The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC UTILITIES

D.P.U. 13-187/188 July 14, 2015

Petition of Western Massachusetts Electric Company pursuant to G.L. c. 40A, § 3, for Exemptions from the Zoning Bylaws of the Towns of Northfield and Erving and Petition of Western Massachusetts Electric Company and Petition of New England Power Company d/b/a National Grid for Approval pursuant to G.L. c. 164, § 72, to construct and operate a 115 kV overhead transmission line in Northfield and Erving.

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I. INTRODUCTION

A. Description of Proposed Project

Western Massachusetts Electric Company ("WMECO") and New England Power Company d/b/a National Grid ("NEP") (together, the "Companies") propose to construct and operate four related transmission system upgrades in the towns of Northfield and Erving ("Project"): (1) the expansion of the Northfield Mountain Substation and installation of a new 345/115 kilovolt ("kV") transformer, by WMECO ("Northfield Mountain Substation Expansion"); (2) a new switching station in Erving, by WMECO ("Erving Switching Station"); (3) a new 1.2-mile 115 kV overhead transmission line from Northfield Mountain Substation to the new Erving Switching Station, by WMECO ("New Line"); and (4) a new 115 kV loop line connecting NEP's existing overhead 115 kV A-127 Line to the proposed Erving Switching Station, by NEP ("Loop Line") (Exh. WMECO-1, at 1).

On January 31, 2014, WMECO filed a petition pursuant to G.L. c. 40A, § 3, for individual and comprehensive zoning exemptions from the Zoning Bylaws of the Towns of Northfield and Erving for work related to the Northfield Mountain Substation Expansion and the construction of the Erving Switching Station ("Zoning Petition") with the Department of Public Utilities (the "Department"). Also on January 31, 2014, NEP and WMECO jointly filed a petition for approval of the Project pursuant to G.L. c. 164, § 72 ("Section 72

Petition").[1] The Department docketed the matters as D.P.U. 13-187 and D.P.U. 13-188, respectively, and consolidated them for review (together the "Petitions").

As part of the Northfield Mountain Substation Expansion, WMECO would expand the fence line to install a 345/115 kV transformer (with three single-phase 200-megavolt ampere ("MVA") units), and add six new circuit breakers to facilitate the interconnection of the New Line (Exhs. WMECO-1, at 4, 42; WMECO-2, at 3). About 1.2 miles south of the Northfield Mountain Substation, adjacent to the intersection of WMECO's existing 345 kV 312 and 354 Lines and NEP's 115 kV A-127/B-128 Lines and 230 kV E205E Line, WMECO would construct the Erving Switching Station with three circuit breakers in a ring-bus configuration (Exh. WMECO-1, at 4, 42).

The New Line would connect the Northfield Mountain Substation and the proposed Erving Switching Station, running parallel to and 75 feet east of the existing 354 Line, along the west slope of Northfield Mountain (Exh. WMECO-1, at 4).[2] The 1,075-foot Loop Line would connect the existing A-127 Line into the proposed Erving Switching Station (id. at 5, 43). NEP would raise two of the existing E205E Line's transmission structures by

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[1] WMECO seeks Section 72 approval for construction of the New Line, which is clearly within the jurisdiction of the Department (Exh. WMECO-1, at 2). Regarding construction of the Loop Line, NEP seeks Department approval of its construction "to the extent that this construction might be considered subject to Section 72 jurisdiction" (Exh. WMECO-1, at 2).

[2] WMECO would also replace three existing 345 kV transmission structures adjacent to the Northfield Mountain Substation (one on the 312 Line and two on the 354 Line) with four new transmission structures to shift these lines westward to allow for the installation of the New Line (Exh. WMECO-1, at 4).

ten feet so that the Loop Line could pass underneath into the Erving Switching Station (id. at 5). The Project would be constructed entirely within the limits of property already owned by the Companies (id.).

The Companies stated that the Project would reinforce the transmission system in the Pittsfield-Greenfield area ("PGA"), an area that extends approximately from Pittsfield north to the Vermont border, east to Greenfield, and south to Amherst (Exh. WMECO-1, at 17). ISO New England ("ISO-NE") identified the Project as one element in a set of transmission projects necessary to bring the transmission system in the PGA into compliance with applicable national and regional reliability standards ("PGA Projects") (id.).

The Companies estimated that the Project would cost $74.9 million (Exh. WMECO-1, at 9). Project construction would take approximately 15 months, beginning in late 2015 and lasting through the end of 2016 (Exh. DPU-1-2).[3]

B. Procedural History

On April 10, 2014, the Department conducted a Project site visit in Northfield and Erving followed by a duly-noticed public hearing at the Erving Elementary School. No person or entity filed a petition to be admitted to these proceedings as either a party or as a limited participant.

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[3] The total estimated cost for all of the PGA Projects together is $146 million (Exh. WMECO-1, at 43). The Companies stated that they have already started work on some of the other the PGA Projects that do not require Department review. On November 4, 2014, NEP submitted a petition pursuant to G.L. c. 164, § 72, and G.L. c. 40A, § 3, for approval of the Cabot Taps Separation Project (D.P.U. 14-128/129), another component of the PGA Projects. The Companies expect to complete all of the PGA Projects by the end of 2016 (Exh. DPU-1-37).

