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December 22, 2010

**VIA ELECTRONIC FILING**

The Honorable Kimberly D. Bose, Secretary  
The Honorable Nathaniel J. Davis, Sr., Deputy Secretary  
Federal Energy Regulatory Commission  
Room 1A-East, First Floor  
888 First Street, N.E.  
Washington, D.C. 20426

**Re: ISO New England Inc., Docket No. ER10-2477-000  
Compliance Filing**

Dear Ms. Bose and Mr. Davis:

Pursuant to Rule 1907 of the Rules of Practice and Procedure of the Federal Energy Regulatory Commission (“FERC” or “Commission”), 18 C.F.R. § 385.1907 (2010), and the Order issued by the Commission on December 16, 2010,<sup>1</sup> ISO New England Inc. (the “ISO”) hereby submits this compliance filing. While the December 16 Order accepted the results of the fourth Forward Capacity Auction (“FCA”), the Commission required the ISO to make a compliance filing within 60 days that identifies the alternatives to resolve the reliability need for Salem Harbor Units 3 and 4 and the time frame to implement those solutions.<sup>2</sup> As explained herein, reliability needs in the Greater Boston area, including the Salem Harbor Station, have been evaluated for more than a year through the FERC-approved planning process. The ISO, through the regional planning process, has also evaluated alternatives to those reliability needs and presented preliminary preferred alternatives to stakeholders on December 16, 2010. The ISO is making this filing in compliance with the December 16 Order and submitting to the Commission the work that it has already shared with stakeholders.<sup>3</sup>

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<sup>1</sup> *Order on Forward Capacity Auction Results Filing*, 133 FERC ¶ 61,230 (2010) (“December 16 Order”).

<sup>2</sup> December 16 Order at P 30.

<sup>3</sup> The December 16 Order noted the protest by Conservation Law Foundation (“CLF”) citing to Section III.13.2.5.2.5(g) whereby the ISO would identify solutions to allow for a de-list bid to clear and the time frame to implement such alternatives. Section III.13.2.5.2.5(g), however, does not require the development of detailed engineering projects or moving forward with any identified alternative. In other words, it is an information requirement only. The ISO, however, notified NEPOOL Reliability Committee members, which include CLF, that detailed work was underway pursuant to the FERC-approved regional planning process. In response to the CLF protest, the December 16 Order directed the ISO to submit the informational requirements of Section III.13.2.5.2.5(g) to the Commission. It is important to note that detailed engineering study and project development has been on-going over a period stretching back

## **I. BACKGROUND**

On August 30, 2010, pursuant to Section 205 of the Federal Power Act (“FPA”)<sup>4</sup> and Section III.13.8.2 of the Tariff, the ISO submitted the FCA Results Filing for the fourth FCA.<sup>5</sup> As discussed in the testimony of Stephen Rourke, attached to that filing, the ISO rejected two Static De-List Bids submitted by Dominion Resources Services, Inc. (“Dominion”) for Salem Harbor Units 3 and 4 (“Salem Harbor 3 and 4”), which are located in the Northeast Massachusetts and Boston (“NEMA”) Load Zone. The one-year Static De-List Bids submitted by Dominion were for the 2013-2014 Capacity Commitment Period. The Commission approved the ISO’s reliability determination for Salem Harbor 3 and 4 in the December 16 Order. In that Order, however, the Commission directed the ISO to make a compliance filing identifying an alternative to the reliability need for Salem Harbor 3 and 4 and the timing to implement the alternative.

