



Boston 2028 RFP – Review of Phase One Proposals

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Purpose

- Discuss the methodology used to evaluate the 36 Phase One Proposals received for the Boston 2028 Request for Proposal (Boston 2028 RFP)
- Present the draft listing of qualifying Phase One Proposals for consideration in Phase Two Solutions
- Provide the explanation for the exclusion of Phase One Proposals from consideration in the Phase Two Solution process

Important Notes Regarding the Provided Information

- The in-service dates and installed cost estimates are as they have been submitted by the Qualified Transmission Project Sponsor (QTPS)
- Life-cycle costs are not shown in this presentation and, in order to level the playing field for QTPS respondents, are not a factor in determining the competitiveness of Phase One Proposals because those costs can be misleading
 - 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 show 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
 - Where a significant number of upgrades to the existing system have been included as part of the Phase One Proposal, the delta between the provided life-cycle cost and the expected life-cycle cost can be hundreds of millions of dollars

Overview

- Background
- Review Process Overview
- Preliminary review methodology
- Results of preliminary review
- Cure Phase One Proposal deficiencies
- Listing of Phase One Proposals that meet the criteria of Section 4.3(e)
- Draft listing of qualifying Phase One Proposals
- Schedule and next steps
- Appendices

BACKGROUND



Background

- On October 17, 2019, the Boston 2028 Needs Assessment (NA) Update¹ identified needs for the Boston area occurring more than 3 years in the future, which triggered the Order 1000 competitive process
 - One N-1 115 kV line overload and three N-1-1 345 kV line overloads
 - Need-by date of June 1, 2024
- On October 17, 2019, the Boston 2028 NA Addendum² identified the need for a +/- 150 MVAR dynamic reactive device (DRD) based on system restoration needs
 - Included detailed design requirements for the dynamic reactive
 - Need-by date of June 1, 2024
- On December 20, 2019, the ISO issued the Boston 2028 Request for Proposal (Boston 2028 RFP) to solicit Phase One Proposals
 - This is the first step of the two-step RFP evaluation process
 - The Phase One Proposals were due by 11 PM on March 4, 2020
- In response to the RFP, the ISO received 36 Phase One Proposals from eight QTPSs
 - The installed cost estimates provided range from approximately \$49M to \$745M, with in-service dates ranging from March 2023 to December 2026
 - To eliminate any 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

¹ https://smd.iso-ne.com/operations-services/ceii/pac/2019/10/ceii_final_boston_2028_na_update.pdf

² https://www.iso-ne.com/static-assets/documents/2019/10/final_boston_2028_na_addendum.pdf

