March 31, 2005

D.T.E. 04-71

Petition of Boston Edison Company d/b/a NSTAR Electric for a determination by the Department of Telecommunications and Energy, under the provisions of G.L. c. 164, § 72, that relocation of 3 miles of 115 kV transmission line in Framingham, Natick, and Sherborn is necessary and will serve the public convenience and is consistent with the public interest.

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I. INTRODUCTION

On July 19, 2004, Boston Edison Company d/b/a NSTAR Electric ("NSTAR" or "Company")[1] filed a petition with the Department of Telecommunications and Energy ("Department") pursuant to G.L. c. 164, § 72, seeking authority from the Department to construct, maintain, and operate an overhead 115 kilovolt ("kV") line. The proposed 3-mile overhead electric transmission line would replace, in an adjacent and parallel location, a portion of an existing 115 kV transmission line currently located on one side of a set of double-circuit steel towers within an existing right-of-way ("ROW") in Framingham, Natick, and Sherborn (Exh. NSTAR-1, App. A at 1-1 to 1-4). Beginning in Framingham, the relocated line would tie into the existing 115 kV line that emanates from NSTAR's existing Speen Street substation, located near the intersection of Speen Street and Cochituate Road (id.). The tie-in point would be at the southeast corner of the AMC Theaters complex located on Flutie Pass between the Natick Mall and Shoppers World (id.). From there, the relocated line would run southwesterly to the southeast corner of the Shoppers World complex before turning south and crossing Route 9 into Natick (id.). On the south side of Route 9, the proposed line would continue south and, at approximately one mile from the project's northern starting point, would cross Hartford Street (id.). The relocated line would then proceed south, crossing the Massachusetts Bay Transportation Authority ("MBTA") rail line and Route 135 (id.). From there, the relocated line would continue south to southwest, crossing the Natick/Sherborn town boundary, a Massachusetts Water Resources Authority aqueduct and a CSX rail line (id.). At

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[1] NSTAR is a Massachusetts corporation authorized to transmit, purchase, sell, and distribute electricity as described in G.L. c. 164 (Exh. NSTAR-1, App. A at 1-1).

its endpoint in Sherborn, just after the CSX rail line crossing, the relocated line would tie-back into the existing 115 kV line, which extends to the NSTAR Leland Street substation (id.). NSTAR seeks a determination by the Department that the proposed electric transmission line is necessary and will serve the public convenience and be consistent with the public interest (Exh. NSTAR-1, at 1). The petition was docketed as D.T.E. 04-71.

On October 14, 2004, after notice duly issued, the Department conducted a public hearing in Natick. ISO New England, Inc. ("ISO-NE") filed a timely petition to participate as a limited participant; this petition was granted by the Hearing Officer on November 3, 2004. In support of its petition, the Company submitted 6 exhibits, which included the testimony of: Steve M. Masse, Senior Planning Engineer, System Planning Department, NSTAR Electric & Gas Corporation; Gregory R. Sullivan, Director of Transmission Engineering, NSTAR Electric & Gas Corporation; Pamela M. Chan, Senior Program Manager, TRC Environmental Corporation; David P. Estey, P.E., Principal Electric Engineer, E/PRO Engineering and Environmental Consulting, LLC; William N. Nayes, Jr., Senior Arborist, Vegetation Management Department, NSTAR Electric & Gas Corporation; and Dr. Peter Valberg, Principal and Senior Scientist, Gradient Corporation. The Company also responded to 60 Department information requests and 12 record requests. Evidentiary hearings were held on February 24 and 28, 2005.

II. STANDARD OF REVIEW

G.L. c. 164, § 72, requires, in relevant part, that an electric company seeking approval to construct a transmission line must file with the Department a petition for:

> authority to construct and use … a line for the transmission of electricity for distribution in some definite area or for supplying electricity to itself or to another electric company or to a municipal lighting plant for distribution and sale … and shall represent that such line will or does serve the public convenience and is consistent with the public interest …. The [D]epartment, after notice and a public hearing in one or more of the towns affected, may determine that said line is necessary for the purpose alleged, and will serve the public convenience and is consistent with the public interest.[2]

The Department, in making a determination under G.L. c. 164, § 72, is to consider all aspects of the public interest. Boston Edison Company v. Town of Sudbury, 356 Mass. 406, 419 (1969). Section 72, for example, permits the Department to prescribe reasonable conditions for the protection of the public safety. Id. at 419-420. All factors affecting any phase of the public interest and public convenience must be weighed fairly by the Department in a determination under G.L. c. 164, § 72. Town of Sudbury v. Department of Public Utilities, 343 Mass. 428, 430 (1962).

