

# Boston 2028 Solutions Study – Mystic Retirement - Preliminary Preferred Solution

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*Planning Advisory Committee*



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PRINCIPAL ENGINEER



# Purpose

- Present the preliminary preferred solution for the non time-sensitive needs in the Boston study area due to the retirement of Mystic 8 and 9



# Overview

- Background
- Boston Area Optimized Solution description
- Solutions Study analysis
- Preliminary preferred solution
- Schedule and next steps



# BACKGROUND



# Background

- Boston 2028 Needs Assessment
  - October 17, 2019 – the Boston 2028 Needs Assessment (NA) Update\* and the Boston 2028 NA Addendum\*\* identified non-time sensitive needs for the Boston area, which triggered the Competitive Solutions process
    - Need-by date of June 1, 2024 based on the retirement date for Mystic 8 and 9
    - One N-1 115 kV line overload and three N-1-1 345 kV line overloads
    - A dynamic reactive device (DRD) based on system restoration needs
- Boston 2028 Competitive Solutions Process
  - December 20, 2019 – the ISO issued the Boston 2028 Request for Proposal (Boston 2028 RFP) to solicit Phase One Proposals
  - March 4, 2020 – in response to the Boston 2028 RFP, the ISO received 36 Phase One Proposals from 8 QTPSs
  - July 17, 2020 – the ISO posted the Final Boston 2028 Review of Phase One Proposals\*\*\*:
    - The ISO identified one Phase One Proposal, the Boston Area Optimized Solution (BAOS#), to be included in the final listing of qualifying Phase One Proposals
    - The BAOS resolved all the identified needs, met the Tariff and RFP instructions, met the required in-service date, and had the lowest installed cost

\* [https://smd.iso-ne.com/operations-services/ceii/pac/2019/10/ceii\\_final\\_boston\\_2028\\_na\\_update.pdf](https://smd.iso-ne.com/operations-services/ceii/pac/2019/10/ceii_final_boston_2028_na_update.pdf)

\*\* [https://www.iso-ne.com/static-assets/documents/2019/10/final\\_boston\\_2028\\_na\\_addendum.pdf](https://www.iso-ne.com/static-assets/documents/2019/10/final_boston_2028_na_addendum.pdf)

\*\*\* [https://www.iso-ne.com/static-assets/documents/2020/07/final\\_boston\\_2028\\_rfp\\_review\\_of\\_phase\\_one\\_proposals.pdf](https://www.iso-ne.com/static-assets/documents/2020/07/final_boston_2028_rfp_review_of_phase_one_proposals.pdf)

# BAOS has also previously been referred to as BOS-017.

# Background, cont.

- Boston 2028 Solutions Study – Mystic Retirement
  - July 17, 2020 – the ISO posted the notice of initiation\* of the Boston 2028 Solutions Study – Mystic Retirement:
    - Given that the BAOS was the only Phase One Proposal that was selected to move on as a Phase Two solution, the ISO determined that, consistent with Section 4.1.(i) of Attachment K of the Tariff, the Solutions Study process will be utilized

\* [https://www.iso-ne.com/static-assets/documents/2020/07/pac\\_memo\\_final\\_boston\\_2028\\_rfp\\_review\\_of\\_phase\\_one\\_proposals\\_report\\_and\\_notice\\_of\\_information.pdf](https://www.iso-ne.com/static-assets/documents/2020/07/pac_memo_final_boston_2028_rfp_review_of_phase_one_proposals_report_and_notice_of_information.pdf)