The Companies submitted the prefiled testimony of the following witnesses: (1) James M. Clark of Northeast Utilities Service Company ("NUSCO"), who acted as the lead project manager (Exh. WMECO-JMC-1); (2) Paul M. Knapik, a project manager/wetlands scientist employed by BSC Group (Exh. WMECO-PMK-1); (3) Timothy Laskowski, transmission planning project manager for NUSCO (Exh. WMECO-TFL-1); (4) Robert E. Carberry, Northeast Utilities project manager for Massachusetts siting (Exh. WMECO-REC-1); and (5) William H. Bailey, Ph.D., principal scientist at Exponent, Inc. (Exh. WMECO-WHB-1). During the discovery phase, the Companies filed affidavits by John Bleyer, Dean Latulipe, Binoy Koodhathinkal, Russell Burke, and Peter Zschokke in support of responses to certain information requests that they had prepared (Exh. NEP-1).[4]

The Department conducted an evidentiary hearing at its offices in Boston on September 10, 2014. Messrs. Clark, Knapik, Laskowski, Carberry, Burke, and Koodhathinkal testified, as did Brian Benito, Jr., an environmental licensing and permitting specialist for NUSCO (Tr. at 4, 59, and 84). The evidentiary record of the proceeding includes the Companies' responses to 147 information requests and seven record requests. The Companies filed a joint brief on October 8, 2014 ("Joint Brief").

The Project is based on a Solutions Study for PGA, completed by ISO-NE in 2012 and reflects a needs assessment completed by ISO-NE in 2010 ("2010 Needs Study") (Exh. DPU-1-50). ISO-NE is currently preparing a new PGA solutions study ("Solutions Reassessment Study") based on its updated 2013 Needs Study (Exh. DPU-1-50). ISO-NE

[4] Messrs. Bleyer, Latulipe, Koodhathinkal, and Zschokke are employees of National Grid USA Service Company. Mr. Burke is Director of Planning at BSC Group.

presented its solutions reassessment work to its Planning Advisory Committee ("PAC") on April 28, 2015 (RR-DPU-1), but has not yet issued the study itself. In response to a Department record request, the Companies provided the presentation from the PAC meeting and outlined several changes to the Project (RR-DPU-1(1)).

II. REQUEST FOR INDIVIDUAL ZONING EXEMPTIONS PURSUANT TO G.L. C. 40A, § 3

A. Standard of Review

G.L. c. 40A, § 3, provides, in relevant part, that:

> Land or structures used, or to be used by a public service corporation may be exempted in particular respects from the operation of a zoning ordinance or by-law if, upon petition of the corporation, the [Department] shall, after notice given pursuant to section eleven and public hearing in the town or city, determine the exemptions required and find that the present or proposed use of the land or structure is reasonably necessary for the convenience or welfare of the public.

Thus, a petitioner seeking exemption from a local zoning by-law under G.L. c. 40A, § 3, must meet three criteria. First, the petitioner must qualify as a public service corporation ("PSC"). Save the Bay, Inc. v. Department of Public Utilities, 366 Mass. 667 (1975) ("Save the Bay"). Second, the petitioner must demonstrate that its present or proposed use of the land or structure is reasonably necessary for the convenience or welfare of the public. Massachusetts Electric Company, D.T.E. 01-77, at 4 (2002); Tennessee Gas Pipeline Company, D.T.E. 01-57, at 3-4 (2002) ("Tennessee Gas Pipeline Company (2002)"). Finally, the petitioner must establish that it requires exemption from the zoning ordinance or by-law. Boston Gas Company, D.T.E. 00-24, at 3 (2001).

1. Public Service Corporation

In determining whether a petitioner qualifies as a PSC for the purposes of G.L. c. 40A, § 3, the Massachusetts Supreme Judicial Court has stated:

> [A]mong the pertinent considerations are whether the corporation is organized pursuant to an appropriate franchise from the State to provide for a necessity or convenience to the general public which could not be furnished through the ordinary channels of private business; whether the corporation is subject to the requisite degree of governmental control and regulation; and the nature of the public benefit to be derived from the service provided. Save the Bay at 680. See also D.T.E. 00-24, at 3-4; Berkshire Power Development, Inc., D.P.U. 96-104, at 26-36 (1997).

The Department interprets this list not as a test, but rather, as guidance to ensure that the intent of G.L. c. 40A, § 3, will be realized, i.e., that a present or proposed use of land or structure that is determined by the Department to be "reasonably necessary for the convenience or welfare of the public" not be foreclosed due to local opposition. See D.P.U. 96-104, at 30; Save the Bay at 685-686; Town of Truro v. Department of Public Utilities, 365 Mass. 407, at 410 (1974). The Department has interpreted the "pertinent considerations" as a "flexible set of criteria which allow the Department to respond to changes in the environment in which the industries it regulates operate and still provide for the public welfare." D.P.U. 96-104, at 30; see also Dispatch Communications of New England d/b/a Nextel Communications, Inc., D.P.U./D.T.E. 95-59-B/95-80/95-112/96-113, at 6 (1998). The Department has determined that it is not necessary for a petitioner to demonstrate the existence of "an appropriate franchise" in order to establish PSC status. D.P.U. 96-104, at 31.

2. Public Convenience and Welfare

In determining whether the present or proposed use is reasonably necessary for the public convenience or welfare, the Department must balance the interests of the general public against the local interest. Save the Bay, 366 Mass. at 680; Town of Truro, 365 Mass. at 410. Specifically, the Department is empowered and required to undertake "a broad and balanced consideration of all aspects of the general public interest and welfare and not merely [make an] examination of the local and individual interests which might be affected." New York Central Railroad v. Department of Public Utilities, 347 Mass. 586, 592 (1964). When reviewing a petition for a zoning exemption under G.L. c. 40A, § 3, the Department is empowered and required to consider the public effects of the requested exemption in the state as a whole and upon the territory served by the applicant. Save the Bay, 366 Mass. at 685; New York Central Railroad, 347 Mass. at 592.