In evaluating petitions filed under G.L. c. 164, § 72, the Department examines: (1) the need for, or public benefits of, the present or proposed use (see Massachusetts Electric Company, D.P.U. 93-29/30, at 10-14, 22-23 (1995); New England Power Company, D.P.U. 92-278/279/280, at 19-22 (1994) ("NEPCo, D.P.U. 92-278/279/280"); Tennessee Gas Pipeline Company, D.P.U. 85-207, at 6-9 (1986) ("Tennessee")); (2) the environmental impacts or any other impacts of the present or proposed use (see NEPCo, D.P.U. 92-278/279/280, at 20-23; New England Power Company, D.P.U. 92-270, at 17-20 (1994)

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[2] Pursuant to G.L. c. 164, § 72, the electric company must file with its petition a general description of the transmission line, a map or plan showing its general location, an estimate showing in reasonable detail the cost of the line, and such additional maps and information as the Department requires.

("NEPCo, D.P.U. 92-270"); Tennessee, at 20-25); and (3) the present or proposed use and any alternatives identified (see NEPCo, D.P.U. 92-278/279/280, at 19; NEPCo, D.P.U. 92-270, at 17; Tennessee, at 18-20). The Department then balances the interests of the general public against the local interests and determines whether the line is necessary for the purpose alleged and will serve the public convenience and is consistent with the public interest.[3]

III. DESCRIPTION

A. Overview

NSTAR proposes to relocate a 115 kV transmission line onto a set of new structures to address system reliability in the event of operational contingencies (Exh. NSTAR-1, App. A at 1-1). The 115 kV line is currently located on one side of a set of double-circuit steel towers (id.). A second transmission line (230 kV) is located on the other side of the double-circuit steel towers (id. at Fig. 1.2-1). The relocated line, approximately 3 miles long, would extend from NSTAR's existing Speen Street substation to a tie-back into the existing 115 kV line in Sherborn that extends to the NSTAR Leland Street substation (id. at Fig. 1.1-1). In addition to these two transmission lines, the ROW currently contains three distribution lines (id. at Fig. 1.2-1).

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[3] In addition, the Massachusetts Environmental Policy Act provides that "[a]ny determination made by an agency of the commonwealth shall include a finding describing the environmental impact, if any, of the project and a finding that all feasible measures have been taken to avoid or minimize said impact" ("Section 61 findings"). G.L. c. 30, § 61. Pursuant to 301 CMR 11.12(5), these findings are required if the Secretary of Environmental Affairs has required an Environmental Impact Report ("EIR") for the project. The Company informed the Department that no EIR is required for the proposed transmission relocation project (Exh. NSTAR-1, App. Att. A). Accordingly, Section 61 findings are not necessary in this case.

We summarize below the evidence presented by NSTAR regarding the need for the transmission line, project alternatives, and impacts of the proposed transmission relocation project.

B. Need for the Proposed Project

NSTAR stated that the proposed transmission relocation project is needed to address system reliability issues in the project area, which it defined as an area in the western part of its service territory served by NSTAR's Speen Street substation in Framingham, its Trapelo Road substation in west Waltham, and its Sudbury, Maynard, Waltham, and Watertown substations ("project area"),[4] and to maintain its transmission system consistent with the reliability standards and criteria developed by the Northeast Power Coordinating Committee ("NPCC") and ISO-NE (Exh. NSTAR-1, App. A at 2-1, 2-6). NSTAR stated that its modeling currently projects thermal overloads in the project area under summer 2005 peak loads,[5] in the contingency of the simultaneous failure of two transmission lines (the 115 kV 433-507 line and the 230 kV 282-602 line) located on a double-circuit tower (id. at 2-5). The Company indicated that these modeled overloads violate NPCC and ISO-NE planning

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[4] The project area also includes the Town of Concord, which is served by the Concord Municipal Electric Company (Exh. NSTAR-1, App. A at 2-6; Tr. 1, at 69).

[5] NSTAR provided forecasts of summer 2005 peak loads to be served by the Trapelo Road, Waltham, Watertown, Sudbury, Maynard, and Speen Street substations and by the Town of Concord (Exh. NSTAR-1, App. A at 2-10). The Company explained that it developed the substation load forecasts by allocating the NEPOOL-wide peak load forecasts developed by ISO-NE to individual substations, using software that considers factors such as historical load data, demographic information, and zoning information for each substation area (id. at 2-9). The Company estimated that Town of Concord load would grow at a similar rate as NSTAR loads (id. at 2-10).

standards, which require that system stability be maintained, and that line loadings be maintained within applicable emergency limits, following certain contingencies, including the loss of both circuits on a double-circuit tower[6] (Exhs. DTE-N-3(A) at 5, 6; DTE-N-3(B), at 7).