# BAOS DESCRIPTION



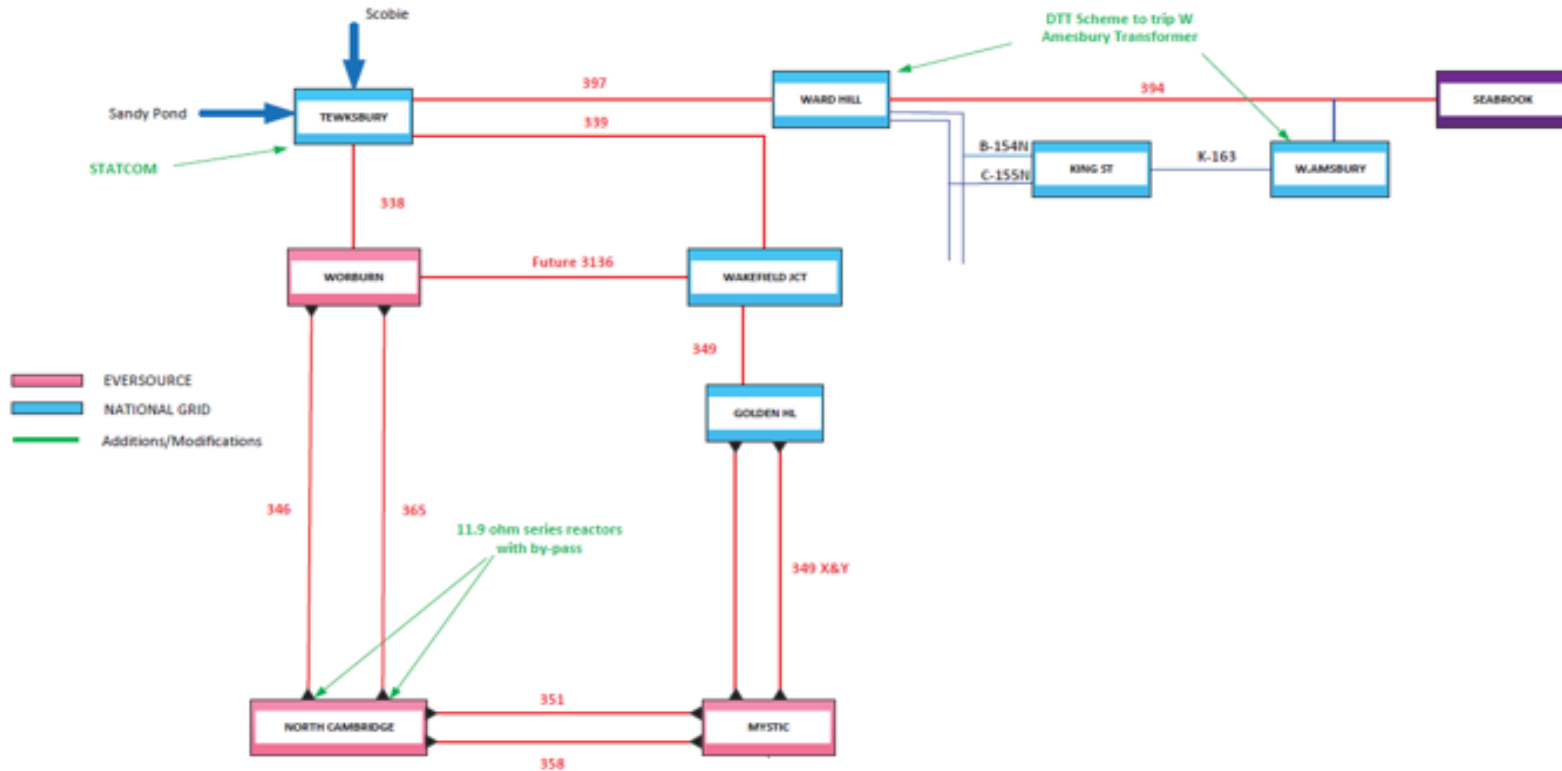
# BAOS Description

- The BAOS high-level description is summarized as follows:
  - 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)
    - A normally-closed bypass breaker will be installed in parallel with each series reactor and will only be opened when there is a need to switch in the reactor(s)
  - Install direct transfer trip (DTT) scheme on the 394 line to address the contingency that causes the K-163 115 kV line overload
  - Install +/- 167 MVAR static synchronous compensator (STATCOM) at Tewksbury 345 kV substation
- The BAOS has an installed cost of \$48.6 M and a proposed in-service date of October 2023





# BAOS One-Line Diagram Overview



# SOLUTIONS STUDY ANALYSIS



# Analysis Performed as a part of the Review of Phase One Proposals

- The technical analysis performed as a part of the Boston 2028 Review of Phase One Proposals included steady-state analysis, short-circuit analysis and dynamic reactive device testing
- Steady-state analysis was performed with the BAOS included in the cases used for the Boston 2028 NA Update:
  - the thermal needs were resolved\*
  - no new thermal or voltage violations were caused by the BAOS
- Short-circuit analysis was performed with the BAOS included in the cases used for the Boston 2028 NA Update:
  - All area circuit breaker duties were within their limits
- Dynamic Reactive Device (DRD) testing was performed for the BAOS. The proposed STATCOM at Tewksbury meets the following requirements of the DRD:
  - Provides a reactive injection of -150 MVAR at Tewksbury 345 kV for voltages from 0.95 p.u. to 1.05 p.u. at Tewksbury 345 kV
  - Provides a reactive injection of +150 MVAR at Tewksbury 345 kV for voltages from 0.90 p.u. to 1.05 p.u. at Tewksbury 345 kV
  - Has a net charging of 40 MVAR or less associated with its interconnecting facilities between the STATCOM and Tewksbury 345 kV

\* The results of the Boston 2028 NA Update did not identify any voltage needs



# PRELIMINARY PREFERRED SOLUTION



# Preliminary Preferred Solution

- The Boston 2028 Solutions Study – Mystic Retirement, adopts the analysis performed as a part of the Boston 2028 RFP Review of Phase One Proposals
- As a part of the review of Phase One Proposals, the ISO and its consultants found that for the BAOS:
  - All identified needs are resolved
  - 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
- The BAOS is selected as the preliminary preferred solution for the Boston 2028 Solutions Study – Mystic Retirement

# Preliminary Preferred Solution Cost Summary

BAOS Component	Installed Cost Estimate Reported in \$M at +10/-10% Accuracy <sup>6</sup>
Install two 11.9 ohm 345 kV series reactors at the North Cambridge substation	14.4
Install direct transfer trip (DTT) scheme on the 394 line	0.8
Install +/- 167 MVAR static synchronous compensator (STATCOM) at Tewksbury 345 kV substation	33.4
<b>Preliminary Preferred Solution Total in \$M</b>	<b>48.6</b>

- During the June 17, 2020 PAC meeting, Eversource and National Grid stated they would honor the cost containment proposal submitted with the BAOS proposal
- The cost containment proposal details are as follows:
  - Eversource and National Grid are proposing return on equity (ROE) reductions if the companies exceed \$48.6 million of installed cost of the BAOS (the “Cost Cap”). If the Cost Cap is exceeded by more than 5%, the ROE for that increment will be reduced by 25 basis points. The ROE will continue to be reduced by 25 basis points for each incremental 5% overrun

<sup>6</sup> Typically an accuracy of +50/-25% is used for solution alternatives in a Solutions Study.

# SCHEDULE AND NEXT STEPS



# Schedule and Next Steps

- The ISO will collect comments on the draft Boston 2028 Solutions Study – Mystic Retirement report:
  - Until Friday, September 11, 2020 if the report is posted prior to the August 27 PAC meeting
  - Until 15 days after the posting of the report if the report is posted on August 27 or later
- Please submit comments on the draft Solutions Study report to [pacmatters@iso-ne.com](mailto:pacmatters@iso-ne.com)



# Questions