## **II. IDENTIFICATION OF ALTERNATIVES AND TIMING TO ALLEVIATE IDENTIFIED SALEM HARBOR RELIABILITY NEEDS**

Pursuant to the open and transparent FERC-approved planning process set out in the ISO Tariff,<sup>6</sup> the ISO has studied a regulated transmission alternative to the identified reliability need for the Salem Harbor Station for over a year. In 2008, a study group led by the ISO, with representatives from NSTAR, Northeast Utilities, and National Grid, conducted a study of the Greater Boston system in 2018 (“Greater Boston Needs Assessment”). The results of the Greater Boston Needs Assessment were presented to the Planning Advisory Committee (“PAC”) on March 18, 2010 and a finalized study report was posted to the ISO New England website on July 9, 2010.<sup>7</sup>

In the Greater Boston Needs Assessment, sensitivity conditions were tested that modeled the retirement of Salem Harbor Station. With the Salem Harbor Station sensitivity, the Greater Boston Needs Assessment showed additional thermal overloads under N-1 and N-1-1 contingencies.

For the fifth FCA, scheduled to be held on June 6, 2011, Dominion has recently submitted a Permanent De-List Bid for the Salem Harbor Station, which was posted on the ISO website on October 6, 2010.<sup>8</sup> Because Dominion has requested to permanently retire Salem Harbor Station from the Forward Capacity Market, the ISO changed the modeling of the Salem Harbor Station retirement from a sensitivity to part of the fundamental design case in the Greater Boston Needs Assessment.

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beyond 2010, pursuant to the regional planning process. As the result of that work, the ISO shared alternatives solutions with stakeholders on December 16, 2010.

<sup>4</sup> 16 U.S.C. §824d (2006).

<sup>5</sup> Forward Capacity Results Filing, filed on August 30, 2010 in Docket No. ER10-2477-000.

<sup>6</sup> See Attachment K of Section II of the Tariff.

<sup>7</sup> The Greater Boston Area Transmission Needs Assessment is posted at the following link: [http://www.iso-ne.com/committees/comm\\_wkgrps/prtcpts\\_comm/pac/reports/index-p1.html](http://www.iso-ne.com/committees/comm_wkgrps/prtcpts_comm/pac/reports/index-p1.html).

<sup>8</sup> [http://www.iso-ne.com/markets/hstdata/mkt\\_offer\\_bid/fcm\\_bids/delist\\_bids\\_for\\_fca\\_2014\\_2015.pdf](http://www.iso-ne.com/markets/hstdata/mkt_offer_bid/fcm_bids/delist_bids_for_fca_2014_2015.pdf).

The ISO is also working with the study group to develop a regulated transmission solutions study (“Solutions Study”) to meet the needs identified in the Greater Boston Needs Assessment. The ISO presented several solution options at the March 18, 2010 PAC meeting. Similar to the Greater Boston Needs Assessment, the Solutions Study originally considered the retirement of Salem Harbor Station as a sensitivity. With the submission of the Permanent De-List Bid, however, the ISO has planned for the retirement of Salem Harbor Station in the design case. In other words, the Solutions Study is designed to alleviate the identified reliability need for the Salem Harbor Station. The ISO presented a preliminary analysis of the Solutions Study to the PAC on December 16, 2010 (“December 16 Presentation”). This presentation identifies alternatives under consideration to address the reliability needs associated with the Permanent-De-List Bid submitted by Dominion this last October, and a public version of the presentation is attached to this filing as **Attachment A**.

The Greater Boston Needs Assessment identified eight smaller sub-areas within the Boston area. These eight sub-areas were regrouped into three areas for the Solution Study: North, South and Central. The North consists of the 345 kV and 115 kV system between the New Hampshire border and downtown Boston, including the North Shore of Massachusetts. The South area consists of the area south of Boston included in the Southeast Massachusetts Load Zone. The Central area is comprised of the downtown Boston 345 kV and 115 kV underground cable system and the suburban areas west of Boston. Because of the interdependencies of these areas and in order to develop cost-effective and efficient solutions, the study group is developing comprehensive solutions to the identified reliability need in all three areas. The study group has identified preliminary preferred solutions in the North and South areas. While the Central area requires additional testing prior to identifying a preferred solution, the study group is evaluating transmission solutions that include new 345 kV or 115 kV lines, and/or 115 kV line re-conductorings.