With respect to the particular site chosen by a petitioner, G.L. c. 40A, § 3, does not require the petitioner to demonstrate that its primary site is the best possible alternative, nor does the statute require the Department to consider and reject every possible alternative site presented. Rather, the availability of alternative sites, the efforts necessary to secure them, and the relative advantages and disadvantages of those sites are matters of fact bearing solely upon the main issue of whether the primary site is reasonably necessary for the convenience or welfare of the public. Martarano v. Department of Public Utilities, 401 Mass. 257, 265 (1987); New York Central Railroad, 347 Mass. at 591.

Therefore, when making a determination as to whether a petitioner's present or proposed use is reasonably necessary for the public convenience or welfare, the Department examines: (1) the present or proposed use and any alternatives or alternative sites identified; (2) the need for, or public benefits of, the present or proposed use; and (3) the environmental impacts or any other impacts of the present or proposed use. The Department then balances the interests of the general public against the local interest, and determines whether the present or proposed use of the land or structures is reasonably necessary for the convenience or welfare of the public. D.T.E. 00-24, at 2-6; D.T.E. 01-77, at 5-6; D.T.E. 01-57, at 5-6; Tennessee Gas Company, D.T.E. 98-33, at 4-5 (1998).

3. Exemption Required

In determining whether exemption from a particular provision of a zoning by-law is "required" for purposes of G.L. c. 40A, § 3, the Department makes a determination whether the exemption is necessary to allow construction or operation of the petitioner's Project. See D.T.E. 01-77, at 4-5; D.T.E. 01-57, at 5; Western Massachusetts Electric Company, D.P.U./D.T.E. 99-35, at 4, 6-8 (1999); Tennessee Gas Company, D.P.U. 92-261, at 20-21 (1993). It is a petitioner's burden to identify the individual zoning provisions applicable to the Project and then to establish on the record that exemption from each of those provisions is required:

> The Company is both in a better position to identify its needs, and has the responsibility to fully plead its own case . . . The Department fully expects that, henceforth, all public service corporations seeking exemptions under c. 40A, § 3 will identify fully and in a timely manner all exemptions that are necessary for the corporation to proceed with its proposed activities, so that the

> Department is provided ample opportunity to investigate the need for the required exemptions.

New York Cellular Geographic Service Area, Inc., D.P.U. 94-44, at 18 (1995).

B. Public Service Corporation Status

WMECO and NEP are electric companies as defined by G.L. c. 164, § 1, and, as such, are public service corporations. Western Massachusetts Electric Company, D.P.U. 09-24/25, at 7 (2010); New England Power Company, D.P.U. 12-02, at 7 (2012) ("Westborough"). Accordingly, the Department finds that WMECO and NEP qualify as public service corporations for the purposes of G.L. c. 40A, § 3.

C. Public Convenience and Welfare

1. Need for or Public Benefit of Use

The Companies stated that the Project is a necessary component of a broader effort to bring the PGA transmission system into compliance with applicable national and regional reliability standards (Exh. WMECO-1, at 10). The PGA transmission system is subject to standards and criteria that include the North American Electric Reliability Corporation's ("NERC") transmission planning standards TPL-001, TPL-002, TPL-003, and TPL-004; the Northeast Power Coordinating Council's ("NPCC") Regional Reliability Reference Directory Design and Operation of the Bulk Power System; and ISO-NE's Planning Procedure No. 3, Reliability Standard for the New England Area Bulk Power Supply System (Exh. WMECO-1,

at 10).[5] The Companies stated that all components of the proposed Project are subject to bulk power system standards (Exh. DPU-1-21).

a. Description of the Existing System

WMECO and NEP both own transmission facilities in the PGA region (Exh. WMECO-1, at 17). Transmission system voltages in the area are 345 kV, 230 kV, 115 kV, and 69 kV, and the major generating units in the area include the Northfield Mountain and Bear Swamp pumped storage plants and the Altresco combined-cycle generating facility (id. at 17). The area from the Montague Substation to the Berkshire Substation is served by paired 115 kV transmission lines, which are approximately 90 years old and have a low capacity (id. at 18; Tr. at 27). The area south from the Montague Substation to the Podick and Amherst Substations is served by another pair of 115 kV transmission lines (Exh. WMECO-1, at 18). At the Montague Substation, these two pairs of WMECO 115 kV lines are also connected to the taps of NEP's 115 kV B-128 and Y-177 Lines ("Cabot Taps") (id.). The closest available points of 345 kV support to the 115 kV system in the Montague area are at the Berkshire Substation near Pittsfield and the Ludlow Substation near Springfield (id.; Exh. DPU-1-24(1)). In the immediate area of the Project, WMECO's 345 kV 312 and 354 Lines cross, but do not interconnect with, NEP's 230 kV E205E Line and 115 kV A-127/B-128 Lines (Exh. WMECO-1, at 4, 17, exh. 3.1).

