Table 3-1 provides the installed costs and in-service dates for the ten remaining proposals.

Table 3-1:
Remaining Phase One Proposals After Preliminary Review

Phase One Proposal	Backstop Transmission Solution	Installed Cost ($M)	In-service Date
BOS-003	No	94	12/2023
BOS-017	Yes	49	10/2023
BOS-023	No	656	05/2024
BOS-033	No	103	12/2023
BOS-035	No	649	04/2024
BOS-039	No	121	12/2023
BOS-045	No	112	12/2023
BOS-051	No	542	05/2024
BOS-055	No	264	04/2024
BOS-067	No	534	05/2024

Of the 36 Phase One Proposals evaluated, 26 Phase One Proposals were excluded based on the preliminary review. Table 3-2 provides a summary of the preliminary review of all Phase One Proposals and includes the identification of the preliminary review factors that led to the exclusion of the 26 Phase One Proposals. The detailed reasons for the exclusion of the 26 Phase One Proposals are provided in Appendix B – Details of Phase One Proposals Excluded after Preliminary Review.

While the ten remaining Phase One Proposals were not excluded based on the preliminary review, all ten remaining Phase One Proposals had minor deficiencies. The next section discusses the treatment of these minor deficiencies.

Table 3-2:
Summary of Preliminary Review of Phase One Proposals

Phase One Proposal	Non-Backstop as Joint Proposal	In-service date	Inadequate Dynamic Reactive Capability	Significant Adverse Impact	Access to Land or Facilities	Relying on the Incumbent and/or the Incumbent's Land	Passes the Preliminary Review	Count of Preliminary Review Factor Failures	Installed Cost ($M)
BOS-001	x					x		2	$81
BOS-003							Yes	0	$94
BOS-005			x		x	x		3	$449
BOS-007	x					x		2	$58
BOS-009					x	x		2	$745
BOS-011			x					1	$161
BOS-013						x		1	$265
BOS-015			x			x		2	$218
BOS-017							Yes	0	$49
BOS-019		x				x		2	$402
BOS-021	x					x		2	$119
BOS-023							Yes	0	$656
BOS-025			x			x		2	$80
BOS-027			x			x		2	$121
BOS-029		x				x		2	$267
BOS-031			x			x		2	$98
BOS-033							Yes	0	$103
BOS-035							Yes	0	$649
BOS-037			x			x		2	$100
BOS-039							Yes	0	$121
BOS-041						x		1	$219
BOS-043			x	x		x		3	$199
BOS-045							Yes	0	$112
BOS-047						x		1	$254
BOS-049			x					1	$303
BOS-051							Yes	0	$542

Phase One Proposal	Non-Backstop as Joint Proposal	In-service date	Inadequate Dynamic Reactive Capability	Significant Adverse Impact	Access to Land or Facilities	Relying on the Incumbent and/or the Incumbent's Land	Passes the Preliminary Review	Count of Preliminary Review Factor Failures	Installed Cost ($M)
BOS-053					x			1	$63
BOS-055							Yes	0	$264
BOS-057			x	x		x		3	$210
BOS-059			x					1	$254
BOS-061			x	x		x		3	$223
BOS-063						x		1	$258
BOS-065		x				x		2	$489
BOS-067							Yes	0	$534
BOS-069			x	x		x		3	$161
BOS-071			x	x		x		3	$182
Total	**3**	**3**	**14**	**5**	**3**	**22**			

Section 4
Cure of Minor Deficiencies and Review of Updated Phase One Proposals

4.1 Update of Phase One Proposals with Minor Deficiencies

Attachment K, Section 4.3(f) allows a QTPS to provide additional information to cure **minor** deficiencies in the Phase One Proposal that are identified by the ISO. However, the QTPS may not modify the project materially or submit a new project.

As a part of the preliminary review, the ISO identified minor deficiencies in Phase One Proposals. None of the preliminary review factors identified in the previous section would qualify as a minor deficiency eligible for revision. The ISO only contacted the QTPS Respondents for the remaining ten Phase One Proposals that successfully made it through the preliminary review for additional information to avoid:

- Further delays in posting of the listing of qualifying Phase One Proposals
- Adding additional expense to the QTPS for a Phase One Proposal that would not be considered for the Phase Two Solution process

On April 22, 2020, the ISO initiated the process to provide an opportunity for the QTPS Respondents to update their Phase One Proposals to cure the minor deficiencies. The ISO submitted individual questions to the applicable QTPSs through RFP360. The deadline for the QTPS responses varied depending on the date the questions were issued. The last deadline for QTPS responses was May 11, 2020 at 11:59 p.m.

4.2 Review of Updated Phase One Proposals

The review of the updated Phase One Proposals had the following objectives:

- Ensure that the updated Phase One Proposal meets the identified needs, the Tariff and the RFP instructions (common with preliminary review)
- Ensure that the original Phase One Proposal has not been materially modified as a part of the update

The following subsections summarize the various factors that led to the ISO excluding Phase One Proposals as a part of the review of updated Phase One Proposals. Although there were many factors used in the ISO's evaluation of the 10 updated Phase One Proposals, only the factors that resulted in the exclusion of a Phase One Proposal are discussed in the following subsections.

The preliminary review factors that led to the exclusion of updated Phase One Proposals are categorized as either:

- A failure to meet a specific requirement in Attachment K, Section 4.3(e)
- A failure to meet Attachment K, Section 4.3(f) because the Phase One Proposal was materially modified

The following subsections identify the updated Phase One Proposals that fail to meet each preliminary review factor. The preliminary review factors that led to the exclusion of Phase One Proposals are different from the factors discussed earlier. The detailed reasons for the exclusion of each updated Phase One Proposal during the review of the updated Phase One Proposals is provided in Appendix C – Details of Phase One Proposals Excluded after Review of Updated Phase One Proposals.

4.2.1 Review of Updated Phase One Proposals: Excess Charging Associated with DRD Interconnection

Updated Phase One Proposals were excluded if the net charging associated with the interconnecting facilities between the DRD and the POI exceeded 40 MVAR. The detailed requirements for the DRD in the Boston 2028 NA Addendum included this requirement. A project that fails the **excess charging associated with DRD interconnection** preliminary review factor does not meet the requirements of Attachment K, Section 4.3(e)(ii). The relevant section of the Tariff is provided below.

Attachment K, Section 4.3(e)(ii) states:

- *"…the ISO shall perform a preliminary feasibility review of each proposal to determine whether the proposed solution appears to satisfy the needs described in the Needs Assessment"*

The following two updated Phase One Proposals were excluded based on this preliminary review factor:

- BOS-051
- BOS-067

4.2.2 Review of Updated Phase One Proposals: Insufficient Quality of Modeling Data

Updated Phase One Proposals were excluded if the modeling data provided was of insufficient quality after the Phase One Proposal was updated to cure minor deficiencies. Specifically, if the modeling data provided for transmission facilities was outside the bounds of physically achievable parameters, the modeling data was considered to have insufficient quality. A project that fails the **insufficient quality of modeling data** preliminary review factor does not meet the requirements of Attachment K, Section 4.3(e)(i). The relevant sections of the Tariff and the Transmission Planning Process Guide are provided below.