The Greater Boston Needs Assessment identified two concerns in the “design cases” with Salem Harbor retired. The first is higher thermal loading on the 345 kV Boston area ties without Salem Harbor. This is generally caused by the need to import power over the Boston Interface ties to replace the Salem Harbor capacity internal to the Boston area. The second concern is the higher thermal loadings on the North Shore 115 kV system.

As discussed in the December 16 Presentation, there are two alternative transmission solutions that relieve the loading on the Boston area 345 kV ties and two alternative options for the North Shore area that would address the reliability need for the Salem Harbor Station.<sup>9</sup> The two solutions that address the 345 kV overloads include a 345 kV transmission line from Scobie to Tewksbury to Woburn or a 345 kV transmission line from Seabrook to Ward Hill to Wakefield Junction to Woburn. The two solutions for

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<sup>9</sup> December 16 Presentation at 26.

the North Shore include a new 345 kV transmission line from Ward Hill to Wakefield Junction or the re-conductoring of six 115 kV transmission lines.<sup>10</sup>

The Scobie to Tewksbury to Woburn 345 kV transmission lines have been identified as the preliminary preferred solution because it is more cost-effective than the Seabrook to Ward Hill to Wakefield Junction to Woburn 345 kV option. With respect to the North Shore area, the re-conductoring of the North Shore 115 kV transmission lines has been identified as the preliminary preferred solution because it is more cost-effective than the 345 kV option.<sup>11</sup> As stated in the December 16 Presentation, additional testing may impact the selection of the final preferred solution for both these areas.<sup>12</sup>

The selection of a preliminary preferred solution in the Central area is expected to be completed in the next six months. The ISO will present a finalized solution addressing all the needs identified in the Greater Boston Needs Assessment, including the identified need for the Salem Harbor Station, by the end of 2011. The next step under the regional planning process is for the Transmission Upgrades to be submitted to the appropriate state agencies for siting approval.

Under the Transmission Owners Agreement, the affected transmission owners are responsible for the siting and construction of Transmission Upgrades determined through the regional planning process to be needed for reliability.<sup>13</sup> Therefore, while the ISO will support the reliability need for a project in state siting proceedings, the transmission owner is ultimately responsible for seeking state siting and other related regulatory approvals. Historically, it has taken from four to seven years from the beginning of the siting process for a project of this magnitude to be placed in service. In compliance with the December 16 Order, the ISO does not expect the time from planning to construction of the transmission needed to displace the reliability needs associated with Salem Harbor to exceed that timeframe, assuming that state siting is not delayed and other regional transmission projects assumed to be in-service in the Salem Harbor studies are also sited and constructed, such as the Interstate Reliability Project component of the New England East-West Solution.

Moreover, as noted in Mr. Rourke's testimony, the ISO will continue to evaluate the need for the Salem Harbor Units based on changed conditions until the notification deadline under the Tariff.<sup>14</sup> A resource that has had a de-list bid rejected in an auction for reliability reasons may still have that de-list bid accepted at a later date as long as the ISO notifies the resource that it is no longer needed for reliability by 12:00 a.m. on June 1 of the year preceding the start of the Capacity Commitment Period for which the de-list bid was rejected.

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<sup>10</sup> The 115 kV transmission lines are Y-151, B-154N, C-155N, S-145, T-146, and G-133E.

<sup>11</sup> See December 16 Presentation at 28-29. The 345 kV option would require new right-of-way and possible undergrounding, while the re-conductoring would utilize existing right-of-way.

<sup>12</sup> December 16 Presentation at 34.

<sup>13</sup> Transmission Operating Agreement, Schedule 3.09.

<sup>14</sup> Rourke Testimony at p 11, line 18 -- p 12, line 1, filed on August 30, 2010 in Docket No. ER10-2477-000.