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[5] The PGA transmission system is also subject to relevant WMECO and NEP transmission planning standards: the Transmission Planning Guideline for Northeast Utilities and the Transmission Group Procedure 28 for the United States operations of National Grid (Exhs. WMECO-1, at 10; DPU-1-20).

b. Needs Assessment Assumptions

ISO-NE's *Pittsfield-Greenfield, MA Area Transmission 2022 Needs Assessment* (published in December 2013) ("2013 Needs Study") analyzed the reliability-based transmission needs in the PGA for projected system conditions in 2022 (Exh. WMECO-1, exh. 4.1, at 1). The 2013 Needs Study used the ISO-NE 2012 Capacity, Energy, Loads, and Transmission ("CELT") forecast to project 2022 loads for the PGA substations (id. at 22).[6] To assist ISO-NE in distributing forecast loads among the substations, each operating company provided its historical substation peak loads to ISO-NE along with any anticipated future load transfers due to a new substation or an existing substation approaching substation capacity (Exh. DPU-2-6; Tr. at 15-16). The load at each substation included the expected reductions from energy efficiency ("EE") and demand response ("DR") (Exh. WMECO-1, at 22).[7]

ISO-NE analyzed system peak, shoulder, and low load conditions in the PGA in the 2013 Needs Study (Exh. WMECO-1, at 23). To estimate the summer peak load, ISO-NE used its 90/10 load forecast, the load level for which ISO-NE estimates actual peak load has only a

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[6] The Companies contend that it would be premature to include any impacts of grid modernization or time-varying rates on load forecasts for projects that are needed in the near term (Exh. DPU-2-13). The Companies noted that implantation of grid modernization and time-varying rates in the PGA region remains uncertain until the Companies submit such plans to the Department sometime after mid-2015 and the Department approves the Companies' plans (id.).

[7] The forecast includes the existing amount of DR and EE based on Forward Capacity Auction 7 ("FCA 7"), plus ISO-NE's forecast for the increase in savings from EE between FCA 7 and 2022 (Exh. WMECO-1, at 22). Under ISO-NE's planning procedures, 100 percent of the forecasted EE contributes to peak load reduction, while only 75 percent of DR contributes to peak load reduction, based on ISO-NE's historical operating experience (Exh. WMECO-1, at 22, 32).

ten percent chance of exceeding (id. at 18). ISO-NE defined shoulder load conditions as 75 percent of the 50/50 load forecast (id. at 23). ISO-NE studied shoulder load conditions in the PGA because the pumped hydro units in the area could be restoring water levels during shoulder load conditions (id. at 23, exh.4.1, at 2). Finally, ISO-NE also tested a minimum load condition due to concerns about potential related high-voltage violations (id. at 23).

ISO-NE tested seven local (i.e., PGA) generation dispatch scenarios (shown below in Table 1) in combination with various New York to New England and New England East-West power transfer levels (Exh. WMECO-1, exh. 4.1, at 2, 15). For N-1-1 contingencies, ISO-NE allowed generator redispatch up to 1,200 MW after the first contingency event and prior to the second contingency; the 1,200 MW limit was based on the amount of additional generation typically available on the system (id. exh. 4.1, at 23).[8,9]

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[8] An N-1 contingency is a circumstance in which there is an unexpected fault or loss of a single electric element. An N-1-1 contingency consists of the loss of such an element, followed by non-simultaneous loss of an additional element.

[9] The Companies stated that generator redispatch is not considered to be a good alternative based on economic dispatch and system operations considerations; however, regional reliability standards allow generator redispatch after a contingency event (Exh. WMECO-1, at 37, exh. 4.1, at 23).

Table 1. Generation Dispatch Scenarios for 2013 Needs Study

Generators	**Peak Load Scenarios**				**Shoulder Load Scenarios**		**Minimum Load**
Scenario Number	1	2	3	4	5	6	7
Bear Swamp 1 and 2	100%	Off	Off	50%	Pumping*	Pumping*	Off
Altresco Combined Cycle	100%	Off	100%	Off	100%	Off	Off
Northfield Mountain 1-4	100%	75%	75%	50%	Pumping*	Pumping*	Off

Source: Exh. WMECO-1, at 24.

* Note: The shoulder load scenarios were modeled to test the condition of the nighttime between peak summer days when the pumped storage units may be in full pumping mode to restore water levels (Exh. WMECO-1, exh. 4.1, at 16).

c. Pittsfield-Greenfield Area Overloads and Violations

Based on the generator dispatch and transfer level scenarios tested, the 2013 Needs Study found that, in the PGA region in the study year 2022, high and low voltage violations would occur following certain N-1 and N-1-1 contingencies, and thermal overloads would occur following certain N-1-1 contingencies (Exh. WMECO-1, at 25-26, exh. 4.1, at 4).[10,11]

[10] Thermal overloads occur when the loading on a transmission line exceeds emergency ratings (Exh. DPU-2-8; Tr. at 17). Voltage violations occur when the voltage on a transmission line or substation is either five percent above (high-voltage violation) or five percent below (low-voltage violation) the target voltage (Tr. at 17).

[11] ISO-NE found fewer thermal overloads and low-voltage violations in the 2013 Needs Study than in its earlier 2010 Needs Study due to a significant increase in demand response and energy efficiency in the Western Central Massachusetts Load Zone between the two studies (Exhs. WMECO-1, at 25-26; DPU-1-30). ISO-NE did not test for high-voltage violations in the 2010 Needs Study, but it found several N-1 and N-1-1 high-voltage violations in the 2013 Needs Study (Exh. WMECO-1, at 25-26, exh. 4.1, at 26-30).

Nearly all of the contingency violations identified in ISO-NE's 2013 Needs Study already existed in 2013 (id. at 26, exh. 4.1, at 26). The Companies asserted that the violations will become more severe by 2022 based on their expectation that PGA loads will grow (Exh. DPU-1-32).