NSTAR stated that it modeled the ability of the local area transmission system to withstand certain contingencies in the project area, which is served by the following transmission lines:

* 282-602, a 230 kV overhead line connecting the Waltham and West Medway substations;
* 433-507, a 115 kV overhead line connecting the Leland Street and Speen Street substations in Framingham;
* 282-507, a 115 kV overhead line connecting the Waltham and Sudbury substations;
* 342-507, a 115 kV overhead line connecting the Waltham and Speen Street substations;
* 416-526 and 416-527, a pair of 115 kV underground lines connecting the Sudbury and Maynard substations;
* 320-507 and 320-508, a pair of 115 kV overhead lines connecting the Lexington, Trapelo Road, and Waltham substations; and
* 282-520 and 282-521, a pair of 115 kV underground lines connecting the Brighton, Watertown, and Waltham substations

(Exh. NSTAR-1, App. A at 2-6, 2-11). The 282-602 and 433-507 lines share double-circuit towers for a portion of the ROW between Leland Street and Speen Street in Framingham (id. at 2-6, Fig. 2.3-1). The Company's modeling indicated that, following the loss of the double-circuit tower carrying the 282-602 and 433-507 lines, six separate transmission lines would be loaded above their long term emergency ("LTE") ratings (id. at 2-12). The Company noted

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[6] NSTAR stated that, during the last seven years, there have been at least three instances where both circuits on a double-circuit transmission line on the NSTAR system failed simultaneously (Exh. DTE-N–14; Tr. 1, at 73). The Company noted that one of these outages was on the circuits under consideration in this case; that outage was caused by lightening (Tr. 1, at 73-74). The Company indicated that failure of a shielding wire, structural failure, and conductor failure also could result in a double-circuit outage (Exh. DTE-N-6(c)).

that the short-term emergency ("STE") ratings for the 320-507 and 320-508 lines are identical to their LTE ratings; thus, the STE ratings of these lines also would be exceeded (id. at 2-13).[7] The results of the Company's modeling are shown in Table 1, below.

TABLE 1: LINE LOADING FOLLOWING DOUBLE CIRCUIT FAILURE
2005 Thermal Analysis

Line #	From	To	Voltage	% LTE
320-508	Lexington	Trapelo	115 kV	113.7
320-507	Lexington	Trapelo	115 kV	113.7
282-520	Brighton	Watertown	115 kV	147
282-521	Brighton	Watertown	115 kV	140.8
282-507	Waltham	Sudbury	115 kV	104
240-510	Baker	Needham	115 kV	106.5

Source: Exh. NSTAR-1, App. A at 2-12.

The Company stated that there were no "prompt system actions", other than disconnecting customers, that could be used to reduce loadings on the affected lines within the specified time limits (id. at 2-13). Therefore, under this contingency, the system operator would be required to shed customer load from the overloaded facilities to protect equipment from permanent damage (Exh. DTE-N-7). The Company noted that, if the system operator were unable to disconnect customers quickly enough to protect the overloaded equipment from failure, other transmission lines could subsequently fail, raising the possibility of a cascading

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[7] NSTAR explained that, following a contingency, transmission lines may be operated at loads up to their LTE rating for up to 12 hours (Exh. NSTAR-1, App. A at 2-10). Transmission lines may be operated at loads exceeding their LTE rating, but less than their STE rating, for no more than 15 minutes (id. at 2-10). The Company stated that, if a line is loaded above its STE rating, the Company has approximately five minutes to alleviate the overload by shedding load (id. at 2-11).

outage that could interrupt service to the entire project area (id.). The Company stated that it would be unacceptable to rely on operator intervention as a response to the overloads, both because of the short time available for operator action (lines may not be loaded above their STE rating for more than five minutes) and because of the large-scale loss of service that could result if action was not taken quickly enough (Exh. DTE-N-8).[8]

C. The Proposed Project and Alternatives

NSTAR investigated four means of addressing the thermal overload issues described in Section III.B: the proposed transmission relocation project, and Alternatives 1, 2, and 3 (Exh. NSTAR-1, App. A at 3-1). The Company indicated that the proposed transmission relocation project would eliminate the possibility of the simultaneous failure of the 433-507 and 282-602 lines due to a double-circuit contingency by relocating the 433-507 line to a separate set of single-circuit structures within the same ROW (id. at 2-1). NSTAR's modeling indicated that no thermal overloads would result from the individual loss of either the 433-507 line or the 282-602 (id. at 2-12). The Company estimated that the proposed transmission relocation project would cost $1.76 million (id. at 3-4).