Respectfully submitted,

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**ATTACHMENT A**

# Greater Boston Study Needs Assessment/Solution Study Status Update

PAC Meeting

December 16, 2010

Andrew Kniska

Lead Engineer, Transmission Planning

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# Agenda

- Background
- Overview
- Critical Load Level Assessment Update
- Short-Circuit Assessment
- Solution Assessment Update
- Preliminary Preferred Solution Discussion

# Background

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# Study Objective

- Identify the reliability based needs in the Greater Boston study area while considering the following
  - Future load growth
  - Reliability for a range of generation patterns
  - All applicable transmission planning standards
  - Limited short-circuit margins
- Evaluate and develop a regulated transmission solution to address the needs identified in the Needs Assessment
  - Meets reliability criteria
  - Cost effective



# Study Progress (History)

- Needs Assessment scope presented to PAC in May 2008
  - [http://www.iso-ne.com/committees/comm\\_wkgrps/prtcpnts\\_comm/pac/mtrls/2008/may202008/index.html](http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/pac/mtrls/2008/may202008/index.html)
- Initial needs presented to PAC in January 2009
  - [http://www.iso-ne.com/committees/comm\\_wkgrps/prtcpnts\\_comm/pac/mtrls/2009/jan212009/index.html](http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/pac/mtrls/2009/jan212009/index.html)
- Detailed preliminary needs and Notification of Solution Study discussed at PAC in July 2009
  - [http://www.iso-ne.com/committees/comm\\_wkgrps/prtcpnts\\_comm/pac/mtrls/2009/jul162009/index.html](http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/pac/mtrls/2009/jul162009/index.html)
- Needs Assessment Status Update in December 2009
  - [http://www.iso-ne.com/committees/comm\\_wkgrps/prtcpnts\\_comm/pac/mtrls/2009/dec162009/index.html](http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/pac/mtrls/2009/dec162009/index.html)

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# Study Progress (History), *cont.*

- Needs Assessment/Solution Study Status Update and Preliminary Discussion of Alternatives presented at PAC in March 2010
  - [http://www.iso-ne.com/committees/comm\\_wkgrps/prtcpnts\\_comm/pac/mtrls/2010/mar182010/index.html](http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/pac/mtrls/2010/mar182010/index.html)
  - Four solution options presented and discussed with PAC
  - PAC recommended keeping two options (Option A and Option B)
  - Request by PAC for critical load level assessment
  - Request by PAC to map the needs to a solution
- Final “Greater Boston Area Transmission Needs Assessment” report posted in July 2010
  - [http://www.iso-ne.com/committees/comm\\_wkgrps/prtcpnts\\_comm/pac/reports/index.html](http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/pac/reports/index.html)

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# Option A: Major Transmission Additions

*(as defined in the March 18 PAC update)*

- Scobie – Tewksbury 345 kV Line
- Lexington – Waltham 230 kV Line
  - Includes a 345/230 kV Auto at Lexington
- Sudbury 230/115 kV Autotransformer
- Sudbury – Hudson 115 kV Line
- Holbrook – Walpole 115 kV Line
- Woburn – Mystic 115 kV Line
- Wakefield – Everett 115 kV Line
- Brighton – Waltham 115 kV Cables (2)
- Numerous upgrades of existing equipment and reconfigurations of existing stations

# Option B: Major Transmission Additions

*(as defined in the March 18 PAC update)*

- Seabrook to Ward Hill 345 kV Line
- Lexington – Waltham 345 kV Line
  - Includes a 345/230 kV Auto at Waltham
- Woburn to Lexington 115 kV Line
- Framingham – Speen 115 kV Line
- Converting 69 kV to 115 kV in western suburbs of Boston
- Woburn – Mystic 115 kV Line
- Wakefield – Everett 115 kV Line
- Numerous upgrades of existing equipment and reconfigurations of existing stations

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# Overview

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# Study Effort Since March 2010 PAC

- Finalized the Needs Assessment Report
- Identified a solution(s) corresponding to each reliability need
- Performed a Critical Load Level Assessment
  - Studied a nine-year horizon from 2011 – 2019
  - Updated loads to 2010 CELT
  - Includes DR from FCA #1 – FCA #3
  - N-1 and N-1-1 Assessment
- Conducted a Short-Circuit Assessment
  - Completed an assessment for the Pre-Upgrade Base Case, Option A Case, and Option B Case
- Completed a preliminary Solution Study
  - N-1 and N-1-1 assessment
  - Transfer analysis to quantify reliability benefit of competing upgrades
  - Developed cost estimates for the upgrades