Based on these thermal overload and voltage violations, the Companies testified that there is currently a risk they would have to interrupt electric power to customers in the PGA after certain contingencies. The Companies indicated that the potential to interrupt electric supply to customers exists, even with generator redispatch (Tr. at 26).[12]

The Companies also studied the thermal and voltage violations that would persist in the PGA if the other proposed PGA Projects were built, but not the Project (Exhs. DPU-1-34; DPU-2-8). The Companies stated that even with the other system upgrades, and 1,200 MW of generator redispatch, the Project would still be necessary to address numerous N-1-1 thermal overloads on the 115 kV 1231 and 1242 Lines between the Montague and Berkshire Substations (Exh. DPU-2-8; Tr. at 17). Additionally, the Companies found that without the Project, there would be low-voltage violations (i.e. less than 95 percent of nominal) at numerous substations in the PGA for certain N-1-1 contingencies (Exh. DPU-2-8; Tr. at 17). For some N-1-1 contingencies, the low-voltage violations remaining without the Project have the potential to lead to voltage collapse (Exhs. WMECO-1, at 25; DPU-2-8).

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[12] The Companies stated that contingencies have already occurred that could have caused thermal or voltage violations. However, system operators were able to secure the system by running out-of-merit generation and limiting power transfers to avoid violations (Exh. DPU-1-33).

d. Analysis and Findings

In the 2013 Needs Study, ISO-NE found numerous potential thermal overloads and voltage violations in the PGA under certain contingencies scenarios. The PGA transmission system is already vulnerable to almost all of these potential overloads and violations, creating the risk that the system operators would have to drop customers under certain contingencies. Generator redispatch would be inadequate to resolve potential overloads and violations in the PGA for all contingencies scenarios, and violations are expected to get worse by 2022, as peak load increases.[13]

Furthermore, the Companies presented evidence that if the proposed PGA Projects were constructed, but not this Project, the regional transmission system would still be vulnerable to numerous thermal overloads and low-voltage violations for certain N-1-1 contingencies, even with generator redispatch. The Companies must eliminate the potential for these overloads and violations in order to comply with applicable federal and regional reliability standards.

On the basis of the existing potential for thermal overloads and voltage violations under certain contingencies the Department finds that there is need for the Project, and that by meeting this need the construction and operation of the Project would result in public benefits.

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[13] At this time, peak load reduction benefits of grid modernization and time varying rates are not sufficiently known to be incorporated into the load forecast. The Department looks forward to working with the Companies and ISO-NE to incorporate the impacts of grid modernization and time-varying rates in future transmission planning studies.

2. Alternatives Explored

The Companies evaluated Project alternatives on two levels: first, they evaluated transmission alternatives to meet the overall identified needs of the PGA region through four alternative sets of transmission solutions, and selected a suite of projects that included the subject Project; second, they evaluated alternatives to the Project, including non-transmission alternatives ("NTAs"), that would meet the need remaining after the other PGA solution elements were assumed to be constructed (Exhs. WMECO-1, at 27; DPU-1-35; DPU-1-36). The Companies' analysis of Project-specific NTAs included: (1) central generation; (2) energy efficiency; (3) demand response; (4) energy storage; and (5) grid modernization measures (Exhs. WMECO-1, at 27-28; DPU-2-13; DPU-2-14).

a. Transmission Alternatives to PGA Projects

i. ISO-NE's Four Transmission Alternatives

The Companies provided four sets of transmission solutions (Alternatives A through D) developed by ISO-NE in its Pittsfield-Greenfield, MA Area Transmission Solutions Study Report (published in March 2012) ("Solutions Study") to meet the identified need (Exhs. WMECO-1, exh. 4.3; DPU-1-50). ISO-NE stated that it sought alternative solutions to either replace and increase the capability of existing facilities or install new facilities in other parts of the system that would relieve the existing stressed facilities (Exh. WMECO-1, exh. 4.3, at 24). Its goal was to keep the replacement or installation of new facilities to a minimum while solving the system weaknesses and taking cost into consideration (id.).

ISO-NE selected Alternative D (which includes the Project) as its preferred suite of transmission solutions (Exh. WMECO-1, at 27, exh. 4.3, at 2). ISO-NE selected Alternative D primarily based on its estimated cost, which would be substantially less than the estimated cost of the other alternatives (id. exh. 4.3, at 3). ISO-NE also stated that it expected siting, permitting, and construction time for Alternative D to be less than for the other alternatives evaluated (id.).

WMECO provided an analysis of the environmental and community impacts of the alternatives based on a desktop review of relevant data (Exh. WMECO-1, at 48). WMECO evaluated each of the alternatives based on the following criteria: (1) land use impacts and the need for acquisitions; (2) traffic impacts; (3) noise impacts; (4) aesthetic and visual impacts; (5) wetlands and water resources impacts; (6) ground water protection areas; (7) rare species; (8) oil and hazardous materials; (9) tree removal; and (10) historic and archaeological resources (id.).

The Companies argue that Alternative D (the Project) is superior in almost all evaluation criteria due to a significantly shorter construction route, in addition to costing approximately $70 million less than any other alternative (Exh. WMECO-1, at 61).

ii. Solutions Reassessment Study

The existing Solutions Study, published March 2012, is based on a needs assessment completed by ISO-NE in 2010 (Exh. DPU-1-50). ISO-NE presented its 2013 Solutions Reassessment Study to its Planning Advisory Committee ("PAC") on April 28, 2015 (RR-DPU-1), but has not yet issued the study itself. The Companies stated that ISO-NE

decided to do the Solutions Reassessment Study to address potential high-voltage violations found in the 2013 Needs Study that had not been identified in the 2010 Needs Study and to determine whether a shunt reactor at Northfield Mountain Substation would be needed (Exhs. WMECO-1, at 4; DPU-1-8; Tr. at 18, 37).[14] Additionally, the Companies stated that while ISO-NE did not include new solar photovoltaics ("PV") as a type of distributed generation in the forecast used for the 2013 Needs Study, a PV forecast would be included in the Solutions Reassessment Study (Exh. DPU-2-16).