Attachment K, Section 4.3(e)(i) states:

- *"…the ISO shall perform a preliminary feasibility review of each proposal to determine whether the proposed solution provides sufficient data and that the data is of sufficient quality to satisfy Section 4.3(c) of this Attachment"*

Attachment K, Section 4.3(c) states:

- *"Phase One Proposals shall provide the following information:*
  a detailed description of the proposed solution, in the manner specified by the ISO, including an identification of the proposed route for the solution and technical details of the project, such as interconnection into the existing transmission system"

Section 2.9.6 of the Transmission Planning Process Guide states:

- *"If the ISO identifies any minor deficiencies in the information provided as part of the Phase One Proposal, the ISO will*
    - *Notify the Phase One Proposal QTPS and provide an opportunity for the sponsor to correct the deficiencies in a time frame specified by the ISO.*
    - *Reject a Phase One Proposal if:*
        - *Clarifications are not deemed to be adequate or are not received in the specified timeframe."*

The following two updated Phase One Proposals were excluded[17] based on this preliminary review factor:

- BOS-023
- BOS-035

4.2.3 Review of Updated Phase One Proposals: Material Modification to Phase One Proposal

Updated Phase One Proposals were excluded if the Phase One Proposal was materially modified as a part of the updates to address minor deficiencies. A project that fails the **material modification to Phase One Proposal** preliminary review factor does not meet the Attachment K, Section 4.3(f) restriction against material modifications. The relevant sections of the Tariff and the Transmission Planning Process Guide are provided below.

Attachment K, Section 4.3(f) states:

- *"In providing information under this subsection (f), or in Phase Two Solutions, the Qualified Transmission Project Sponsor may not modify its project materially or submit a new project, but instead may clarify its Phase One Proposal."*

Section 2.9.6 of the Transmission Planning Process Guide states:

- *"If the ISO identifies any minor deficiencies in the information provided as part of the Phase One Proposal, the ISO will*
    - *Notify the Phase One Proposal QTPS and provide an opportunity for the sponsor to correct the deficiencies in a time frame specified by the ISO.*
    - *Reject a Phase One Proposal if:*
        - *Clarifications are not deemed to be adequate or are not received in the specified timeframe."*

The BOS-055 updated Phase One Proposal was excluded based in this preliminary review factor.

4.3 Summary of Review of Updated Phase One Proposals

The process to cure Phase One Proposal deficiencies excluded four updated Phase One Proposals based on not meeting the criteria of Attachment K, Section 4.3(e). Table 4-1 provides the details of the six Phase One Proposals that meet the criteria of Attachment K, Section 4.3(e).

[17] The line charging per mile for a 345 kV AC cable in the two updated Phase One Proposal was at least 66% lower than typical line charging per mile values for a 345 kV AC cable.

Table 4-1:
List of Phase One Proposals that meet Attachment K, Section 4.3(e)

Phase One Proposal	Backstop Transmission Solution	Installed Cost ($M)	In-service Date	Excluded in Preliminary Review	Excluded in Review of Updated Phase One Proposals
BOS-003	No	94	12/2023	No	No
BOS-017	Yes	49	10/2023	No	No
BOS-033	No	103	12/2023	No	No
BOS-039	No	121	12/2023	No	No
BOS-045	No	112	12/2023	No	No
BOS-055	No	264	04/2024	No	Yes

BOS-055 met the criteria of Section 4.3(e) but was excluded from further consideration based on not meeting Attachment K, Section 4.3(f). Therefore, only five Phase One Proposals advanced to the competitive determination step of the Phase One Proposal review. Table 4-2 provides the installed costs and in-service dates for the five remaining proposals.

Table 4-2:
Remaining Phase One Proposals After Review of Updated Phase One Proposal

Phase One Proposal	Backstop Transmission Solution	Installed Cost ($M)	In-service Date
BOS-003	No	94	12/2023
BOS-017	Yes	49	10/2023
BOS-033	No	103	12/2023
BOS-039	No	121	12/2023
BOS-045	No	112	12/2023

Of the ten updated Phase One Proposals evaluated, five updated Phase One Proposals were excluded based on the review of updated Phase One Proposals.

Table 4-3 provides a summary of the review of all updated Phase One Proposals and includes the identification of the preliminary review factors that led to the exclusion of five updated Phase One Proposals. The detailed reasons for the exclusion of the five updated Phase One Proposals is provided in Appendix C – Details of Phase One Proposals Excluded after Review of Updated Phase One Proposals.

Table 4-3:
Summary of Review of Updated Phase One Proposals

Updated Phase One Proposal	Excess Charging Associated with DRD Interconnection	Insufficient Quality of Modeling Data	Material Modification to Phase One Proposal	Passes the Review of Updated Phase One Proposals	Installed Cost ($M)
BOS-003				Yes	$94
BOS-017				Yes	$49
BOS-023		X		No	$656
BOS-033				Yes	$103
BOS-035		X		No	$649
BOS-039				Yes	$121
BOS-045				Yes	$112
BOS-051	X			No	$542
BOS-055			X	No	$264
BOS-067	X			No	$534
Total	2	2	1		

Section 5
Competitive Determination

Attachment K, Section 4.3(g) requires the exclusion of Phase One Proposals if they are not competitive with the other remaining Phase One Proposals in terms of cost, electrical performance, future expandability, or feasibility. The relevant section is provided below.

Attachment K, Section 4.3(g) states:

- *"The ISO with input from the Planning Advisory Committee may exclude projects from the list, and from consideration in Phase Two Solutions, based on a determination that the Phase One Proposal is not competitive with other projects that have been submitted in terms of cost, electrical performance, future system expandability, or feasibility"*

For the Boston 2028 RFP, installed cost was the determinant in evaluating the competitiveness of the five remaining Phase One Proposals.

The installed costs for the five remaining Phase One Proposals range from $49M to $121M. When compared to the least-cost Phase One Proposal, the next Phase One Proposal in order of increasing costs is 92% ($45M) more expensive. Therefore, the ISO is proposing to exclude four of the five Phase One Proposals based on these Phase One Proposals not being competitive in terms of installed costs.

Table 5-1:
Comparison of Installed Costs of Remaining Phase One Proposals

Phase One Proposal	Installed Cost ($M) Sorted in Ascending Order	In-service Date	
BOS-017	49	10/2023	
BOS-003	94	12/2023	
BOS-033	103	12/2023	Excluded
BOS-045	112	12/2023	
BOS-039	121	12/2023	

The exclusion of the four proposals is consistent with Section 4.3(g) of Attachment K. If these four non-competitive Phase One Proposals were not excluded, then:

- QTPS costs associated with the Phase Two Solutions for these four non-competitive proposals would be eligible for cost recovery, and
- Additional costs would be incurred during the ISO's review of the Phase Two Solutions for these four non-competitive proposals, which will include the costs of multiple consultants

Additionally, continuing with the Phase Two Solution process with the four non-competitive proposals would add at a minimum of 4 months to the process.

In summary, at the end of the competitive determination, one Phase One Proposal, BOS-017 remains.

Section 6
Final Listing of Qualifying Phase One Proposals

After excluding the Phase One Proposals that have uncompetitive installed costs, the final listing of qualifying Phase One Proposals is:

Table 6-1:
Final Listing of Qualifying Phase One Proposals

Proposal	Backstop Transmission Solution	Installed Cost ($M)	In-service Date
BOS-017	Yes	49	10/2023

The following provides some additional details on the BOS-017 Phase One Proposal:

QTPS Respondent: NSTAR Electric Company (Joint Backstop Transmission Solution submitted with New England Power Company)

Project Name: NSTAR Boston Area Optimized Solution (BAOS)

High-level description:

- Install two 11.9 ohm 345 kV series reactors at the North Cambridge substation (one each on the two Woburn to North Cambridge 345 kV cables)
- Install direct transfer trip (DTT) scheme on the 394 line to eliminate the contingency that causes the K-163 115 kV line overload
- Install +/- 167 MVAR static synchronous compensator (STATCOM) at Tewksbury 345 kV substation

Section 7
Conclusions

7.1 Summary of Review of Phase One Proposals

The review of Phase One Proposals has the potential to limit the number of Phase One Proposals that advance to the Phase Two Solution process. This narrowing function ensures that ratepayers are not paying for the development of projects that are unlikely to be selected as the winner.