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# Major Challenges Encountered

- Assessing the impact of several major 345 kV transmission line additions
  - Iterative evaluation process
  - Required additional upgrades in each option
- Identifying a cost effective combination of individual upgrades from Option A and Option B
- Assessing short-circuit issues
  - Several overdutied breakers in the pre-upgrade base case
  - Numerous substations with only slight margin in the pre-upgrade base case
  - Impact of individual upgrades
- Considering Salem Harbor Permanent De-List
- Refining “system adjustments” allowed after the 1<sup>st</sup> contingency for N-1-1 testing since the Needs Assessment was completed
  - Discussed in upcoming slide

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# Identifying a Cost-Effective Combination of Upgrades

- Mapped upgrade(s) to needs identified in the Needs Assessment
- Identified the common upgrades
- Tested the competing upgrades
  1. North of Boston
    - Two competing upgrades between Boston and northern New England
      1. Scobie – Tewksbury – Woburn 345 kV
      2. Seabrook – Ward Hill – Wakefield Jct. – Woburn 345 kV
    - Two competing upgrades for the North Shore area
      1. Ward Hill – Wakefield Junction 345 kV
      2. Re-conductor six 115 kV lines
  2. South of Boston
    - Two competing upgrades for Medway Area
      1. Loop the C-129N/201-502 Depot Street to Beaver Pond into Medway 115 kV
      2. Re-conductor two 115 kV lines
  3. Central area solution development ongoing
    - Requires iterative testing between steady-state, short-circuit, and stability

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# Salem Harbor Permanent De-List

- Needs Assessment and Solution Assessment addressed Salem Harbor retirement as a sensitivity
- Salem Harbor submitted a permanent de-list request on October 6, 2010 for FCA #5
- Salem Harbor retirement sensitivities are now considered “Design” cases
  - De-listed units cannot be relied upon for capacity
    - Considered out-of-service for reliability assessments
  - De-listed units cannot be adversely impacted
    - Solution Studies must test with de-listed units in-service to ensure upgrades do not adversely impact the units
- Also added additional cases with Salem Harbor out of service to fully assess the impact of the permanent de-list request

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# Refinement of N-1-1 “System Adjustments”

- Criteria allows for system adjustments between first and second contingencies
  - Needs Assessment
    - Allowed Boston area re-dispatch
      - Boston Area Quick Start generation dispatched as needed to respond to overloads
      - Reduce Boston Area online generation when necessary
    - Maintained system stresses (i.e., North/South or SEMA/RI interface levels)
    - Allowed phase shifter adjustments
  - Critical Load Level and Solution Assessment
    - Allowed a New England re-dispatch limited to 1,200 MW
      - New England Quick Start generation dispatched as needed to respond to overloads
      - Reduce online generation when necessary
    - Allowed the relaxation of system stresses (i.e., North/South or SEMA/RI interface levels)
    - Allowed phase shifter adjustments

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# Critical Load Level Assessment

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# Critical Load Level Analysis Description

- Created base cases for every year of the nine-year horizon of the study period
  - Maintained the same base case Boston area dispatches and critical interface transfer levels (i.e., North/South)
  - Adjusted system loads to reflect 2010 CELT 90/10 forecast
  - Added Boston area DR through FCA 3
- Load Levels Studied (next slide)
- Considered N-1 (STE) without system adjustments, N-1 (LTE) allowing for system adjustments, and N-1-1 allowing for system adjustments

# Load Levels Studied

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Boston 2010 CELT 90/10 Load	6075	6165	6245	6325	6425	6500	6570	6635	6700
Passive DR	139	208	208	208	208	208	208	208	208
Active DR	156	188	188	188	188	188	188	188	188
Net Boston Load Modeled	5780	5769	5849	5929	6029	6104	6174	6239	6304
NEPOOL Load	29835	30390	30840	31340	31810	32180	32545	32895	33225