REVIEW PROCESS OVERVIEW

To develop the draft listing of qualifying Phase One Proposals



Phase One Review Process Background

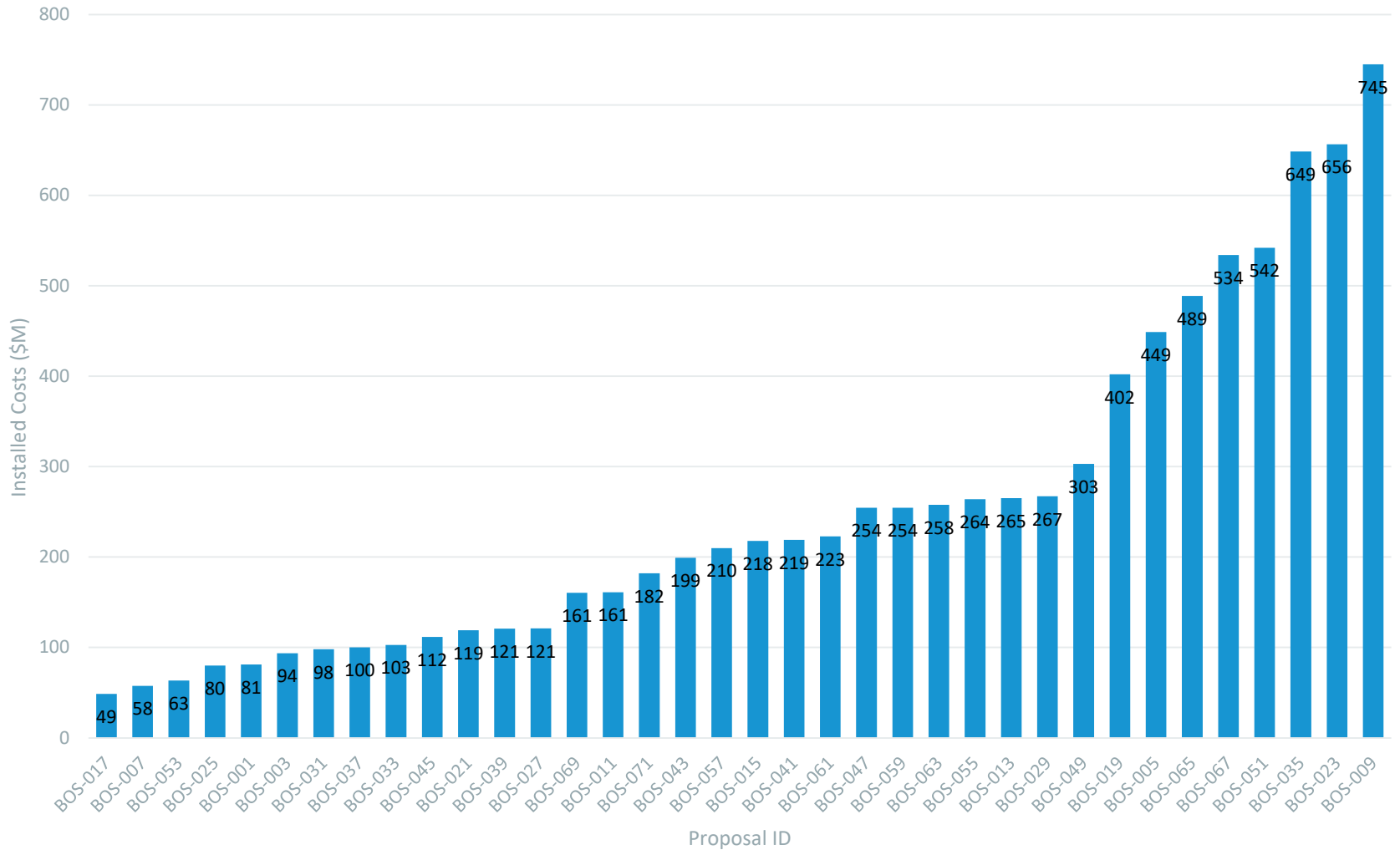
- The first phase of the two phase competitive transmission process can limit the number of Phase One Proposals that advance to the Phase Two Solution process
- This narrowing function is intended to ensure that ratepayers are not paying for the development of projects that have no chance of success
 - Cost recovery for Phase Two Solution costs are 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.”
 - In contrast to this, Section 4.3(a) of Attachment K states that cost recovery for the development of Phase One Proposals is limited to the Backstop Transmission Solution
 - “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.”

Phase One Review Process Background, cont.

- It is critical to keep in mind that the ISO repeatedly stated that the two most important evaluation factors for the Boston 2028 RFP are “cost and speed”
 - The schedule was driven by the upcoming retirement date for Mystic 8 and 9, which was most recently updated to June 1, 2024*
 - The importance of cost and speed were captured in Part 1, Appendix A, “Evaluation Factors” of the RFP materials released on December 20, 2019 where all of the Group 1 evaluation factors, except one, were related to cost and in-service date
 - This point was emphasized by the following statement:
 - “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
 - Met the Tariff and RFP instructions

*<https://www.iso-ne.com/static-assets/documents/2020/01/mystic-retirement-boston-2028-final.pdf>