The PAC presentation slides indicate that the reassessment modeled 88.5 MW of PV in western Massachusetts (RR-DPU-1(1) at 9). The reassessment found potential high and low voltage violations in an N-1 scenario and voltage and thermal violations in N-1-1 scenarios in the PGA and that these needs existed before 2013 (id. at 13-14). The PAC slides also indicate that during the reassessment ISO-NE revisited the four transmission alternatives for addressing the identified need in the PGA, and stated that Alternative D remained the preferred solution for the area (RR-DPU-1(1) at 16, 34; Exh. WMECO-1, at 42-43).[15] Specifically, ISO-NE identified the Project (constructing a new 115 kV switching station at Erving and expansion of

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[14] The reassessment determined that 75-150 MVAR variable shunt reactors should be installed at both Northfield and Ludlow Substations (DPU-RR-1(1) at 29). Therefore, for purposes of this Order we consider the shunt reactors at Northfield Substation as being part of the Project.

[15] The preferred solution as set forth in the PAC presentation included some additional upgrades not originally included in Alternative D: e.g., addition of a capacitor bank and the operation of a breaker at the Doreen 115 kV substation (RR-DPU-1(1) at 35). Furthermore, the PAC presentation stated that two components of Alternative D were no longer required: (1) reconductoring of the 1371 line; and (2) replacing a 115 kV breaker at Harriman substation (id. at 16).

the Northfield Mountain substation with a new 345/115 kV transformer) as part of its "Final Selected Solution" for the Pittsfield-Greenfield area (RR-DPU-1(1) at 34).

b. Project-Specific Transmission Alternatives

The Companies indicated that there were no feasible variations within Alternative D (Exh. WMECO-1, at 27). However, the Companies did respond to questions about constructing a 115 kV tap line directly from the expanded Northfield Mountain Substation to the A-127 Line (without constructing the Erving Switching Station). In so doing, the Companies stated that such a modification would be less reliable because a tap line from the Northfield Mountain Substation would make the 70-mile long A-127 Line a four-terminal or five-terminal line (Exhs. DPU-1-36; DPU-2-10). The Companies stated that adding additional terminals to a transmission line requires an increase in equipment, and further that each new piece of equipment has the potential to fail or operate incorrectly (Exh. DPU-2-10). The Companies stated that multiple-terminal lines require complex protection relay systems and it would be difficult to adequately protect a four- or five-terminal line. In addition, the record notes that the Institute of Electrical and Electronics Engineers ("IEEE") does not recommend lines with more than three terminals (Exh. DPU-2-10; Tr. at 31).[16]

c. Non-Transmission Alternatives

i. New Central Generation

The Companies stated that siting large generators in specific locations could reduce power flows on existing overloaded transmission lines sufficiently to alleviate the need for new

[16] The Companies' witness testified that he was unaware of any four- or five-terminal lines in New England (Tr. at 32-33).

transmission infrastructure (Exh. WMECO-1, at 28). Specifically, the Companies stated that 50 MW of new generation at the Montague Substation could replace the Project (Exh. DPU-1-39).[17] Unlike the Project, this alternative would still require redispatching large amounts of generation in some contingencies (Exhs. WMECO-1, at 37; DPU-1-39). WMECO stated that it would only have space for 40 MW of generation capacity at the Montague Substation, and there would be no room for further expansion or visual buffering (Exh. DPU-1-49). The Companies estimated that 50 MW of quick-start generation would cost $102.6 million, compared to an estimated Project cost of $74.9 million, both with a target accuracy of -25/+50 percent (Exhs. WMECO-1, at 9; DPU-2-11). However, the cost estimate for the generation alternative does not include potential costs for land acquisition costs, siting and permitting, or a contingency allowance (Exh. DPU-2-11). Additionally, the Companies stated that there is no generation like this in the interconnection queue so it would take several years before this alternative could be developed, permitted, and installed (Exh. WMECO-1, at 38).

ii. Energy Efficiency, Demand Response, Energy Storage, and Grid Modernization

The Companies stated that reducing peak demand sufficiently could alleviate the need for transmission infrastructure (Exh. WMECO-1, at 28). The Companies stated that one way to reduce peak demand would be through EE programs that lower system demand during peak

[17] ISO-NE uses a long-term planning assumption that only 80 percent of quick-start resources would successfully start-up (Exh. DPU-1-39). The Company stated that its estimate of 50 MW accounts for this planning assumption (Exh. DPU-1-39).

hours in the summer and winter (id. at 27). The Companies estimated that approximately 67 MW of targeted EE measures beyond what is already forecast would be required to eliminate the need for the Project (Exh. DPU-1-39).

ISO-NE's estimate of 90/10 peak PGA region load for the year 2022 PGA region is 488 MW (Exh. WMECO-1, at 30). As of ISO-NE's 2013 Forward Capacity Auction ("FCA"), the total amount of EE in the PGA was approximately 28 MW (id. at 29-30). ISO-NE forecasts that there would be approximately 20 MW of additional EE by 2022, for a total of 48 MW by 2022 (id. at 30). The Companies assert that even with unlimited funding, it would be difficult to achieve the level of EE necessary to replace the Project (id. at 35).

Another way to reduce peak demand would be through DR, such as interruptible load that ISO-NE can dispatch (Exh. WMECO-1, at 28). The Companies estimated that 84 MW of additional DR would be required to obviate the need for the Project (Exh. DPU-1-39).[18] As of the 2013 FCA, the PGA region had a total of approximately 22 MW of DR resources, and ISO-NE used that level of DR as a forecast for 2022 in the 2013 Needs Study (id. at 30; DPU-1-46). The Companies argued that with peak-load growth, DR resources would be called on more often, which could lead to reduced participation in the future (Exh. WMECO-1, at 35). The Company stated that either EE or DR alternatives to the Project would also require generator redispatch to eliminate all the thermal overloads and voltage violations, which the

[18] A larger amount of DR than EE would be needed to replace the Project because ISO-NE assumes that only 75 percent of DR resources successfully respond to dispatch orders, based on ISO-NE's historic operating experience (Exh. WMECO-1, at 32).