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# Critical Load Level Results

- Results are under review
- Expect to finalize and post a Needs Report Addendum 1<sup>st</sup> Quarter of 2011

# Short-Circuit Assessment

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# Base Case Short-Circuit Assessment Results

- Finalized models for the 2013 base case
  - Consistent with 2013 Needs Assessment power flow cases
- Results show base case overdutied breakers at **REDACTED - Critical Energy Infrastructure Information**
  - Solutions to overdutied breakers are being pursued as part of the Solution Assessment

REDACTED - Critical Energy Infrastructure Informal

# Solution Assessment Update

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# Solution Assessment Activities

## *(Determining the North and South Sub-area Solutions)*

- Recall from Slide 13
  - Identified common upgrades and tested competing upgrades in North and South of Boston
  - Central area solution development ongoing
- Steady State Assessment
  - N-1 and N-1-1 analysis of the competing upgrades in the North and South areas
  - Transfer Analysis comparing North area options
- Short-Circuit Assessment
- Feasibility Review
- Preliminary Cost Estimates
- Preliminary Preferred Solution

# N-1 and N-1-1 Analysis of Competing Upgrades

- Completed the N-1 and N-1-1 testing for the competing options in the North and South sub-areas
  - Validated that the competing options in each area solved the needs

# Steady State Assessment

## *(Transfer Analysis)*

- Performed a transfer analysis to compare the performance of the competing options in the North sub-area
- Capture the impact of the two competing north upgrades on Boston Import capability focusing on the known interaction between the North/South interface and Boston Import limits
  - Scobie – Tewksbury – Woburn 345 kV
  - Seabrook – Ward Hill – Wakefield Junction – Woburn 345 kV
- Capture the load serving capability of the two competing upgrades for the North Shore
  - Ward Hill – Wakefield Junction 345 kV
  - Re-conductoring six 115 kV lines

# Steady State Assessment

## *(Transfer Analysis Conclusions)*

- Boston to northern New England 345 kV tie
  - Both options provide an increase to both the Boston Import and North/South interface capabilities
  - No clear winner between the two options based on transfer capability
- North Shore
  - Both options allow the retirement of Salem Harbor past the 2019 study horizon (North Shore load 1,325 MW)
  - Approximately 100 MW of additional load-serving capability for the 345 kV option than the 115 kV re-conductoring option
    - 115 kV option can serve approximately 1,600 MW of North Shore load
    - 345 kV option can serve approximately 1,700 MW of North Shore load

# Short-Circuit Assessment

- An assessment was done to capture the impact of the North and South sub-area Preliminary Preferred Upgrade
  - No adverse impacts
- The evaluation of solution option impacts of the Central Area upgrades is ongoing

# Feasibility

- Feasibility covered in the March 18 PAC presentation
- Tie to northern New England options
  1. Scobie – Tewksbury – Woburn 345 kV
    - 38 miles of new 345 kV OH
    - Uses existing ROW
    - Requires rebuilding of 115 kV for 22 miles
  2. Seabrook – Ward Hill – Wakefield Junction – Woburn 345 kV
    - 24 miles of new 345 kV OH for Seabrook to Ward Hill 345 kV
      - Requires expansion of existing ROW including acquiring new land and/or easements for approximately 17 miles
      - Rebuilding of 115 kV for 7 miles
    - Approximately 40 miles of new 345 kV OH for Ward Hill to Wakefield Junction 345 kV depending on the route
      - Parts of Ward Hill – Wakefield Junction 345 kV will require new ROW
      - Possibility for underground cable needed (further increasing the cost)
    - 11 miles of new underground 345 kV for Wakefield Jct. – Woburn section