Alternative 1 would involve the construction of a new 115 kV transmission line in the same ROW as the 282-602 and 433-507 lines, extending approximately 23,300 feet from the Leland Street substation to the Speen Street substation in Framingham (id.). This new line would remain in service during the failure of the double-circuit tower, averting the projected

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[8] NSTAR's modeling also projected low voltage conditions at area substations following the loss either of the double-circuit tower or of line 433-507 (Exh. NSTAR-1, App. A at 2-14). However, NSTAR stated that it intended to address this problem separately from the thermal overload issues (id.).

overload conditions (id. at 3-2). NSTAR estimated that construction of the new line and related work at the Leland Street and Speen Street substations would cost approximately $3.6 million (id.).

Alternative 2 would involve the construction of a new underground transmission line between Station 282 in Waltham and Station 329 in Brighton, to relieve the two underground circuits (282-520 and 282-521) that would overload if the double-circuit tower were lost (id.). In addition, the two overhead circuits between Station 320 in Lexington and Station 450 at Trapelo Road (320-507 and 320-508) would be reinforced to enable them to carry projected loads under the double-circuit contingency (id.). NSTAR estimated that the total cost of Alternative 2, including new substation equipment at both ends of the new underground transmission line, would be $25.7 million (id. at 3-3).

Alternative 3 involves replacing the two existing underground circuits between Station 329 in Brighton and Station 282 in Waltham with higher capacity conductors, and reinforcing the two overhead transmission lines between Station 302 in Lexington and Station 450 at Trapelo Road (id.). The Company noted that each underground circuit would have to be removed from service for up to two months while the cables were removed and replaced (id.). The Company estimated that the total cost of Alternative 3 would be $19.6 million (id.).

In comparing the proposed transmission relocation project with the three alternatives, NSTAR noted that Alternative 1 would be twice as expensive as the proposed project, and that Alternatives 2 and 3 would be more than ten times as expensive (id. at 3-4). The Company also noted that the proposed project and Alternative 2 could be put in place with relatively short cutover outages of existing lines and equipment (id. at 3-8). In contrast, construction of

Alternative 1 would require a two-week outage of an existing 115 kV transmission line which travels north toward Sudbury from the Speen Street substation, and construction of Alternative 3 would require each of two underground 115 kV circuits to be taken out of service for up to two months (id. at 3-3, 3-4). The Company indicated that the longer outages would place continuity of service at risk during the construction period (id.).

The Company asserted that the environmental impacts of the proposed project and Alternative 1 would be similar, as each involves placing an overhead transmission line in an existing ROW; however, the Company noted that Alternative 1 would require expanding the Speen Street substation into wetlands (id. at 3-4). The Company stated that construction of Alternative 2 likely would involve extensive excavation in congested roadways and a new crossing of the Charles River (id.). Alternative 3 would avoid the street excavation associated with Alternative 2, but there would still be some traffic disruption associated with cable removal, pulling and splicing at approximately 20 manholes (id. at 3-5).

The Company acknowledged that Alternatives 1, 2, and 3 each would provide additional capacity to serve the project area, while the proposed project would simply relocate an existing transmission line within the same ROW (Tr. 1, at 61). However, the Company stated that this additional capacity is not needed within its ten-year planning horizon (id. at 61-62). Overall, the Company concluded that the proposed project was superior to Alternatives 1, 2, and 3 based on considerations of cost, reliability, environmental impacts, and traffic disruptions (Exh. NSTAR-1, App. A at 3-5; Tr. 1 at 60).

NSTAR also considered whether energy efficiency programs, demand response, and distributed generation could reduce loads in the project sub-area sufficiently to delay or

eliminate the need for the proposed transmission relocation project (Exh. DTE-N-10; Tr. 1, at 47-51). The Company estimated that summer peak load in the project sub-area would need to be reduced by 150 megawatts ("MW"), or approximately 23 percent, to ensure that all line loadings would be at or below LTE ratings following the loss of the double-circuit tower (Exh. DTE-N-10; Tr. 1, at 49-51). Based on a 2001 study submitted by Massachusetts investor-owned utilities to the Massachusetts Division of Energy Resources, NSTAR estimated that energy efficiency programs could reduce peak energy use in the project area by approximately 2.5 percent, or 6 MW (Exh. DTE-N-10, at 1-2). The Company also estimated a maximum demand response potential of approximately 28 MW in the project sub-area, and stated that siting, permitting, and cost considerations preclude reliance on distributed generation to meet 2005 summer peak load (id. at 2-3). The Company therefore concluded that demand side management and distributed generation were not feasible alternatives to the proposed transmission relocation project (id. at 3).