As a part of the review of Phase One Proposals for the Boston 2028 RFP, the ISO utilized a three-step review process to exclude Phase One Proposals that:

- Did not address the identified needs in the Boston 2028 NA and Boston 2028 NA Addendum
- Did not meet the Tariff or RFP instructions
- Were not competitive in terms of installed costs

At the end of the three-step review process, the ISO identified one Phase One Proposal to be included in the final listing of qualifying Phase One Proposals. The BOS-017 Phase One Proposal solves the identified needs in the Boston 2028 NA and Boston 2028 NA Addendum, meets all of the Tariff and RFP instructions, and has the lowest installed cost of any of the Phase One Proposals.

Section 8
Appendix A – Redacted Executive Summaries of Phase One Proposals

final_boston_2028_rfp_review_of_phase_one_proposals_appendix_a.pdf

Section 9
Appendix B – Details of Phase One Proposals Excluded after Preliminary Review

9.1 BOS-001

QTPS Respondent: NSTAR Electric Company

High-level description:

- Create a new path into Boston
  - Close the normally open 115 kV path between the Dewar Street and North Quincy replacing the existing cables with new cross-linked polyethylene (XLPE) cables
  - Install a 115 kV Phase Angle Regulator (PAR) at Dewar Street substation to control flows on the Dewar Street to North Quincy cables

- Install two 9.5 ohm 345 kV series reactors at the North Cambridge substation (one each on the two Woburn to North Cambridge 345 kV cables)

- Install DTT scheme on the 394 line to eliminate the contingency that causes the K-163 115 kV line overload

- Install +/- 150 MVAR[18] synchronous condenser at Tewksbury 345 kV substation

In-service date: 10/26/2023

Provided installed cost estimate: $81M

Reasons for failing preliminary review:

- **Non-Backstop joint Phase One Proposal:** This Phase One Proposal is not the Backstop Transmission Solution and was submitted as a joint Phase One Proposal

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a synchronous condenser at the Tewksbury 345 kV substation. The QTPS Respondent may not rely on the incumbent for the installation of this project because this upgrade is not an:
  - Upgrade(s) to existing facilities owned by an incumbent, or
  - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

[18] The synchronous condenser was described as a +/- 150 MVAR synchronous condenser in the RFP submittal, but the modeling files submitted were for a +/- 190 MVAR synchronous condenser. The testing was performed with the +/- 190 MVAR synchronous condenser. The QTPS was not asked to cure this deficiency because the Phase One Proposal was excluded due reasons other than electrical performance

9.2 BOS-005

QTPS Respondent: Anbaric Development Partners, LLC

High-level description:

- Construct 345 kV AC transmission between SEMA (Southeastern Massachusetts) and Boston
  - Construct two 345 kV substations
    - In Plymouth, MA by looping the existing 342 and 355 lines into the new substation
    - In Everett, MA as a transition point to tie into Mystic 345 kV
  - Install two 345 kV AC underground/submarine transmission cables between the new substations each with
    - Phase Angle Regulator (PAR) to control power flow
    - Four 180 MVAR reactors for cable charging compensation
  - Install a single 345 kV cable between Everett and Mystic 345 kV

- Install 3% series reactor at the West Amesbury 115 kV substation on the K-163 line

- Install +/- 150 MVAR STATCOM at the new 345 kV substation in Everett, MA

In-service date: 06/01/2024

Provided installed cost estimate: $449M

Reasons for failing preliminary review:

- **Inadequate dynamic reactive capability:** The STATCOM is unable to provide:
  - a reactive injection of -150 MVAR at Mystic 345 kV for a 0.95 p.u. and 1.05 p.u. voltage at Mystic 345 kV

- **Access to Land or Facilities:** The Phase One Proposal reuses the non-PTF breakers at Mystic 345 kV that are owned by Exelon to interconnect Mystic 8 in the current system. The QTPS Respondent did not demonstrate access to or commitment to procure access to the non-PTF breakers for the interconnection of the Phase One Proposal.

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a series reactor at the West Amesbury 115 kV substation on the K-163 line. The QTPS Respondent may not rely on the incumbent for the installation of this upgrade because this upgrade is not an:
  - Upgrade(s) to existing facilities owned by an incumbent, or
  - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

9.3 BOS-007

QTPS Respondent: NSTAR Electric Company

High-level description:

- Create a new path into Boston

  - Close the normally open 115 kV path between the Dewar Street and North Quincy replacing the existing cables with new XLPE cables
  - Install a 115 kV PAR at Dewar Street substation to control flows on the Dewar Street to North Quincy cables
- Install two 6.5 ohm 345 kV series reactors at the North Cambridge substation (one each on the two Woburn to North Cambridge 345 kV cables)

- Install DTT scheme on the 394 line to eliminate the contingency that causes the K-163 115 kV line overload

- Install +/- 150 MVAR[19] STATCOM at Tewksbury 345 kV substation

In-service date: 10/26/2023

Provided installed cost estimate: $58M

Reasons for failing preliminary review:

- **Non-Backstop joint Phase One Proposal:** This Phase One Proposal is not the Backstop Transmission Solution and was submitted as a joint Phase One Proposal

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a STATCOM at the Tewksbury 345 kV substation. The QTPS Respondent may not rely on the incumbent for the installation of this upgrade because this upgrade is not an:
  - Upgrade(s) to existing facilities owned by an incumbent, or
  - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

9.4 BOS-009

QTPS Respondent: Anbaric Development Partners, LLC

High-level description:

- Construct HVDC transmission between SEMA and Boston
  - Construct two 345 kV substations
    - In Plymouth, MA by looping the existing 342 and 355 lines into the new substation
    - In Everett, MA as a transition point to tie into Mystic 345 kV
  - Install +/- 320 kV HVDC underground/submarine hybrid transmission line between the new substations each with a +/- 320 kV DC 1,200 MW converter station
  - Install a 345 kV cable between Everett and Mystic 345 kV

- Install 3% series reactor at the West Amesbury 115 kV substation on the K-163 line

[19] The STATCOM was described as a +/- 150 MVAR device in the RFP submittal, but the modeling files submitted were for a +/- 167 MVAR STATCOM. The testing was performed with the +/- 167 MVAR STATCOM. The QTPS was not asked to cure this deficiency because the Phase One Proposal was excluded due reasons other than electrical performance.

In-service date: 06/01/2024

Provided installed cost estimate: $745M

Reasons for failing preliminary review:

- **Access to Land or Facilities:** The Phase One Proposal reuses the non-PTF breakers at Mystic 345 kV that are owned by Exelon to interconnect Mystic 8 in the current system. The QTPS Respondent did not demonstrate access to or commitment to procure access to the non-PTF breakers for the interconnection of the Phase One Proposal.

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a series reactor at the West Amesbury 115 kV substation on the K-163 line. The QTPS Respondent may not rely on the incumbent for the installation of this upgrade because this upgrade is not an:
  - Upgrade(s) to existing facilities owned by an incumbent, or
  - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

9.5 BOS-011

QTPS Respondent: Avangrid Networks, Inc.