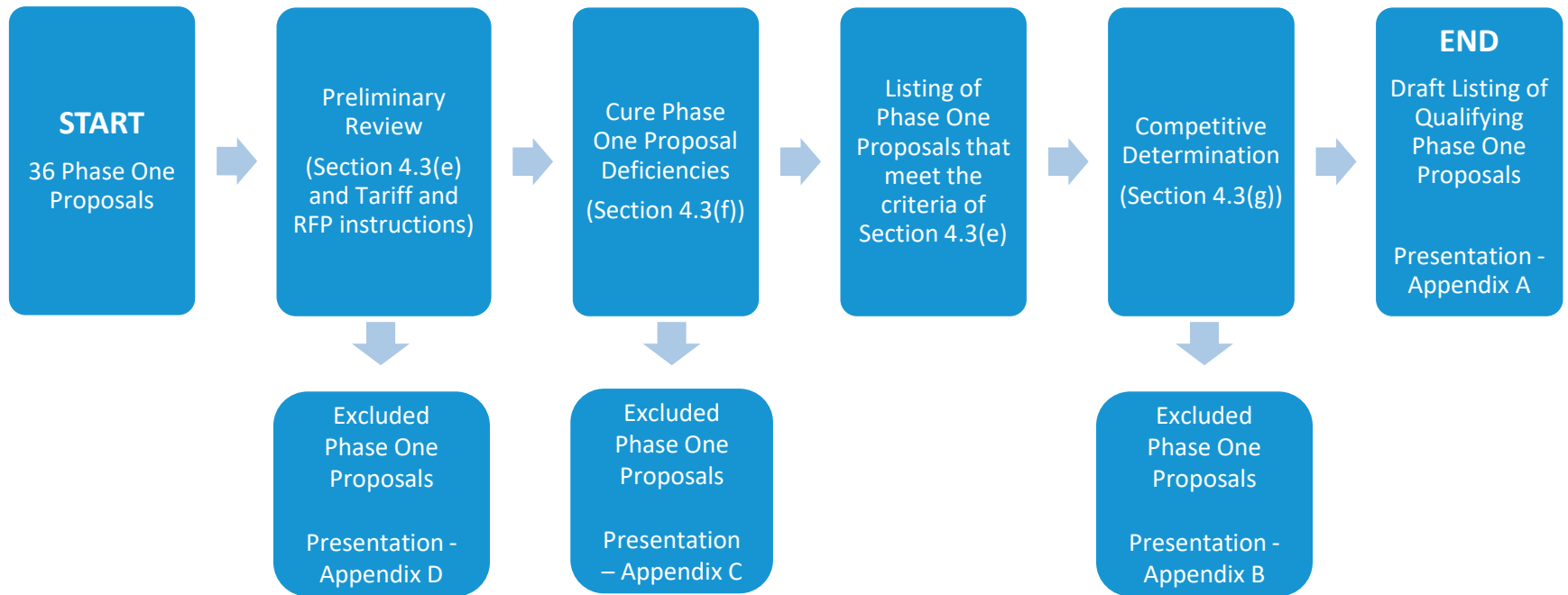
Comparison of Installed Costs of Proposals



Phase One Review Process Background, cont.

- Most of the Phase One Proposals were excluded as a result of the preliminary review because of one or both of the following:
 - The proposal did not address the identified needs
 - The proposal failed to meet the Tariff or RFP instructions
- 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 and this alone would have led to their exclusion from the draft list of qualifying Phase One Proposals
- The following slides describe the process the ISO used to develop the draft list of qualifying proposals

Overview of the Process to Develop the Draft Listing of Qualifying Phase One Proposals



PRELIMINARY REVIEW METHODOLOGY



Preliminary Review Methodology

- Steady-state analysis was performed for each Phase One Proposal included in the cases used for 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
- Short-circuit analysis was performed for each Phase One Proposal included in the cases used for the Boston 2028 NA Update to confirm that circuit breaker duties are within their limits
- Stability analysis was deferred and will be performed in the Phase Two Solution process

Preliminary Review Methodology, cont.

- Dynamic Reactive Device (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 at the POI from 0.95 p.u. to 1.05 p.u.
 - Provides a reactive injection of +150 MVAR at the POI for voltages at the POI from 0.90 p.u. to 1.05 p.u.
 - Has a net charging of 40 MVAR or less associated with its interconnecting facilities between the DRD and the POI
- The evaluation of the other DRD design criteria was deferred and will be performed in the Phase Two Solution process
- All Phase One Proposals were reviewed to ensure that the requirements of Attachment K, Section 4.3(e) were met
 - A listing of Phase One Proposals that meet the requirements in Attachment K, Section 4.3(e) was also developed
- Additionally, all Phase One Proposals were reviewed to ensure that the Phase One Proposals do not violate the Tariff or the RFP instructions