D. Impacts of the Proposed Project

1. Wetlands and Endangered Species

The Company stated that 21 wetland areas are located along the project ROW, including 7 isolated wetland areas subject to flooding and 14 wetland areas bordering streams (Exh. NSTAR-1, App. A at 4-7). The Company indicated that the project would result in the permanent alteration of a total of 21 square feet in three wetland areas, for the placement of three transmission poles, and the temporary alteration of approximately 18,740 square feet along existing dirt roads in seven wetland areas, for equipment access during construction (id. at 4-9; Exh. DTE-C-5S). The Company indicated that additional construction would occur

within 100-foot wetland buffer zone areas along the route, including the permanent placement of 17 of the 34 new transmission poles, and similarly portions of the work area required to install and remove facilities as part of the project (Exh. NSTAR-1, App. A at 4-9; Exh. DTE-E-8).

As replication for the permanently altered wetlands, the Company proposed to construct a new wetland of at least 31.5 square feet in area, 1.5 times the altered area (Exh. NSTAR-1, App. A at 4-9). To help minimize impacts on wetlands during construction, the Company would use swamp mats to protect the wetland areas that are to be traversed by equipment (id.). The Company indicated that it would restore or improve vegetative cover and soil stability in any temporarily disturbed areas, and also committed as part of the local permitting process to stabilize a currently disturbed drainage ditch embankment near Ranger Road in Natick (id. at 4-10; Tr. 1, at 93-94; Tr. 2, at 152).

The Company indicated that an Order of Conditions for the project had been received from each of the conservation commissions in Framingham and Sherborn, and was expected shortly from the Natick Conservation Commission (Exh. DTE-E-3; Tr. 2, at 132-133). The Company added that it had filed applications for a Massachusetts Department of Environmental Protection Section 401 Water Quality Certificate and a United States Army Corps of Engineers ("ACOE") General Permit to allow proposed construction in wetland areas (Exh. NSTAR-1, App. A at 4-10; Tr. 2, at 133-140).

The Company stated that it anticipated no significant impacts to wildlife as a result of the proposed transmission relocation project (Exh. NSTAR-1, App. A at 4-12). Citing correspondence from the United States Fish and Wildlife Service and the Natural Heritage and

Endangered Species Program of the Massachusetts Division of Fisheries and Wildlife, the Company noted that no rare or endangered species or exemplary natural communities are located in the project area (id.).

2. Land Use and Visual Impacts

The Company indicated that the proposed transmission relocation project would be undertaken entirely within existing, cleared ROW which is 250 feet in width and occupied by existing power lines (Exh. NSTAR-1, App. A at 4-12). The Company stated that, for the majority of the route, dense development, commercial or residential, is present in proximity to the ROW (id. at 4-14). The Company stated that the existing power line facilities along the northern portion of the route in Framingham are in a commercial area and, while visible, blend with surrounding features such as light poles, signs and commercial structures (id. at 4-14 to 4-15). The Company indicated that the remainder of the route traverses predominantly residential areas in Natick and Sherborn, including an approximately one-mile segment of ROW between Hartford Street and the MBTA rail line in Natick where very little buffer exists between some homes and existing power lines within the ROW (id. at 4-15). Elsewhere in Natick, to the north and south of this segment, the Company indicated that the ROW edges are more wooded and provide a degree of visual buffer from nearby residences in both leaf-off and leaf-on conditions (id.; Exh. DTE-E-17). At the southern end of the route in Sherborn, the Company stated that the existing power lines within the ROW traverse agricultural fields and are again generally visible from adjacent land and roadways, but residential development is sparse (Exh. NSTAR-1, App. A at 4-15).

The Company asserted that the proposed project would not result in any alteration of land use along the ROW, and would result in minimal visual impact (id. at 4-12, 5-1). The Company stated that the relocated transmission line would be constructed using weathering steel monopoles, and would not constitute a significant new visual element in the environment (id. at 5-1; Tr. 2, at 164). The Company noted that it generally would remove any trees within the ROW with a trunk diameter of greater than six inches and agreed to communicate with property owners where removal or pruning of trees were required on portions of the ROW held in easement (Exh. DTE-E-7; Tr. 1, at 90-91). The Company stated that, upon request from any property owner along the ROW, it will provide additional screening if warranted by changes in visual impacts to that property owner relative to existing conditions, provided operating and maintenance requirements for all ROW facilities are met (Exh. DTE-E-18). The Company agreed to post on the project website contact information for requesting visual mitigation (Exh. DTE-RR-7). The Company also stated that, to help ensure ROW security and ease of Company access as well as power line clearance, it generally does not maintain full screening adjacent to roadway crossings, but rather encourages that these areas remain open or contain limited plantings (Exh. DTE-RR-7(S)).