High-level description:

- Create a second 345 kV path between Wakefield Jct. and Mystic
  - Install a new 345 kV underground cable between Wakefield Jct. and Golden Hills
  - Separate the 349 X/Y cables between Golden Hills and Mystic
  - Connect the 349X cable to the existing 345 kV line from Golden Hills to Wakefield Jct.
  - Connect the 349Y to the new 345 kV from Golden Hills to Wakefield Jct.

- Install DTT scheme on the 394 line to eliminate the contingency that causes the K-163 115 kV line overload

- Install +/- 150 MVAR STATCOM at a new 115 kV substation that interconnects to Wakefield Jct. 115 kV substation

In-service date: 12/14/2023

Provided installed cost estimate: $161M

Reasons for failing preliminary review:

- **Inadequate dynamic reactive capability:** The STATCOM is unable to provide:
  - a reactive injection of -150 MVAR at Wakefield Junction 115 kV for a 0.95 p.u. voltage at Wakefield Junction 115 kV
  - a reactive injection of 150 MVAR at Wakefield Junction 115 kV for a 0.90 p.u. voltage at Wakefield Junction 115 kV

9.6 BOS-013

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Create a second 345 kV path between Wakefield and Mystic
  - Install a new 345 kV underground cable between Wakefield Jct. and Mystic with a PAR to control flow
- Reconductor K-163 115 kV line
- Install +/- 175 MVAR STATCOM at a new 345 kV substation that interconnects to Tewksbury 345 kV substation

In-service date: 04/15/24

Provided installed cost estimate: $265M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a 345 kV cable associated with the DRD interconnection in the incumbent's ROW. The QTPS Respondent may not rely on the incumbent for the installation of this cable because this upgrade violates the land ownership provisions and involves the installation of new equipment in an incumbent's ROW.

9.7 BOS-015

QTPS Respondent: New England Energy Connection, LLC

High-level description:

- Create a second 345 kV path between Wakefield and Mystic
  - Install a new 345 kV underground cable between Wakefield Jct. and Mystic
- Install 2% series reactor at the West Amesbury 115 kV substation on the K-163 line
- Install +/- 150 MVAR STATCOM at a new 345 kV substation that interconnects to Tewksbury 345 kV substation

In-service date: 05/31/2024

Provided installed cost estimate: $218M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a series reactor

at the West Amesbury 115 kV substation on the K-163 line. The QTPS Respondent may not rely on the incumbent for the installation of this upgrade because this upgrade is not an:
  - Upgrade(s) to existing facilities owned by an incumbent, or
  - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

- **Inadequate dynamic reactive capability:** The STATCOM is unable to provide:
  - a reactive injection of 150 MVAR at Tewksbury 345 kV for a 0.90 p.u. voltage at Tewksbury 345 kV

9.8 BOS-019

QTPS Respondent: Transource New England, LLC

High-level description:

- Create a new 345 kV path between Tewksbury and Mystic
  - Construct a new 345 kV substation adjacent to the existing Wakefield Jct. (Sunset)
  - Install a new 345 kV line between Tewksbury and Sunset (requires the existing ROW between Tewksbury and Wakefield Jct. to be reconfigured as two 345/115 kV double circuit tower (DCT) configurations)
  - Separate the 349 X/Y cables between Golden Hills and Mystic
  - Install a new 345 kV line between Sunset and Golden Hills
  - Connect the 349Y to the new 345 kV line from Golden Hills to Sunset

- Loop 339 and 349 into Sunset
  - Move the existing 339 and 349 connections at Wakefield Jct to Sunset
  - Install two new 345 kV line between Sunset and Wakefield Jct.

- Install a 345 kV series reactor at the Sunset substation
  - The series reactor separates the 339 line and the Tewksbury to Sunset line from the other elements at Sunset 345 kV substation

- Reconductor K-163 115 kV line

- Install +/- 200 MVAR STATCOM at the new Sunset 345 kV substation

In-service date: 12/17/2025

Provided installed cost estimate: $402M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a 345 kV overhead line in the incumbent's ROW and reconfigure the existing lines in the incumbent ROW. The QTPS Respondent may not rely on the incumbent for the installation of this line because this upgrade violates the land ownership provisions and involves the installation of new equipment in an incumbent's ROW.

- **In-service date:** The in-service date for the Phase One Proposal is beyond the need-by date of June 1, 2024

9.9 BOS-021

QTPS Respondent: NSTAR Electric Company

High-level description:

- Convert existing 115 kV between K Street and Kingston to 345 kV
  - Replace the existing 385-512 115 kV High Pressure Fluid Filled (HPFF) cable with new and higher rated HPFF cable
  - Install a 345 kV PAR at K Street substation to control flows on the new converted path

- Create a new path into Boston
  - Close the normally open 115 kV path between the Dewar Street and North Quincy replacing the existing cables with new XLPE cables
  - Install a 115 kV PAR at Dewar Street substation to control flows on the Dewar Street to North Quincy cables

- Install DTT scheme on the 394 line to eliminate the contingency that causes the K-163 115 kV line overload

- Install +/- 150 MVAR[20] STATCOM at Tewksbury 345 kV substation

In-service date: 04/30/2024

Provided installed cost estimate: $119M

Reasons for failing preliminary review:

- **Non-Backstop joint Phase One Proposal:** This Phase One Proposal is not the Backstop Transmission Solution and was submitted as a joint Phase One Proposal

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a STATCOM at the Tewksbury 345 kV substation. The QTPS Respondent may not rely on the incumbent for the installation of this upgrade because this upgrade is not an:
  - Upgrade(s) to existing facilities owned by an incumbent, or
  - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

9.10 BOS-025

QTPS Respondent: New England Energy Connection, LLC

[20] The STATCOM was described as a +/- 150 MVAR device in the RFP submittal, but the modeling files submitted were for a +/- 167 MVAR STATCOM. The testing was performed with the +/- 167 MVAR STATCOM. The QTPS was not asked to cure this deficiency because the Phase One Proposal was excluded due reasons other than electrical performance.

High-level description:

- Create a second 345 kV path between Wakefield Jct. and Mystic
  - Install a new 345 kV underground cable between Wakefield Jct. and Golden Hills
  - Separate the 349 X/Y cables between Golden Hills and Mystic
  - Connect the 349Y cable to the existing 345 kV line from Golden Hills to Wakefield Jct.
  - Connect the 349X to the new 345 kV from Golden Hills to Wakefield Jct.

- Install 2% series reactor at the West Amesbury 115 kV substation on the K-163 line

- Install +/- 150 MVAR STATCOM at a new 345 kV substation that interconnects to Tewksbury 345 kV substation

In-service date: 05/30/2023

Provided installed cost estimate: $80M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a series reactor at the West Amesbury 115 kV substation on the K-163 line. The QTPS Respondent may not rely on the incumbent for the installation of this upgrade because this upgrade is not an:
  - Upgrade(s) to existing facilities owned by an incumbent, or
  - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

- **Inadequate dynamic reactive capability:** The STATCOM is unable to provide:
  - a reactive injection of 150 MVAR at Tewksbury 345 kV for a 0.90 p.u. voltage at Tewksbury 345 kV

9.11 BOS-027

QTPS Respondent: New England Energy Connection, LLC

High-level description:

- Install PARs on the Tewksbury to Woburn (338) and the Tewksbury to Wakefield Jct. (339) 345 kV lines:
  - The PARs will be installed at a location adjacent to the Tewksbury 345 kV substation
  - A total of six 345 kV PARS will be installed, three each on the Tewksbury – Woburn and Tewksbury – Wakefield Jct. 345 kV lines