RESULTS OF PRELIMINARY REVIEW



Preliminary Review Factors

- The following slides summarize the various factors that were used by the ISO to exclude 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 which resulted in the exclusion of a Phase One Proposal are discussed in the following slides
- 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
- If a Phase One Proposal fails to meet one or more of the preliminary review factors, it was excluded from further consideration
 - Appendix D provides additional details on each Phase One Proposal including details of the preliminary review factors that are not met by each Phase One Proposal
 - Many Phase One Proposals failed to meet more than one preliminary review factors

Preliminary Review: 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
- 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...”*

Preliminary Review: Non-Backstop Joint Phase One Proposals, cont.

- RFP Reliability Transmission Upgrade (RTU), Part 2, Instructions for RFP Question 1.3³:
 - *“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.”*
- The non-backstop joint Phase One Proposal preliminary review factor is considered a failure to meet the Tariff and the RFP instructions
- Three Phase One Proposals were excluded based on this preliminary review factor

³ 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

Preliminary Review: Missing Equipment

- Phase One Proposals were excluded if the Phase One Proposal was missing a significant piece(s) of equipment
 - If the equipment was not described in the RFP360 responses and was not included in the modeling files
- Attachment K, Section 4.3(c)(i) states:
 - *“Phase One Proposals shall provide 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”*
- 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”*
- RFP Reliability Transmission Upgrade (RTU), Part 1⁴, section 1.1 states:
 - *“Phase One Proposals need to be detailed enough to demonstrate they can solve the identified needs and provide information on the project costs and logistics”*

⁴ 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

Preliminary Review: Missing Equipment, cont.

- RFP Reliability Transmission Upgrade (RTU), Part 1⁴, section 3.1 states:
 - *“Each proposal should cover the information requested in sufficient detail to permit an accurate evaluation of the proposal, including 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 missing equipment preliminary review factor is considered a failure to meet Attachment K, Section 4.3(e)(i) and a failure to meet the RFP instructions
- One Phase One Proposal was excluded based on this preliminary review factor

Preliminary Review: 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
 - The reuse of Mystic 8 terminal for interconnecting new facilities, given that Mystic 8 has an obligation through May 31, 2024 and the need-by date for the Phase One Proposals is June 1, 2024
- 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 in-service date preliminary review factor is considered a failure to meet Attachment K, Section 4.3(e)(ii)
- Five Phase One Proposals were excluded based on this preliminary review factor

Preliminary Review: Inadequate Dynamic 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 an 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
- 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 inadequate dynamic capability preliminary review factor is considered a failure to meet Attachment K, Section 4.3(e)(ii)
- 14 Phase One Proposals were excluded based on this preliminary review factor

Preliminary Review: 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 Needs Assessment 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
- RFP Reliability Transmission Upgrade (RTU), Part 1⁵, 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 significant adverse impact preliminary review factor is considered a failure to meet the RFP instructions
- Five Phase One Proposals were excluded based on this preliminary review factor

⁵ 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

Preliminary Review: Access to Land

- Phase One Proposals were excluded if they did not demonstrate access to or commitment to procure land for the Phase One Proposal
- 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”*
- The access to land preliminary review factor is considered a failure to meet Attachment K, Section 4.3(e)(iii)
- One Phase One Proposal was excluded based on this preliminary review factor

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

- Phase One Proposals were excluded if the Phase One Proposals either:
 - 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
- 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.”*

Preliminary Review: Relying on the Incumbent and/or the Incumbent's Land, cont.

- 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.”*

Preliminary Review: Relying on the Incumbent and/or the Incumbent's Land, cont.

- In summary, the only permissible upgrades that are not the responsibility of the QTPS Respondent submitting the Phase One Proposal are:
 - Upgrade(s) to existing facilities owned by an incumbent
 - Upgrade(s) built by an incumbent to interconnect facilities developed by the QTPS respondent submitting the Phase One Proposal
- The preliminary review factor associated with relying on the incumbent and/or the incumbent's land is considered a failure to meet Attachment K, Section 4.3(e)(i)
- 22 Phase One Proposals were excluded based on this preliminary review factor

Summary of Preliminary Review

Phase	Non-Backstop as Joint Proposal	Missing equipment	In-service date	Inadequate Dynamic Capability	Significant Adverse Impact	Access to Land	Relying on the Incumbent and/or the Incumbent's Land	Passes the Preliminary Review	Count of Preliminary Review Failures	Installed Cost (\$M)
BOS-001	x						x		2	\$81
BOS-003								Yes	0	\$94
BOS-005		x	x	x			x		4	\$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
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	1	5	14	5	1	22			

Summary of Preliminary Review, cont.