Companies argued, while technically feasible, would have negative impacts on economic dispatch and system operations (id. at 32-33; Tr. at 29).

The Companies also investigated the potential for energy storage technology to replace the Project (Exhs. DPU-1-43; DPU-2-14).[19] The Companies stated that utility-scale batteries would have a high cost and limited lifetime compared to the Project (Exh. DPU-2-14). For another Massachusetts project proposal, NSTAR Electric, which is an affiliate of WMECO, obtained estimates for a 12 MVA, 72 MWh battery storage system raging between $48 million and $168 million (id.).[20] The Companies stated that four such systems would be required to replace the Project (Tr. at 33-34). Additionally, the Companies stated that these battery storage systems would have an expected lifetime of less than 20 years, significantly less than the lifetime of the Project facilities (Exh. DPU-2-14). Furthermore, unlike a generation alternative, the battery storage systems would only be able to operate for six hours at full capacity without recharging, rendering this alternative impractical with respect to those contingencies lasting more than six hours (id.; Tr. at 33-34).

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[19] The Companies stated that increasing the capacity of the Northfield Mountain pumped storage plant would not address the need for the Project. If the Project were not built, the grid operator would actually need to reduce the output of the Northfield Mountain pumped hydro storage plant to maintain system reliability in many contingency scenarios (Tr. at 33).

[20] NSTAR secured pricing for energy storage facilities from five suppliers (Exh. DPU-2-14). Four of the estimates were for a total cost of $56.6 million, $52 million, $48 million, and $68 million, respectively, while a fifth estimate was $8.4 million per year for 20 years (Exh. DPU-2-14).

The Companies also evaluated ice-based thermal storage devices, which are on-site cooling systems that make ice during off-peak hours and use the ice as a cooling source for up to six hours during peak periods to reduce electric demand for air conditioning (Exh. DPU-2-15). A 2010 pilot project with four of Ice Energy's "Ice Bear 30" units at a Staples facility found that each unit could reduce peak demand by approximately 5 kW over a six-hour period (id.). Therefore, the Companies estimated that 10,000 units would be needed to provide the necessary load relief for six hours, requiring thousands of suitable customers and costing between $110 million and $125 million upfront, plus annual maintenance costs (id.). The Companies stated that the expected lifetime of the ice storage units would be 20 to 25 years (id.). The Companies stated that based on the cost and the expected unit lifetime, ice storage would not be a viable alternative to the Project (id.).

d. Analysis and Findings

Based on Alternative D's costs, which are significantly lower than the other alternatives, and on its limited environmental impacts (see section II.C.3 below), the Department concludes that it is superior to the other alternatives explored by ISO-NE for meeting the need identified in both the 2010 Needs Study and in the recent PAC presentation. The evidence described above also indicates that the Project is superior to constructing a 115 kV tap line directly from Northfield Mountain Substation based on reliability considerations.

A centralized generation alternative would be more costly than the Project and would cause a longer delay in meeting the identified current need. The Department agrees with the

Company that it would likely be unable to obtain 67 MW of targeted EE by 2022 beyond what is already forecast in the 488 MW load zone, nor a similar amount of DR. Furthermore, the energy storage alternatives presented would be more costly than the Project, with a shorter lifespan.[21]

Accordingly, the Department finds that the Companies' decision to pursue the Project, rather than pursing the other alternatives, is reasonable.

3. Impacts of the Proposed Use

In accordance with its responsibility to undertake a broad and balanced consideration of the general public interest and welfare, the Department examines the potential impacts associated with the Project. As described above in Section I.A, Project construction would take approximately 15 months, beginning in late 2015 (Exh. DPU-1-2). The Companies stated that on-site staffing could peak at 75 workers when work is occurring simultaneously on the New Line, the Northfield Mountain Substation, and the Erving Switching Station (Exh. DPU-1-5).

At the start of construction, the Companies would set up field construction yards and staging and laydown areas and then prepare the site for construction by installing erosion and sedimentation controls, removing vegetation, improving access roads, constructing new access

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[21] The Company did not present a distributed generation alternative in this case; the Company should explore the opportunity for distributed generation, such as solar photovoltaics to avoid or delay the need for future projects. In general, the Companies should continue to explore creative ways to use non-transmission alternatives (individually or in combination) to avoid or delay the need for new transmission infrastructure.

routes to structure locations, and installing crane pads (Exh. WMECO-1, at 6). The Companies would excavate and construct foundations, and then erect new structures (id.).[22] Finally, the Companies would install conductors and shield wires before performing site clean-up and restoration, including re-vegetation of disturbed areas (id.). The Companies do not anticipate any customer outages associated with Project construction, testing, or commissioning (Exh. DPU-1-3).

Typical construction work hours would be from 7:00 a.m. to 7:00 p.m. on Monday through Saturday (Exh. DPU-1-89). The Companies stated that they would like to have the option to work additional hours and/or on Sundays: (1) in response to severe weather events; (2) to minimize equipment outages; and (3) for indoor work (id.). The Companies committed to provide the impacted town(s) 24-hour advance notice of any planned work outside of the normal work hours for these reasons, and to coordinate with town officials on any planned work outside of normal work hours for any unanticipated reasons (id.).