- Install 2% series reactor at the West Amesbury 115 kV substation on the K-163 line

- Install +/- 150 MVAR STATCOM at a new 345 kV substation that interconnects to Tewksbury 345 kV substation

In-service date: 09/30/2023

Provided installed cost estimate: $121M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a series reactor at the West Amesbury 115 kV substation on the K-163 line. The QTPS Respondent may not rely on the incumbent for the installation of this upgrade because this upgrade is not an:
  - Upgrade(s) to existing facilities owned by an incumbent, or
  - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

- **Inadequate dynamic reactive capability:** The STATCOM is unable to provide:
  - a reactive injection of 150 MVAR at Tewksbury 345 kV for a 0.90 p.u. voltage at Tewksbury 345 kV

9.12 BOS-029

QTPS Respondent: Transource New England, LLC

High-level description:

- Create a new 345 kV path into Mystic
  - Construct a new 345 kV substation adjacent to the existing Wakefield Jct. (Sunset)
  - Separate the 349 X/Y cables between Golden Hills and Mystic
  - Install a new 345 kV line between Sunset and Golden Hills
  - Connect the 349Y to the new 345 kV line from Golden Hills to Sunset

- Loop 339 and 349 into Sunset
  - Move the existing 339 and 349 connections at Wakefield Jct to Sunset
  - Install two new 345 kV line between Sunset and Wakefield Jct.

- Install a 2% 345 kV series reactor at the Sunset substation in series with the 339 line between Tewksbury and Sunset

- Install a 1.5% 345 kV series reactor at the Tewksbury 345 kV substation on the 338 line between Tewksbury and Woburn

- Reconductor K-163 115 kV line

- Install +/- 200 MVAR STATCOM at the new Sunset 345 kV substation

In-service date: 12/17/2024

Provided installed cost estimate: $267M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a series reactor at the Tewksbury 345 kV substation on the 338 line. The QTPS Respondent may not rely on the incumbent for the installation of this upgrade because this upgrade is not an:
  - Upgrade(s) to existing facilities owned by an incumbent, or

  - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

- **In-service date:** The in-service date for the Phase One Proposal is beyond the need-by date of June 1, 2024

9.13 BOS-031

QTPS Respondent: New England Energy Connection, LLC

High-level description:

- Install PARs on the two Woburn – North Cambridge 345 kV lines
  - The PARs will be installed at a location along the ROW of the Woburn to North Cambridge lines and the lines will be looped in and out of this location

- Install 2% series reactor at the West Amesbury 115 kV substation on the K-163 line

- Install +/- 150 MVAR STATCOM at a new 345 kV substation that interconnects to Tewksbury 345 kV substation

In-service date: 02/28/2024

Provided installed cost estimate: $98M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a series reactor at the West Amesbury 115 kV substation on the K-163 line. The QTPS Respondent may not rely on the incumbent for the installation of this upgrade because this upgrade is not an:
  - Upgrade(s) to existing facilities owned by an incumbent, or
  - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

- **Inadequate dynamic reactive capability:** The STATCOM is unable to provide:
  - a reactive injection of 150 MVAR at Tewksbury 345 kV for a 0.90 p.u. voltage at Tewksbury 345 kV

9.14 BOS-037

QTPS Respondent: New England Energy Connection, LLC

High-level description:

- Create a second 345 kV path between Wakefield Jct. and Mystic
  - Install a new 345 kV underground cable between Wakefield Jct. and Golden Hills
  - Separate the 349 X/Y cables between Golden Hills and Mystic
  - Connect the 349Y cable to the existing 345 kV line from Golden Hills to Wakefield Jct.
  - Connect the 349X to the new 345 kV from Golden Hills to Wakefield Jct.

- Install 2% series reactor at the West Amesbury 115 kV substation on the K-163 line

- Install two synchronous condensers with a combined capacity of +158/-175 MVAR[21] at a new 345 kV substation that interconnects to Tewksbury 345 kV substation

In-service date: 11/30/2023

Provided installed cost estimate: $100M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a series reactor at the West Amesbury 115 kV substation on the K-163 line. The QTPS Respondent may not rely on the incumbent for the installation of this upgrade because this upgrade is not an:
  - Upgrade(s) to existing facilities owned by an incumbent, or
  - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

- **Inadequate dynamic reactive capability:** The synchronous condensers based on the models provided (+/- 150 MVAR) are unable to provide:
  - a reactive injection of 150 MVAR at Tewksbury 345 kV for a 0.90 p.u. to 1.05 p.u. voltage at Tewksbury 345 kV

9.15 BOS-041

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Create a second 345 kV path between Wakefield Jct. and Mystic
  - Construct a new 345 kV underground cable between Wakefield Jct. and Mystic

- Reconductor K-163 115 kV line

- Install +/- 175 MVAR STATCOM at Tewksbury 345 kV substation

In-service date: 04/15/2024

Provided installed cost estimate: $219M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a STATCOM at

[21] The synchronous condensers were described as having a +158/-175 MVAR capability in the RFP submittal, but the modeling files submitted had a +/- 150 MVAR capability. The testing was performed with the +/- 150 MVAR capability. The QTPS was not asked to cure this deficiency because the Phase One Proposal was excluded due reasons other than electrical performance.

the Tewksbury 345 kV substation. The QTPS Respondent may not rely on the incumbent for the installation of this project because this upgrade is not an:

- Upgrade(s) to existing facilities owned by an incumbent, or
- Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

9.16 BOS-043

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Create a second 345 kV path between Wakefield Jct. and Mystic
  - Construct a new 345 kV substation adjacent to the existing Wakefield Jct. substation (Hidden Valley)
  - Install a 345 kV line from the Wakefield Jct. to Hidden Valley
  - Construct a new 345 kV overhead/underground line between Hidden Valley and Mystic with a PAR to control flow at Hidden Valley
    - Requires reconfiguration of two 115 kV lines (F-158N and Q169) to create a new DCT contingency

- Reconductor K-163 115 kV line

- Install +/- 150 MVAR STATCOM at Tewksbury 345 kV substation

In-service date: 04/15/2024

Provided installed cost estimate: $199M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:**
  - In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a STATCOM at the Tewksbury 345 kV substation. The QTPS Respondent may not rely on the incumbent for the installation of this upgrade because this upgrade is not an:
    - Upgrade(s) to existing facilities owned by an incumbent, or
    - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal
  - In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a 345 kV overhead line in the incumbent's ROW and reconfigure the existing lines in the incumbent ROW. The QTPS Respondent may not rely on the incumbent for the installation of this line because this upgrade violates the land ownership provisions and involves the installation of new equipment in an incumbent's ROW.

- **Significant adverse impact:** In this Phase One Proposal, a new DCT contingency involving the F158N and Q169 line is created. This new contingency results in new thermal overloads. This is considered a failure to satisfy the needs described in the Boston 2028 NA Update and a failure to meet the requirements of Section I.3.9 of the Tariff.