3. EMF

The Company indicated that it performed electric and magnetic field ("EMF") calculations to determine the maximum magnetic field values that would be produced with and without the proposed transmission relocation project (Exhs. DTE-E-22; DTE-E-25). The maximum magnetic field values at the east edge of the ROW, the edge nearer the proposed relocated line, would be 9.6 and 2.0 milligauss ("mG") for peak and off-peak operation,

respectively, without the project, increasing to 21.9 and 7.5 mG for peak and off-peak operation, respectively, with the project (Exh. DTE-E-22). On the west edge of the ROW, the maximum magnetic field values would be 23.4 and 10.0 mG for peak and off-peak operation, respectively, without the project, increasing to 25.2 and 15.4 mG for peak and off-peak operation, respectively, with the project (id.). The calculation showed that, 50 feet away from the ROW edges, magnetic field levels would drop off further, reaching levels one-third to two-thirds those at the ROW edges (id.).

Dr. Valberg testified that: (1) no regulatory or public health agency in the United States has established a numerical standard based on health applicable to the project area;[9] and (2) EMF values of the proposed transmission line are well below the guideline levels set by the International Committee on Non-Ionizing Radiation Protection and the Institute of Electrical and Electronics Engineers (Tr. 1, at 18-19, 26-27). According to the Company's witness, these levels are in the range of 800 mG and higher (id.).[10]

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9 The Company states that some states use guidelines based on maintaining typical existing ROW conditions, including: (1) a maximum level of 85 mG previously accepted by the Massachusetts Energy Facilities Board, and (2) levels of 150 and 200 mG set in Florida and New York, respectively (Exh. NSTAR-1, App. A at 4-24; Tr. 1, at 18, 24-26).

10 Dr. Valberg also testified that epidemiological studies regarding the effects of exposure to magnetic fields have shown only weak statistical associations between surrogates for magnetic fields and certain diseases, and have been inconclusive and inconsistent (Exh. NSTAR-1, App. A at 4-26; Tr. 1, at 10-22). In addition, he stated that laboratory tests have not uncovered biological mechanisms that could cause such associations (id.).

4. Other

The Company anticipated working with state and local highway officials, railroad officials, and owners of commercial properties traversed by the ROW, in order to develop plans to manage traffic and access to businesses during construction of the proposed project (Exh. NSTAR-1, App. A at 4-23 to 4-24). The Company stated it would use detail officers or flag men as is necessary to control traffic at crossings of roadways and rail lines (id. at 111-116; Exh. DTE-C-7). The Company noted that the traffic control plans likely would require stopping all traffic at crossings for several minutes while conductors are pulled into place above the crossing. At heavily traveled crossings, such as state highways and railroads, pulling operations would be undertaken outside peak commuter periods and possibly would be scheduled on Sundays to minimize traffic impact (Exhs. DTE-C-6; DTE-C-7; Tr. 2, at 175).

The Company indicated that it would limit construction work along the ROW to daylight hours, and typically would work Monday through Friday (Exh. DTE-C-6). The Company noted that, if necessary to complete the transmission relocation project by summer 2005 or to compensate for delays in construction, it might extend work into daylight evening periods, and might work on Saturdays (Exh. DTE-C-12). The Company stated that it would work with the construction contractor and affected abutters to minimize noise or other disturbance from any extended work hours, adding that possible measures could include rescheduling work, or adding staff and machines during normal hours, to avoid use of off-schedule periods (id.).

The Company stated that it had submitted a draft cultural resource survey report to the Massachusetts Historical Commission ("MHC"), recommending that no further investigations

of historical archeology along the proposed project route be undertaken (Tr. 2, at 133-134). The Company indicated that MHC review is pending and expressed the hope that final MHC concurrence would be received shortly (id. at 136-137). The Company noted that MHC concurrence is a pre-requisite for issuance of the ACOE General Permit, and that the ACOE may set a time line of 30 days for MHC action so that the ACOE can complete its review (id.).

IV. ANALYSIS AND FINDINGS

NSTAR is an electric company as defined by G.L. c. 164, § 1, authorized to generate, distribute and sell electricity (Exh. NSTAR-1, App. A at 1-1). Accordingly, the Company is authorized to petition the Department for a determination under G.L. c. 164, § 72 that its proposed transmission line "is necessary for the purpose alleged, and will serve the public convenience, and is consistent with the public interest." As discussed in Section II, above, the Department, in making this determination, first examines the need for or public benefits of the proposed use. The Department then examines the identified alternatives and the environmental and other impacts of the project. Finally, the Department balances the interests of the general public with any identified local interests.