- Of the 36 Phase One Proposals received, ten Phase One Proposals remained after the preliminary review
- The ten Phase One Proposals are:

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	5/2024
BOS-033	No	103	12/2023
BOS-035	No	649	4/2024
BOS-039	No	121	12/2023
BOS-045	No	112	12/2023
BOS-051	No	542	5/2024
BOS-055	No	264	4/2024
BOS-067	No	534	5/2024

- While these ten Phase One Proposals were not excluded based on the preliminary review, several Phase One Proposals had minor deficiencies
 - The ten Phase One Proposals could be further reduced depending of the outcome of the cure Phase One Proposal deficiencies process

CURE PHASE ONE PROPOSAL DEFICIENCIES

Cure Phase One Proposal Deficiencies

- Attachment K, Section 4.3(f) has a provision for the 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
- The ISO only contacted the QTPS respondents for the remaining ten Phase One Proposals for additional information to avoid:
 - Further delays in posting of the draft 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
- The ISO initiated the process for curing Phase One Proposal deficiencies on April 22nd by submitting individual questions to the applicable QTPSs through RFP360
 - The deadline for the QTPS responses varied depending on the date the questions were sent out. The last deadline for a Phase One Proposal was May 11th at 11:59 p.m.

Review of Updated Phase One Proposals

- The ISO applied the preliminary review factors to the ten Phase One Proposals which were updated with the responses from the QTPSs during the cure Phase One Proposal deficiencies period
- Five updated Phase One Proposals have been excluded from further consideration
 - The preliminary review factors that led to the exclusion of the five Phase One Proposals are different from the factors discussed earlier, and are provided on the subsequent slides
- Appendix C has additional details on the Phase One Proposals that were excluded based on the review of the updated Phase One Proposals

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

- An updated Phase One Proposal was 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 had included this requirement
- 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”*
- This preliminary review factor is considered a failure to meet Attachment K, Section 4.3(e)(ii)
- Two updated Phase One Proposals were excluded based on this preliminary review factor

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

- An updated Phase One Proposal was excluded if the modeling data provided was of insufficient quality after the responses to minor deficiencies were received:
 - The modeling data provided for transmission facilities is outside the bounds of physically achievable parameters
- 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”*

Review of Updated Phase One Proposals: Insufficient Quality of Modeling Data, cont.

- 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.”*
- This preliminary review factor is considered a failure to meet Attachment K, Section 4.3(e)(i)
- For example, the line charging per mile for a 345 kV AC cable in an updated Phase One Proposal was at least 66% lower than typical line charging per mile values for a 345 kV AC cable
- Two updated Phase One Proposals were excluded based on this preliminary review factor

Review of Updated Phase One Proposals: Material Modification To Phase One Proposal

- An updated Phase One Proposal was excluded if the Phase One Proposal was materially modified as a part of the responses to minor deficiencies
- 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.”*

Review of Updated Phase One Proposals: Material Modification To Phase One Proposal, cont.

- This preliminary review factor is considered a failure to meet Attachment K, Section 4.3(f)
- One updated Phase One Proposal was excluded based on this preliminary review factor

LISTING OF PHASE ONE PROPOSALS THAT MEET THE CRITERIA OF SECTION 4.3(E)

Listing of Phase One Proposals that meet the criteria of Section 4.3(e)

- 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)
- The listing of Phase One Proposals that meet the preliminary review criteria of Section 4.3(e) is updated and shown below:

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
BOS-055	No	264	4/2024

- 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)

EXCLUSION OF NON-COMPETITIVE PHASE ONE PROPOSALS

Exclusion of Non-competitive Phase One Proposals

- Phase One Proposals were excluded if the Phase One Proposal is not competitive with other projects that have been submitted in terms of cost, electrical performance, future expandability, or feasibility
- 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”*
- The ISO only considered installed cost in evaluating the competitiveness of the five remaining Phase One Proposals