- **Inadequate dynamic reactive capability:** The STATCOM is unable to provide:
  - a reactive injection of -150 MVAR at Tewksbury 345 kV for a 0.95 p.u. voltage at Tewksbury 345 kV
  - a reactive injection of 150 MVAR at Tewksbury 345 kV for a 0.90 p.u. voltage at Tewksbury 345 kV

9.17 BOS-047

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Create a second 345 kV path between Wakefield Jct. and Mystic
  - Construct a new 345 kV substation adjacent to the Wakefield Jct. substation (Hidden Valley)
  - Construct a new 345 kV line between Wakefield Jct. and Hidden Valley
  - Construct a new 345 kV underground cable between Hidden Valley and Mystic with a Phase Angle Regulator to control flow at Hidden Valley

- Reconductor K-163 115 kV line

- Install +/- 175 MVAR STATCOM at Tewksbury 345 kV substation

In-service date: 04/15/2024

Provided installed cost estimate: $254M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a STATCOM at the Tewksbury 345 kV substation. The QTPS Respondent may not rely on the incumbent for the installation of this upgrade because this upgrade is not an:
  - Upgrade(s) to existing facilities owned by an incumbent, or
  - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

9.18 BOS-049

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Upgrade three 345 kV cables (346, 358, 365) to achieve higher ratings

- Reconductor K-163 115 kV line

- Install +/- 150 MVAR STATCOM at a new 345 kV substation that interconnects to Tewksbury 345 kV substation

In-service date: 04/29/24

Provided installed cost estimate: $303M

Reasons for failing preliminary review:

- **Inadequate dynamic reactive capability:** The STATCOM is unable to provide:
  - a reactive injection of -150 MVAR at Tewksbury 345 kV for a 0.95 p.u. voltage at Tewksbury 345 kV
  - a reactive injection of +150 MVAR at Tewksbury 345 kV for a 0.90 p.u. voltage at Tewksbury 345 kV

9.19 BOS-053

QTPS Respondent: SP Transmission, Inc.

High-level description:

- Install two 345 kV 4% series reactors on the Woburn – North Cambridge lines
  - The series reactors will be installed at a location along the ROW of the Woburn to North Cambridge lines and the lines will be looped in and out of this location

- Install a 115 kV 3% series reactor on the K-163 line
  - The series reactor will be installed at a location along the ROW of the K163 line and the lines will be looped in and out of this location

- Install +/- 165 MVAR[22] STATCOM at a new 345 kV substation that interconnects to Tewksbury 345 kV substation

In-service date: 03/01/2023

Provided installed cost estimate: $63M

Reasons for failing preliminary review:

- **Access to land:** The QTPS Respondent did not demonstrate access to or commitment to procure land for the installation of the series reactors and STATCOM

9.20 BOS-057

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Create a second 345 kV path between Wakefield Jct. and Mystic
  - Construct a new 345 kV substation adjacent to the Wakefield Jct. substation (Hidden Valley)
  - Construct a new 345 kV underground cable between Wakefield Jct. and Hidden Valley
  - Construct a new 345 kV overhead/underground line between Hidden Valley and Mystic with a PAR to control flow at Hidden Valley

[22] The STATCOM was described as having a +/- 165 MVAR STATCOM in the RFP submittal, but the modeling files submitted had a +/- 185 MVAR capability. The testing was performed with the +/- 185 MVAR capability. The QTPS was not asked to cure this deficiency because the Phase One Proposal was excluded due reasons other than electrical performance.

    - Requires reconfiguration of two 115 kV lines (F-158N and Q169) to create a new double circuit tower (DCT) contingency

- Reconductor K-163 115 kV line

- Install +/- 150 MVAR STATCOM at a new 345 kV substation that interconnects to Tewksbury 345 kV substation

In-service date: 04/15/2024

Provided installed cost estimate: $210M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a 345 kV overhead line in the incumbent's ROW and reconfigure the existing lines in the incumbent ROW. The QTPS Respondent may not rely on the incumbent for the installation of this line because this upgrade violates the land ownership provisions and involves the installation of new equipment in an incumbent's ROW.

- **Inadequate dynamic reactive capability:** The STATCOM is unable to provide:
  - a reactive injection of -150 MVAR at Tewksbury 345 kV for a 0.95 p.u. voltage at Tewksbury 345 kV
  - a reactive injection of 150 MVAR at Tewksbury 345 kV for a 0.90 p.u. voltage at Tewksbury 345 kV

- **Significant adverse impact:** In this Phase One Proposal, a new DCT contingency involving the F158N and Q169 line is created. This new contingency results in new thermal overloads. This is considered a failure to meet the requirements of Section I.3.9 of the Tariff.

9.21 BOS-059

QTPS Respondent: Avangrid Networks, Inc.

High-level description:

- Create a second 345 kV path between Wakefield Jct. and Mystic
  - Install a new 345 kV underground cable between Wakefield Jct. and Mystic

- Install DTT scheme on the 394 line to eliminate the contingency that causes the K-163 115 kV line overload

- Install +/- 150 MVAR STATCOM at a new 115 kV substation that interconnects to Wakefield Jct. 115 kV substation

In-service date: 02/09/2024

Provided installed cost estimate: $254M

Reasons for failing preliminary review:

- **Inadequate dynamic reactive capability:** The STATCOM is unable to provide:
  - a reactive injection of -150 MVAR at Wakefield Junction 115 kV for a 0.95 p.u. voltage at Wakefield Junction 115 kV
  - a reactive injection of 150 MVAR at Wakefield Junction 115 kV for a 0.90 p.u. voltage at Wakefield Junction 115 kV

9.22 BOS-061

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Create a new 345 kV path into Mystic
  - Construct a new 345 kV substation adjacent to the Wakefield Jct. substation (Hidden Valley)
  - Loop the existing Tewksbury – Wakefield Jct. 339 line into Hidden Valley
  - Construct a new 345 kV overhead/underground line between Hidden Valley and Mystic with a PAR to control flow at Hidden Valley
    - Requires reconfiguration of two 115 kV lines (F-158N and Q169) to create a new double circuit tower (DCT) contingency

- Reconductor K-163 115 kV line

- Install +/- 150 MVAR STATCOM at Hidden Valley that interconnects to Wakefield Jct. 345 kV substation

In-service date: 4/29/2024

Provided installed cost estimate: $223M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a 345 kV overhead line in the incumbent's ROW and reconfigure the existing lines in the incumbent ROW. The QTPS Respondent may not rely on the incumbent for the installation of this line because this upgrade violates the land ownership provisions and involves the installation of new equipment in an incumbent's ROW.

- **Inadequate dynamic reactive capability:** The STATCOM is unable to provide:
  - a reactive injection of -150 MVAR at Wakefield Jct. 345 kV for a 0.95 p.u. voltage at Wakefield Jct. 345 kV
  - a reactive injection of 150 MVAR at Wakefield Jct. 345 kV for a 0.90 p.u. voltage at Wakefield Jct. 345 kV

- **Significant adverse impact:** In this Phase One Proposal, a new DCT contingency involving the F158N and Q169 line is created. This new contingency results in new thermal overloads. This is considered a failure to meet the requirements of Section I.3.9 of the Tariff.

9.23 BOS-063

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Create a new controllable path from Salem Harbor 115 kV to Mystic 345 kV
  - Construct a new 345 kV/115 kV substation (South Salem) adjacent to the existing Salem 115 kV
  - Install a 115 kV line from the Salem substation to the South Salem substation
  - Install a 345/115 kV autotransformer at South Salem to interconnect the 115 kV line from Salem to South Salem
  - Install a new 345 kV underground line between South Salem and Mystic with a Phase Angle Regulator (PAR) at South Salem to control flows

- Reconductor K-163 115 kV line

- Install +/- 260 MVAR STATCOM at Tewksbury 345 kV substation

In-service date: 04/08/2024

Provided installed cost estimate: $258M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a STATCOM at the Tewksbury 345 kV substation. The QTPS Respondent may not rely on the incumbent for the installation of this upgrade because this upgrade is not an:
  - Upgrade(s) to existing facilities owned by an incumbent, or
  - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

9.24 BOS-065

QTPS Respondent: Transource New England, LLC

High-level description:

- Create a new 345 kV path between Tewksbury and Mystic
  - Construct a new 345 kV substation adjacent to the existing Wakefield Jct. (Sunset)
  - Install a new 345 kV line between Tewksbury and Sunset (requires the existing ROW between Tewksbury and Wakefield Jct. to be reconfigured as two 345/115 kV DCT's)
  - Separate the 349 X/Y cables between Golden Hills and Mystic
  - Install a new 345 kV line between Sunset and Golden Hills
  - Connect the 349Y to the new 345 kV line from Golden Hills to Sunset

- Loop 339 and 349 into Sunset
  - Move the existing 339 and 349 connections at Wakefield Jct to Sunset
  - Install two new 345 kV line between Sunset and Wakefield Jct.