As an initial matter, the Department finds that NSTAR, in its filing under G.L. c. 164, § 72, has complied with the requirement of § 72 that it describe the proposed transmission line, provide diagrams showing its general location, and estimate its cost in reasonable detail.

A. Need for the Proposed Project

NSTAR has demonstrated that the existing transmission lines and equipment in the area served by the Speen Street, Sudbury, Maynard, Waltham, Trapelo Road, and Watertown substations will be insufficient to comply with NPCC and ISO-NE reliability standards by the

summer of 2005. Specifically, the Company has shown that, under 2005 design summer conditions, the simultaneous loss of NSTAR's 282-602 and 433-507 lines, located on double-circuit towers, would result in the loading of six other 115 kV transmission lines above their LTE ratings, and the loading of two of these lines, the 320-507 and 320-508 lines, above their STE ratings. The Company has stated that there is no "prompt system action" that operators could take to return loadings on these lines to levels below their LTE and STE ratings within the respective time limits of 15 minutes and five minutes. In addition, the Company has indicated that, once lines are loaded above their ratings, it must manually remove customer load within applicable time limits or risk a cascading outage of the entire project sub-area. The Company also has demonstrated that construction of the proposed project would eliminate the modeled thermal overloads, thus bringing the transmission system into compliance with NPCC and ISO-NE reliability standards. Accordingly, the Department finds both a need for, and public benefits of, the construction and operation of the proposed transmission line.

B. The Proposed Project and Alternatives

As noted in Section III.C, above, NSTAR considered four options for addressing the modeled contingency overloads. The proposed transmission relocation project would address the overloads by placing the 282-602 and 433-507 lines on separate transmission towers, thus eliminating the possibility that they could both be lost as the result of a single contingency. Alternative 1 would create an additional 115 kV transmission line in the same ROW as the 282-602 and 433-507 lines, thus providing an additional path between the Speen Street and Leland Street substations if both existing lines were lost as a result of a double-circuit contingency. Alternatives 2 and 3 would upgrade, reinforce or replace certain existing

transmission lines to accommodate the load that would be placed on them under a double-circuit contingency.

In addition, NSTAR has analyzed the possibility that some combination of energy efficiency programs, demand response, and distributed generation could delay or eliminate the need for the proposed project. The record suggests that a demand reduction of 150 MW, or approximately 23 percent of summer peak load, would be needed to eliminate the modeled contingency overloads, and that a maximum reduction of approximately 34 MW would be available from energy efficiency and demand response programs in the project sub-area. The Department concludes that energy efficiency and demand response programs, independently or in combination with distributed generation, would not be sufficient to alleviate the modeled thermal overloads.

NSTAR has indicated that it favors the proposed project because it is less costly than Alternatives 1, 2 and 3, because it does not require extended outages of existing transmission lines or equipment during construction, and because it would have fewer environmental impacts than the alternatives. The record indicates that the proposed project is approximately half the cost of Alternative 1, and one-tenth the cost of Alternatives 2 and 3. In addition, the record shows that Alternative 1 might require the expansion of a substation into wetlands, that Alternative 2 likely would require extensive construction in congested streets, and that Alternative 3 would require outages of up to two months on each of two 115 kV lines serving the project area from the Brighton substation. The Department finds that the Company's decision to pursue the proposed transmission relocation project is reasonable, given its lower cost and environmental impacts, and the minimal impact on transmission system reliability

during the construction.

C. Impacts of the Proposed Project

In accordance with its responsibility to undertake a broad and balanced consideration of all aspects of the general public interest and welfare, the Department examined the impacts associated with the proposed transmission relocation project to identify any significant impacts that might occur during construction and operation of the project.

With respect to wetlands and endangered species, the record shows that pole installations for the proposed transmission relocation project would result in minor permanent alteration, displacing 21 square feet of wetland. Although project construction also would require equipment access across portions of seven wetlands, the impacts would be temporary, and limited to previously used dirt roads. As mitigation for wetlands impacts, the Company would replicate a wetland to replace permanently altered resources, and would use swamp mats to protect areas used for construction access. The Company would undertake restoration of any soils and vegetative cover disturbed during construction. The record indicates that the project area includes no rare or endangered species or exemplary natural communities.