Review of Installed Costs

- The installed costs for the five remaining Phase One Proposals at the end of the cure Phase One Proposal deficiencies stage range from \$49M to \$121M
- 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

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
BOS-045	112	12/2023
BOS-039	121	12/2023

↓ Excluded

Excluding Non-competitive Proposals

- Excluding proposals that are not competitive is consistent with Section 4.3(g) of Attachment K (see slide 8 for Tariff language).
- QTPS costs associated with all Phase Two Solutions are eligible for cost recovery
- Additional costs would be incurred with the ISO's review of the Phase Two Solutions, which will include the cost of multiple consultants
- Continuing on with the Phase Two Solutions process would add at a minimum of 4 months to the process

DRAFT LISTING OF QUALIFYING PHASE ONE PROPOSALS

Draft Listing of Qualifying Phase One Proposals

- After excluding the Phase One Proposals that are not competitive in terms of cost, the draft listing of qualifying Phase One Proposals is:

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



SOLUTIONS STUDY PROCESS



Solutions Study Process

- With only one Phase One Proposal on the final listing of qualifying Phase One Proposals, Section 4.1(i) of Attachment K must be considered:
 - *“Where the ISO forecasts that a solution is needed to solve reliability criteria violations in three years or less from the completion of a Needs Assessment (unless the solution to the Needs Assessment will likely be a Market Efficiency Transmission Upgrade), and the requirements of Section 4.1(j) of this Attachment have been met or where there is only one Phase One Proposal submitted in response to a request for proposal issued under Sections 4.3(a) of this Attachment or only one proposed solution that is selected to move on as a Phase Two Solution, the ISO will evaluate the adequacy of proposed regulated solutions by performing Solutions Studies, as described in Section 4.2 of this Attachment.”*

Solutions Study Process, cont.

- Through the review of the Phase One Proposals, the ISO and its consultants have found that for BOS-017:
 - The identified needs are solved
 - The cost estimate is reasonable
 - There is no transmission line siting required
 - All real estate rights are in place
 - Limited permitting is required
 - The in-service date of October 2023 is reasonably achievable
 - Completing the selection process early increases the likelihood of meeting the proposed in-service date
- Therefore, the ISO is proposing to adopt BOS-017 as the preferred solution in the Solutions Study process

SCHEDULE AND NEXT STEPS



Schedule and Next Steps

- The ISO will collect comments on the draft listing of qualifying Phase One Proposals until July 2, 2020 (15 days)
 - Please submit comments to pacmatters@iso-ne.com
- The ISO will collect comments on the report:
 - Until July 2, 2020 if the report is posted prior to the June 17 PAC meeting
 - Until 15 days after the posting of the report if the report is posted on June 17 or later
- Post the final listing of qualifying Phase One Proposals on or before July 17, 2020

APPENDIX A

Draft Listing of Qualifying Phase One Proposals

BOS-017

- 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 +/-167 MVAR STATCOM at Tewksbury 345 kV substation
 - Install DTT scheme on the 394 line to eliminate the contingency that causes the K-163 115 kV line overload
- In-service date: 10/1/23
- Provided installed cost estimate: \$49M
- Advanced to Phase Two Solution process: Yes



APPENDIX B

Phase One Proposals Excluded Based on Being Non-competitive



BOS-003

- 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: 12/31/23
- Provided installed cost estimate: \$94M
- Advanced to Phase Two Solution process: No (Excluded based on not being cost competitive)



BOS-033

- 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: 12/31/23
- Provided installed cost estimate: \$103M
- Advanced to Phase Two Solution process: No (Excluded based on not being cost competitive)



BOS-039

- 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: 12/31/23
- Provided installed cost estimate: \$121M
- Advanced to Phase Two Solution process: No (Excluded based on not being competitive)



BOS-045

- 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 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: 12/31/23
- Provided installed cost estimate: \$112M
- Advanced to Phase Two Solution process: No (Excluded based on not being competitive)



APPENDIX C

Phase One Proposals Excluded After the Cure Phase One Proposal Deficiencies Process