# Feasibility, *cont.*

- North Shore options (applicable only to the Scobie-Tewksbury-Woburn 345 kV option)
  1. Ward Hill – Wakefield Jct. 345 kV
    - See previous slide
  2. Re-conductoring six 115 kV lines on existing ROW
- South sub-Area options
  1. Re-conductoring C-129N/201-502 Beaver Pond – Depot St. 115 kV and D-130/201-501 Medway – Depot St. 115 kV
    - Re-conductoring of approximately 4.5 miles on existing ROW
  2. Looping C-129N/201-502 into Medway
    - Re-conductoring of approximately 2.2 miles of existing ROW
    - Requires expansion of Medway 115 kV Substation
    - Requires the relocation of several existing 345 kV lines including 345 kV DCT towers

# Preliminary Cost Estimates

## *(North Area)*

- Boston to northern New England 345 kV line options
  1. Scobie – Tewksbury – Woburn 345 kV = \$155M
    - Plus one of the North Shore Options
      - A. Ward Hill – Wakefield = \$74M
      - B. North Shore 115 kV re-conductoring = \$51M
        - Plus cost of re-conductoring of Y-151 from Tewksbury – Tewksbury Jct.
        - Plus cost of re-conductoring G-133 from Ward Hill – West Methuen
  2. Seabrook – Ward Hill – Wakefield – Woburn 345 kV = \$410M

# Preliminary Cost Estimates

## *(North Area), cont.*

- Seven upgrades common to either plan = \$93M
  1. Woburn - North Cambridge 345 kV = \$52M \*
  2. 2<sup>nd</sup> Woburn 345/115 kV Auto = \$23M \*
  3. Re-conductor Tewksbury to Pinehurst section of the M-139 & N-140 115 kV lines = \$12M
  4. Re-conductor Wakefield Jct. to Everett F-158N & F-158S 115 kV lines = \$2M
  5. Re-conductor Chelsea - Revere 128-518 115 kV line = \$2M
  6. Chelsea 115 kV 63 MVar capacitor bank = \$2M
  7. Plus cost of Wakefield - Everett 115 kV Line

\* Approximately \$75M of the common cost upgrades will be re-evaluated during the Central sub-area testing

# Preliminary Cost Estimates

## *(South Sub-Area)*

- South Sub-Area Upgrade Options
  1. Re-conductoring C-129N/201-502 and D-130/201-501 = \$4M
  2. Tying C-129N/201-502 into Medway = \$14M
- Common upgrade to either plan = \$19M
  1. West Walpole – Holbrook 115 kV Line

# Preliminary Preferred Solution Discussion

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# North Area Preliminary Preferred Solution\*

- Re-conductor the Tewksbury to Pinehurst M-139 & N-140 115 kV Lines
- Mystic to Wakefield Area
  - Re-conductor the Golden Hills to Everett F-158N & F-158S 115 kV Lines
  - Re-conductor Chelsea – Revere 128-518 115 kV line
  - Construct a new 115 kV line between Wakefield and Everett
  - Chelsea 115 kV Capacitor
- Construct a 345 kV line Scobie – Tewksbury – Woburn
- Re-conductoring North Shore the 115 kV Lines
  - Y-151, B-154N, C-155N, S-145, T-146, and G-133E

\* Results of stability, short circuit, TNA, and BPS testing may have an impact on the final Preferred Upgrades

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# Re-conductor the M-139 & N-140 115 kV Lines

REDACTED - Critical Energy Infrastructure Information

REDACTED - Critical Energy Infrastructure Information

REDACTED - Critical Energy Infrastructure Information

REDACTED - Critical Energy Infrastructure Information

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# Mystic to Wakefield Area Upgrades

**REDACTED - Critical Energy Infrastructure Information**

**REDACTED - Critical Energy Infrastructure Information**

**REDACTED - Critical Energy Infrastructure Information**

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# Scobie – Tewksbury – Woburn 345 kV

**REDACTED - Critical Energy Infrastructure Information**

**REDACTED - Critical Energy Infrastructure Information**

**REDACTED - Critical Energy Infrastructure Information**

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# Re-conductoring the North Shore 115 kV Lines