With respect to land use and visual impacts, the record shows that the relocated transmission line would be installed within a ROW that, while abutting densely developed areas, is already encumbered by existing double-circuit towers and a number of power lines. Further, the Company would use a weathering steel monopole design, serving to minimize the incremental visual impacts of the project. In the event that property owners along the ROW are concerned by any changes in visual impact which may result from the project, the Company has committed to providing additional screening to mitigate such impacts upon

request from the affected property owners, and to providing contact information on its web site for property owners who may have such concerns. Further, the Company stated that it will communicate with affected property owners regarding any trees to be removed or pruned for the project. With respect to EMF, the record shows that the effect of the relocation project on maximum magnetic fields expected under peak load conditions would be an increase from 9.6 to 21.9 mG on the east side of the ROW, nearest the relocated transmission line, and a slight increase from 23.4 to 25.2 mG on the west side of the ROW, nearest the 230 kV line remaining on the double-circuit towers. These levels are significantly below both the EMF guidelines of the International Committee on Non-Ionizing Radiation Protection and the Institute of Electrical and Electronics Engineers, and the maximum edge-of-ROW guidelines for magnetic field level of 85 mG previously accepted by the Massachusetts Energy Facilities Siting Board.

With respect to traffic impacts, the record shows that minimal temporary disruption would occur during installation and removal of lines across roadways and rail lines, and at some businesses. Peak commuter periods would be avoided for operations at highway and railroad crossings. The Company has agreed to work with responsible officials and affected businesses, and to use public safely personnel at construction sites as warranted .

With respect to construction noise or other disturbances, the record shows that work would be limited to daylight hours. While maintaining the overall project time line may at times require use of extended hours during evening daylight periods or on Saturday, the Company has agreed to work with its contractor and any affected abutters to minimize disturbance resulting from use of such periods.

With respect to impacts to historical resources, the record shows that, based on results of its cultural resource survey, the Company concluded in a draft report to the MHC that no further investigation of cultural resources is warranted for the proposed project. To allow project construction, the concurrence of the MHC with the Company's cultural resources report is required.

D. Conclusion

The Department has found, above, both a need for, and public benefits of, the construction and operation of the relocated 115 kV transmission line. The Department also has found that NSTAR's decision to pursue the proposed project, rather than one of the identified alternatives, was reasonable. Based on its analysis in Section III.C., above, the Department finds that the public interest in the construction of the proposed project would outweigh the adverse environmental impacts (primarily construction noise and minor impacts to wetlands) of the project. Consequently, pursuant to G.L. c. 164, § 72, the Department finds that, with implementation of the mitigation measures proposed by NSTAR, the proposed 115 kV transmission relocation project is necessary for the purpose alleged, will serve the public convenience, and is consistent with the public interest.

V. ORDER

Accordingly, after due notice, hearing and consideration, it is hereby

ORDERED: That the proposed 115 kV transmission relocation project in the Towns of Framingham, Natick and Sherborn, as described in the petition and exhibits of Boston Edison Company d/b/a NSTAR Electric, is necessary for the purpose alleged, and will serve the public convenience and is consistent with the public interest pursuant to G.L. c. 164, § 72; and

it is

FURTHER ORDERED: That Boston Edison Company d/b/a NSTAR Electric work cooperatively with municipal, state, and railroad officials and affected property owners in Framingham, Natick and Sherborn to minimize any traffic, noise, visual or other local impacts associated with the proposed transmission relocation project; and it is

FURTHER ORDERED: That Boston Edison Company d/b/a NSTAR Electric provide all officials and property owners affected by the proposed transmission relocation project with telephone and web site information sources, and post thereon information on project schedules, mitigation available upon request, and contacts for complaints and requests; and it is

FURTHER ORDERED: That Boston Edison Company d/b/a NSTAR Electric shall obtain all other governmental approvals necessary for this proposed transmission relocation project before construction commences; and it is

FURTHER ORDERED: That Boston Edison Company d/b/a NSTAR Electric shall serve a copy of this Order upon the Conservation Commission, Selectmen, Town Clerk, and Planning Board of Framingham, Natick and Sherborn, Massachusetts, within five business days of issuance and shall certify to the Secretary of the Department within ten days of its issuance that such service has been accomplished.

By Order of the Department,

_____
Paul G. Afonso, Chairman

_____
James Connelly, Commissioner

_____
W. Robert Keating, Commissioner

_____
Judith F. Judson, Commissioner

_____
Brian Paul Golden, Commissioner

An appeal as to matters of law from any final decision, order or ruling of the Commission may be taken to the Supreme Judicial Court by an aggrieved party in interest by the filing of a written petition praying that the Order of the Commission be modified or set aside in whole or in part. Such petition for appeal shall be filed with the Secretary of the Commission within twenty days after the date of service of the decision, order or ruling of the Commission, or within such further time as the Commission may allow upon request filed prior to the expiration of the twenty days after the date of service of said decision, order or ruling. Within ten days after such petition has been filed, the appealing party shall enter the appeal in the Supreme Judicial Court sitting in Suffolk County by filing a copy thereof with the Clerk of said Court. G.L. c. 25, § 5.