BOS-023

- 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: 5/1/24
- Provided installed cost estimate: \$656M
- Advanced to Phase Two Solution process: No (Did not pass the cure Phase One Proposal deficiencies process)



BOS-023 :

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



BOS-035

- 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: 4/15/24
- Provided installed cost estimate: \$649M
- Advanced to Phase Two Solution process: No (Did not pass the cure Phase One Proposal deficiencies process)



BOS-035 :

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



BOS-051

- 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: 5/1/24
- Provided installed cost estimate: \$542M
- Advanced to Phase Two Solution process: No (Did not pass the cure Phase One Proposal deficiencies process)

BOS-051 :

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



BOS-055

- 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: 4/8/24
- Provided installed cost estimate: \$264M
- Advanced to Phase Two Solution process: No (Did not pass the cure Phase One Proposal deficiencies process)



BOS-055 :

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

BOS-067

- 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: 5/1/24
- Provided installed cost estimate: \$534M
- Advanced to Phase Two Solution process: No (Did not pass the cure Phase One Proposal deficiencies process)



BOS-067 :

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



APPENDIX D

Phase One Proposals excluded based on preliminary review factors

BOS-001

- 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
 - 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 MVAR⁶ synchronous condenser at Tewksbury 345 kV substation
- In-service date: 10/26/2023
- Provided installed cost estimate: \$81M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)

⁶ 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.



BOS-001:

Reasons for Failing Preliminary ISO 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



BOS-005

- High-level description
 - Construct 345 kV AC 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 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: 6/1/2024
- Provided installed cost estimate: \$449M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-005:

Reasons for Failing Preliminary ISO Review

- **Missing Equipment:** The modeling information and the RFP responses provided by the QTPS Respondent does not include a step up transformer from the STATCOM terminal to the new Everett 345 kV substation. The step up transformer is considered a significant piece of equipment that was missing from the Phase One Proposal.
- **Inadequate Dynamic 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



BOS-005:

Reasons for Failing Preliminary ISO Review, cont.

- In-service Date: The Phase One Proposal reuses the Mystic 8 terminal for interconnecting new facilities, and because Mystic 8 has an obligation through May 31, 2024, the ability to meet the in-service date of June 1, 2024 is not considered feasible
- 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

BOS-007

- 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
 - 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 MVAR⁷ STATCOM at Tewksbury 345 kV substation
- In-service date: 10/26/2023
- Provided installed cost estimate: \$58M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)

⁷ 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.



BOS-007:

Reasons for Failing Preliminary ISO 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

BOS-009

- 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
- In-service date: 6/1/2024
- Provided installed cost estimate: \$745M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-009:

Reasons for Failing Preliminary ISO Review

- In-service Date: The Phase One Proposal reuses the Mystic 8 terminal for interconnecting new facilities, and because Mystic 8 has an obligation through May 31, 2024, the ability to meet the in-service date of June 1, 2024 is not considered feasible
- 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

BOS-011

- 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
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-011:

Reasons for Failing Preliminary ISO Review

- Inadequate Dynamic 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



BOS-013

- 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 Phase Angle Regulator (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: 4/15/24
- Provided installed cost estimate: \$265M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-013 :

Reasons for Failing Preliminary ISO 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.



BOS-015

- 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: 5/31/2024
- Provided installed cost estimate: \$218M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-015:

Reasons for Failing Preliminary ISO 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 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



BOS-019

- 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.
 - 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
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-019:

Reasons for Failing Preliminary ISO 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.



BOS-019:

Reasons for Failing Preliminary ISO Review, cont.

- In-service Date:
 - The in-service date for the Phase One Proposal is beyond the need-by date of June 1, 2024
 - The Phase One Proposal reuses the Mystic 8 terminal for interconnecting new facilities, and because Mystic 8 has an obligation through May 31, 2024, the ability to meet the in-service date of June 1, 2024 is not considered feasible

BOS-021

- 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
 - 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 MVAR⁸ STATCOM at Tewksbury 345 kV substation
- In-service date: 4/30/2024
- Provided installed cost estimate: \$119M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)

⁸ 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.