- Create a new 345 kV path between Tewksbury and Woburn
  - Install a new 345 kV line between Tewksbury to Woburn (requires the existing ROW between Tewksbury to Woburn to be reconfigured as two 345/115 kV DCT's)

- Reconductor K-163 115 kV line

- Install +/- 200 MVAR STATCOM at the new Sunset 345 kV substation

In-service date: 12/26/2026

Provided installed cost estimate: $489M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:** In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install two new 345 kV overhead lines in the incumbent's ROW and reconfigure the existing lines in the incumbent ROW. The QTPS Respondent may not rely on the incumbent for the installation of this line because this upgrade violates the land ownership provisions and involves the installation of new equipment in an incumbent's ROW.

- **In-service date:** The in-service date for the Phase One Proposal is beyond the need-by date of June 1, 2024

9.25 BOS-069

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Construct a new 345 kV overhead/underground line between Wakefield Jct. and Mystic
  - Requires reconfiguration of two 115 kV lines (F-158N and Q169) to create a new double circuit tower (DCT) contingency

- Reconductor K-163 115 kV line

- Install +/- 150 MVAR STATCOM at Tewksbury 345 kV substation

In-service date: 04/15/2024

Provided installed cost estimate: $161M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:**
  - In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a STATCOM at the Tewksbury 345 kV substation. The QTPS Respondent may not rely on the incumbent for the installation of this upgrade because this upgrade is not an:
    - Upgrade(s) to existing facilities owned by an incumbent, or

        - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal
    - In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a 345 kV overhead line in the incumbent's ROW and reconfigure the existing lines in the incumbent ROW. The QTPS Respondent may not rely on the incumbent for the installation of this line because this upgrade violates the land ownership provisions and involves the installation of new equipment in an incumbent's ROW.

- **Significant adverse impact:** In this Phase One Proposal, a new DCT contingency involving the F158N and Q169 line is created. This new contingency results in new thermal overloads. This is considered a failure to meet the requirements of Section I.3.9 of the Tariff.

- **Inadequate dynamic reactive capability:** The STATCOM is unable to provide:
    - a reactive injection of -150 MVAR at Tewksbury 345 kV for a 0.95 p.u. voltage at Tewksbury 345 kV
    - a reactive injection of 150 MVAR at Tewksbury 345 kV for a 0.90 p.u. voltage at Tewksbury 345 kV

9.26 BOS-071

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Create a second 345 kV path between Wakefield Jct. and Mystic
    - Construct a new 345 kV overhead/underground line between Wakefield Jct. and Mystic
        - Requires reconfiguration of two 115 kV lines (F-158N and Q169) to create a new double circuit tower (DCT) contingency
    - Install a new 345 kV PAR at Wakefield Jct. substation to control flows on the Wakefield Jct. to Mystic line

- Reconductor K-163 115 kV line

- Install +/- 150 MVAR STATCOM at Tewksbury 345 kV substation

In-service date: 04/29/2024

Provided installed cost estimate: $182M

Reasons for failing preliminary review:

- **Relying on the Incumbent and/or the Incumbent's land:**
    - In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a STATCOM at the Tewksbury 345 kV substation and a PAR at Wakefield Junction. The QTPS Respondent may not rely on the incumbent for the installation of these upgrades because this upgrade is not an:
        - Upgrade(s) to existing facilities owned by an incumbent, or
        - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS Respondent submitting the Phase One Proposal

- In this Phase One Proposal, the QTPS Respondent requires the incumbent (not the QTPS Respondent) to install a 345 kV overhead line in the incumbent's ROW and reconfigure the existing lines in the incumbent ROW. The QTPS Respondent may not rely on the incumbent for the installation of this line because this upgrade violates the land ownership provisions and involves the installation of new equipment in an incumbent's ROW.

- **Significant adverse impact:** In this Phase One Proposal, a new DCT contingency involving the F158N and Q169 line is created. This new contingency results in new thermal overloads. This is considered a failure to meet the requirements of Section I.3.9 of the Tariff.

- **Inadequate dynamic reactive capability:** The STATCOM is unable to provide:
  - a reactive injection of -150 MVAR at Tewksbury 345 kV for a 0.95 p.u. voltage at Tewksbury 345 kV
  - a reactive injection of 150 MVAR at Tewksbury 345 kV for a 0.90 p.u. voltage at Tewksbury 345 kV

Section 10
Appendix C – Details of Phase One Proposals Excluded after Review of Updated Phase One Proposals

10.1 BOS-023

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Construct HVDC transmission link between New Hampshire and Boston
  - Construct two 345 kV HVDC converter substations
    - Seabrook converter station: Adjacent to the Seabrook 345 kV substation
    - Bennett converter station: Located in Revere, MA as a transition point from DC to AC with eventual tie into Mystic 345 kV
  - Install +/- 320 kV HVDC underground/submarine transmission line between the new substations each with +/- 320 kV 720 MW HVDC converters
  - Install a 345 kV underground transmission line from Bennett to Mystic
  - Install a 345 kV underground transmission line from Seabrook to the Seabrook converter station

- Reconductor K-163 115 kV line

In-service date: 05/01/2024

Provided installed cost estimate: $656M

Reasons for failing review of updated Phase One Proposals:

- This Phase One Proposal was excluded because the modeling data provided was of insufficient quality :
  - The line charging per mile for the two 345 kV AC cables that are a part of this Phase One Proposal was at least 66% lower than typical line charging per mile values for a 345 kV AC cable

10.2 BOS-035

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Construct HVDC transmission link between New Hampshire and Boston
  - Construct two 345 kV HVDC converter substations
    - Seabrook converter station: Adjacent to the Seabrook 345 kV substation
    - Bennett converter station: Located in Revere, MA as a transition point from DC to AC with eventual tie into Mystic 345 kV
  - Install +/- 320 kV HVDC underground/submarine transmission line between the new substations each with +/- 320 kV 720 MW HVDC converters

  - Install a 345 kV underground transmission line from Bennett to Mystic
  - Install a 345 kV underground transmission line from Seabrook to the Seabrook converter station

In-service date: 04/15/2024

Provided installed cost estimate: $649M

Reasons for failing review of updated Phase One Proposals:

- This Phase One Proposal was excluded because the modeling data provided was of insufficient quality :
  - The line charging per mile for the two 345 kV AC cables that are a part of this Phase One Proposal was at least 66% lower than typical line charging per mile values for a 345 kV AC cable