**REDACTED - Critical Energy Infrastructure Information**

**REDACTED - Critical Energy Infrastructure Information**

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# South Area Preliminary Preferred Solution\*

- Construct a new 115 kV line between West Walpole and Holbrook
- Re-conductoring C-129N/201-502 and D-130/201-501

\* Results of stability, short circuit, TNA, and BPS testing may have an impact on the final Preferred Upgrades

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# South Area Preliminary Preferred Solution

**REDACTED - Critical Energy Infrastructure Information**

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**PUBLIC REDACTED VERSION**

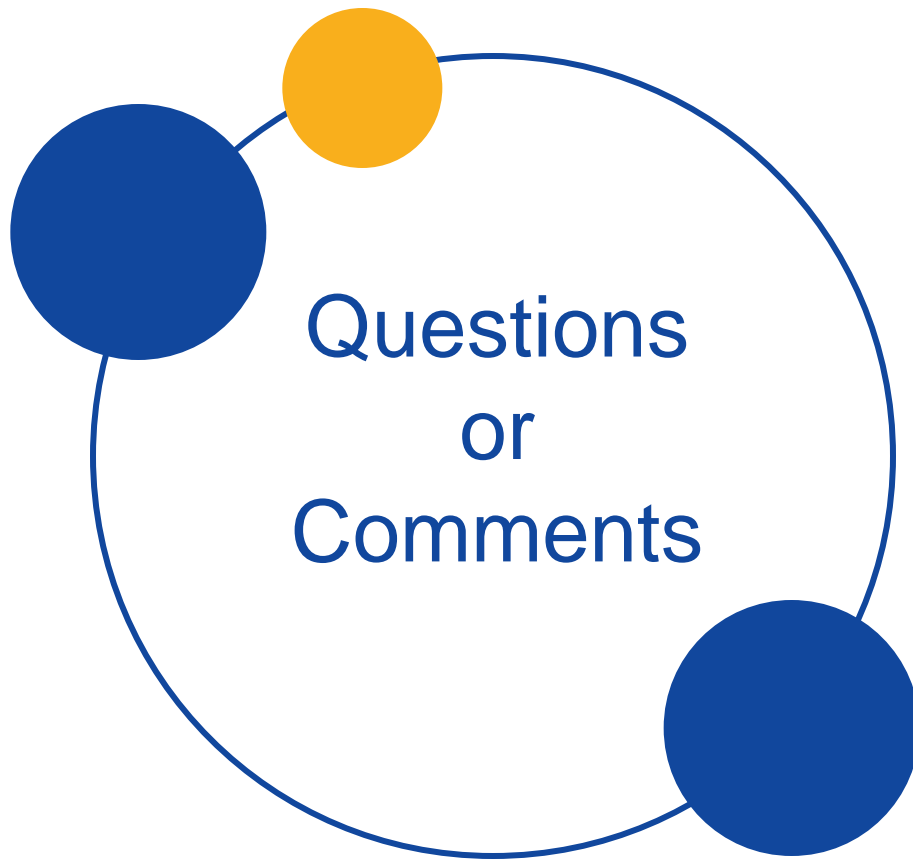
# Next Steps

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# Continue Central Area Solution Development

- Iterative process between
  - Steady State Assessment
    - Determining the most cost-effective upgrades to address steady-state needs
    - Evaluating options to address base case short-circuit overduties and potential overduties introduced by upgrades
  - Short-Circuit Assessment
    - Testing the impact of upgrades including short-circuit solutions
  - Stability Screening
    - As a result of opening breakers to address base case and upgrade case short-circuit overduties
- Expect the selection of a preferred solution for the Central Area to take approximately six months

**PUBLIC REDACTED VERSION**



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## CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon the parties designated on the official service list for the above-captioned docket in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.2010 (2010).

Dated at Washington, D.C. on this the 22nd day of December 2010.

/s/ Sherry A. Quirk  
Sherry A. Quirk, Esq.  
Attorney for ISO New England Inc.