BOS-021:

Reasons for Failing Preliminary ISO 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: 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



BOS-025

- 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: 5/30/2023
- Provided installed cost estimate: \$80M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-025:

Reasons for Failing Preliminary ISO 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 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



BOS-027

- 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: 9/30/2023
- Provided installed cost estimate: \$121M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-027:

Reasons for Failing Preliminary ISO 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 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



BOS-029

- 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
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-029:

Reasons for Failing Preliminary ISO 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



BOS-029:

Reasons for Failing Preliminary ISO Review, cont.

- In-service Date:
 - The in-service date for the Phase One Proposal is beyond the need-by date of June 1, 2024
 - The Phase One Proposal reuses the Mystic 8 terminal for interconnecting new facilities, and because Mystic 8 has an obligation through May 31, 2024, the ability to meet the in-service date of June 1, 2024 is not considered feasible

BOS-031

- 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: 2/28/2024
- Provided installed cost estimate: \$98M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)

BOS-031:

Reasons for Failing Preliminary ISO 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 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



BOS-037

- 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 MVAR⁹ at a new 345 kV substation that interconnects to Tewksbury 345 kV substation
- In-service date: 11/30/2023
- Provided installed cost estimate: \$100M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)

⁹ 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.



BOS-037:

Reasons for Failing Preliminary ISO 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 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



BOS-041

- 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: 4/15/2024
- Provided installed cost estimate: \$219M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-041:

Reasons for Failing Preliminary ISO Review

- Relying on the Incumbent: 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 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



BOS-043

- 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 double circuit tower (DCT) contingency
 - Reconductor K-163 115 kV line
 - Install +/- 150 MVAR STATCOM at Tewksbury 345 kV substation
- In-service date: 4/15/2024
- Provided installed cost estimate: \$199M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-043:

Reasons for Failing Preliminary ISO 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.



BOS-043:

Reasons for Failing Preliminary ISO Review, cont.

- 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 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



BOS-047

- 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: 4/15/2024
- Provided installed cost estimate: \$254M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-047:

Reasons for Failing Preliminary ISO 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

BOS-049

- 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: 4/29/24
- Provided installed cost estimate: \$303M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-049:

Reasons for Failing Preliminary ISO Review

- Inadequate Dynamic 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



BOS-053

- 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 MVAR¹⁰ STATCOM at a new 345 kV substation that interconnects to Tewksbury 345 kV substation
- In-service date: 3/1/2023
- Provided installed cost estimate: \$63M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)

¹⁰ 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.



BOS-053:

Reasons for Failing Preliminary ISO 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



BOS-057

- 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
 - 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: 4/15/2024
- Provided installed cost estimate: \$210M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-057:

Reasons for Failing Preliminary ISO 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 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



BOS-057:

Reasons for Failing Preliminary ISO Review, cont.

- 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.



BOS-059

- 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: 2/9/2024
- Provided installed cost estimate: \$254M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-059:

Reasons for Failing Preliminary ISO Review

- Inadequate Dynamic 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



BOS-061

- 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
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-061:

Reasons for Failing Preliminary ISO 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 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



BOS-061:

Reasons for Failing Preliminary ISO Review, cont.

- 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.



BOS-063

- 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: 4/8/2024
- Provided installed cost estimate: \$258M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-063:

Reasons for Failing Preliminary ISO 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



BOS-065

- 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
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-065:

Reasons for Failing Preliminary ISO 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.



BOS-065:

Reasons for Failing Preliminary ISO Review, cont.

- In-service Date:
 - The in-service date for the Phase One Proposal is beyond the need-by date of June 1, 2024
 - The Phase One Proposal reuses the Mystic 8 terminal for interconnecting new facilities, and because Mystic 8 has an obligation through May 31, 2024, the ability to meet the in-service date of June 1, 2024 is not considered feasible



BOS-069

- 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: 4/15/2024
- Provided installed cost estimate: \$161M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-069:

Reasons for Failing Preliminary ISO 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.



BOS-069:

Reasons for Failing Preliminary ISO Review, cont.

- 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 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



BOS-071

- 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: 4/29/2024
- Provided installed cost estimate: \$182M
- Advanced to Phase Two Solution process: No (Did not pass preliminary ISO review)



BOS-071:

Reasons for Failing Preliminary ISO 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.



BOS-071:

Reasons for Failing Preliminary ISO Review, cont.

- 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 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