10.3 BOS-051

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Construct HVDC transmission link between New Hampshire and Boston
  - Construct two 345 kV HVDC converter substations
    - Seabrook converter station: Adjacent to the Seabrook 345 kV substation
    - Bennett converter station: Located in Revere, MA as a transition point from DC to AC with eventual tie into Mystic 345 kV
  - Install +/- 200 kV HVDC underground/submarine transmission line between the new substations each with +/- 200 kV 475 MW HVDC converters
  - Install a 345 kV underground transmission line from Bennett to Mystic
  - Install a 345 kV underground transmission line from Seabrook to the Seabrook converter station

- Reconductor K-163 115 kV line

In-service date: 05/01/2024

Provided installed cost estimate: $542M

Reasons for failing review of updated Phase One Proposals:

- This Phase One Proposal was excluded because the interconnection facilities for the DRD exceeded 40 MVAR
  - The HVDC converter at Bennett is the DRD for this Phase One Proposal
  - The net charging associated with the interconnection facilities between the HVDC terminal at Bennett and the POI at Mystic 345 kV exceeds 40 MVAR
  - The DRD requirements had specified that the net charging associated with the interconnection facilities be 40 MVAR or less

10.4 BOS-055

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Create a new controllable path from Salem Harbor 115 kV to Mystic 345 kV
  - Construct a new 345 kV/115 kV substation (South Salem) adjacent to the existing Salem 115 kV
  - Install a 115 kV line from the Salem substation to the South Salem substation
  - Install a 345/115 kV autotransformer at South Salem to interconnect the 115 kV line from Salem to South Salem
  - Install a new 345 kV underground line between South Salem and Mystic with a Phase Angle Regulator (PAR) at South Salem to control flows

- Reconductor K-163 115 kV line

- Install +/- 260 MVAR STATCOM at a new Hidden Valley 345 kV substation adjacent to Wakefield 345 kV

In-service date: 04/08/2024

Provided installed cost estimate: $264M

Reasons for failing review of updated Phase One Proposals:

- This Phase One Proposal was excluded because the Phase One Proposal was materially modified as a part of the responses to minor deficiencies:

  - A spare duct was described in the original Phase One Proposal that would not be considered a PTF facility but all installed costs were identified as PTF costs

  - This was identified as a minor deficiency and the QTPS Respondent was asked to separate the cost of the spare duct as "other" costs

  - In response, the Phase One Proposal was modified to exclude the spare duct from the Phase One Proposal

  - This modification is considered a material modification of the Phase One Proposal and therefore this Phase One Proposal was excluded

10.5 BOS-067

QTPS Respondent: New Hampshire Transmission, LLC

High-level description:

- Construct HVDC transmission link between New Hampshire and Boston
  - Construct two 345 kV HVDC converter substations
    - Seabrook converter station: Adjacent to the Seabrook 345 kV substation

    - Bennett converter station: Located in Revere, MA as a transition point from DC to AC with eventual tie into Mystic 345 kV
  - Install +/- 200 kV HVDC underground/submarine transmission line between the new substations each with +/- 200 kV 475 MW HVDC converters
  - Install a 345 kV underground transmission line from Bennett to Mystic
  - Install a 345 kV underground transmission line from Seabrook to the Seabrook converter station

In-service date: 05/01/2024

Provided installed cost estimate: $534M

Reasons for failing review of updated Phase One Proposals:

- This Phase One Proposal was excluded because the interconnection facilities for the DRD exceeded 40 MVAR
  - The HVDC converter at Bennett is the DRD for this Phase One Proposal
  - The net charging associated with the interconnection facilities between the HVDC terminal at Bennett and the POI at Mystic 345 kV exceeds 40 MVAR
  - The DRD requirements had specified that the net charging associated with the interconnection facilities be 40 MVAR or less

Section 11
Appendix D – Details of Phase One Proposals Excluded after Competitive Determination

11.1 BOS-003

QTPS Respondent: New England Power Company

High-level description:

- Create a second 345 kV path between Wakefield Jct. and Mystic
  - Install a new 345 kV overhead line between Wakefield Jct. and Golden Hills
  - Rebuild portions of the F-158N line and Q-169 line to facilitate the construction of the new 345 kV overhead line between Wakefield Jct. and Golden Hills
  - Separate the 349 X/Y cables between Golden Hills and Mystic
  - Connect the 349Y cable to the existing 345 kV line from Golden Hills to Wakefield Jct.
  - Connect the 349X to the new 345 kV from Golden Hills to Wakefield Jct.

- Install a Direct Transfer Trip (DTT) scheme on the 394 line to eliminate the contingency that causes the K-163 115 kV line overload

- Install +/- 167 MVAR STATCOM at Tewksbury 345 kV substation

In-service date: 12/31/2023

Provided installed cost estimate: $94M

Reasons for exclusion based on competitive determination:

- This Phase One Proposal was not considered to be competitive in terms of installed costs

11.2 BOS-033

QTPS Respondent: New England Power Company

High-level description:

- Create a second 345 kV path between Wakefield Jct. and Mystic
  - Install a new 345 kV overhead line between Wakefield Jct. and Golden Hills
  - Rebuild portions of the F-158N line and Q-169 line to facilitate the construction of the new 345 kV overhead line between Wakefield Jct. and Golden Hills
  - Separate the 349 X/Y cables between Golden Hills and Mystic
  - Connect the 349Y cable to the existing 345 kV line from Golden Hills to Wakefield Jct.
  - Connect the 349X to the new 345 kV from Golden Hills to Wakefield Jct.

- Reconductor K-163 115 kV line

- Install +/- 167 MVAR STATCOM at Tewksbury 345 kV substation

In-service date: 12/31/2023

Provided installed cost estimate: $103M

Reasons for exclusion based on competitive determination:

- This Phase One Proposal was not considered to be competitive in terms of installed costs

11.3 BOS-039

QTPS Respondent: New England Power Company

High-level description:

- Create a second 345 kV path between Wakefield Jct. and Mystic
  - Install a new 345 kV overhead line between Wakefield Jct. and Golden Hills
  - Rebuild portions of the F-158N line and Q-169 line to facilitate the construction of the new 345 kV overhead line between Wakefield Jct. and Golden Hills
  - Separate the 349 X/Y cables between Golden Hills and Mystic
  - Connect the 349Y cable to the existing 345 kV line from Golden Hills to Wakefield Jct.
  - Connect the 349X to the new 345 kV from Golden Hills to Wakefield Jct.

- Reconductor K-163 115 kV line

- Install +/- 190 MVAR synchronous condenser at Tewksbury 345 kV substation

In-service date: 12/31/2023

Provided installed cost estimate: $121M

Reasons for exclusion based on competitive determination:

- This Phase One Proposal was not considered to be competitive in terms of installed costs

11.4 BOS-045

QTPS Respondent: New England Power Company

High-level description:

- Create a second 345 kV path between Wakefield Jct. and Mystic
  - Install a new 345 kV overhead line between Wakefield Jct. and Golden Hills
  - Rebuild portions of the F-158N line and Q-169 line to facilitate the construction of the new 345 kV overhead line between Wakefield Jct. and Golden Hills
  - Separate the 349 X/Y cables between Golden Hills and Mystic
  - Connect the 349Y cable to the existing 345 kV line from Golden Hills to Wakefield Jct.
  - Connect the 349X to the new 345 kV from Golden Hills to Wakefield Jct.

- Install a Direct Transfer Trip (DTT) scheme on the 394 line to eliminate the contingency that causes the K-163 115 kV line overload

- Install +/- 190 MVAR synchronous condenser at Tewksbury 345 kV substation

In-service date: 12/31/2023

Provided installed cost estimate: $112M

Reasons for exclusion based on competitive determination:

- This Phase One Proposal was not considered to be competitive in terms of installed costs