The Companies have met with town officials from Northfield and Erving, including the Board of Selectman, the Zoning Board of Appeals, and the Planning Board of each town (Exhs. WMECO-2, at 16-18; DPU-1-7). The Companies stated that they would meet with town officials again once the final drafts of the construction plans are completed and that at those meetings they would solicit feedback on topics including work hours, vehicular access,

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[22] The Companies stated that their preferred methods for excavation of rock would be mechanical hammering or ripping (Exh. WMECO-1, at 69). The Companies do not anticipate using blasting to excavate rocks, but stated that if necessary any blasting would be performed by licensed blasting contractors pursuant to all applicable regulations (id.).

emergency vehicle access, equipment delivery, and laydown areas (Exh. DPU-1-6). The Companies also committed to send letters to all property owners that are "most likely to notice the construction activity" (regardless of whether they directly abut the Project) explaining the construction plan and providing a contact phone number and email address (id.). WMECO stated that it is engaged in ongoing conversations with FirstLight Energy Power Resources ("FirstLight"), the only business in the immediate vicinity of the Project, which would continue throughout construction and restoration (id.).

a. Land Use Resources

The Project area is surrounded by upland forest, and FirstLight operates a pumped storage hydroelectric plant, as well as an outdoor recreational facility called the Northfield Mountain Recreation and Environmental Center ("NMREC") in the vicinity of the Project (Exhs. DPU-1-7; DPU-1-53). NMREC includes a network of trails for hiking, biking, and cross-country skiing (Exhs. WMECO-1, at 64). The closest land use receptors to the Project are private residences and NMREC's Visitor Center ("Visitor Center") (Exh. DPU-1-53). The Visitor Center is 600 feet from the Northfield Mountain Substation (id.). At its closest point, the New Line would be 925 feet from the nearest residence, while the nearest residences to the Northfield Mountain Substation and the Erving Switching Station would be 1,690 feet and 1,512 feet, respectively (id.).

The Companies would construct the Project entirely within property owned by the Companies (Exh. WMECO-1, at 5).[23] Some of the Project area owned by WMECO contains cross-country ski trails that are managed by FirstLight as part of NMREC (Exh. DPU-1-70). FirstLight manages all the recreational facilities associated with NMREC and owns the lands where the Visitor's Center and many of the NMREC trails are located (id.). During construction of the Project, access to several NMREC trails would be temporarily restricted or rerouted; a portion of two trails (the Hidden Quarry and Tenth Mountain trails) would be permanently rerouted as a result of the Project (Exh. DPU-1-71). The Companies developed a Trail Use and Closure Plan with the input and support of NMREC to minimize the impact of the trail closures and reroutings (Exh. DPU-2-25).

As a result of the Project, the Companies would alter approximately 26 acres of transmission line corridor and upland forests (Exh. WMECO-1, at 66). Eleven acres of upland forest would be cleared for the New Line, with some additional clearing of upland forests for the Northfield Mountain Substation Expansion and the construction of the Erving Switching

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[23] WMECO has granted survey permission to the Tennessee Gas Pipeline Company, L.L.C. ("TGP") for its proposed Northeast Energy Direct project for the WMECO-owned parcels along the Project route between the Northfield Mountain Substation and the proposed Erving Switching Station (Exhs. DPU-1-15; DPU-2-3). WMECO stated that it does not have sufficient information to determine where on its property TGP is considering locating a natural gas pipeline (RR-DPU-3). WMECO stated that it generally prefers natural gas pipelines to be as far away from transmission lines as possible to avoid current entering the ground from a fault or lightning strike at transmission structures and to avoid inducing voltages on the pipeline from the magnetic field of the transmission lines (Tr. at 43, 48). The Companies anticipated that the Project would be completed before TGP might construct a natural gas pipeline in the area (Tr. at 45).

Station (id. at 67).[24] WMECO stated that it would use mowing and/or selective application of herbicide to enable low-growing scrub and shrub native plants to dominate the cleared New Line corridor (id.; Exh. DPU-1-58).[25] The Companies stated that the upland forest habitat that would be cleared for the Project is common in the region and would result in negligible long-term impacts (Exhs. WMECO-1, at 67; DPU-1-58; DPU-1-60). The Companies stated that the Project area contains no mapped Estimated or Priority Habitat for state-listed rare species (Exh. WMECO-1, at 72).

The Companies hired an archaeological consultant to analyze available information on cultural resources along the Project route (Exh. WMECO-1, at 78). Most of the study area has low potential to contain Native American archaeological sites or other historical archaeological sites due to the steep slopes along the Project route (Exh. DPU-1-87). There are, however, several areas along the Project-route with moderate or high potential to contain archaeological sites, and there is one recorded Native American site (id.). The Companies stated that no work would be performed in the vicinity of the recorded site (id.). The Companies also stated that they would consult with the Massachusetts Historical Commission if

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[24] The New Line would be constructed to the east of the existing 354 Line (which is the easterly of the two existing lines) and would require approximately 65 feet of additional clearing (Exh. WMECO-1, at 71). Currently, each of the existing 345 kV transmission lines has a cleared area approximately 120 feet wide with shrub and grassland habitat beneath it. A forested strip with an average width of 80 feet separating the two lines would remain (id.).

[25] WMECO stated that it would follow an Integrated Vegetation Management Plan, in which it typically implements selective herbicide application a year after mowing (Exh. DPU-1-58). WMECO typically applies herbicide selectively to species targeted as incompatible with transmission lines due to the height of the species at maturity (id.).

they conducted earth-disturbing activities in the areas identified as having potential for archaeological resources (Exh. WMECO-1, at 79).

The Companies argue that the construction and operation of the Project would have no permanent effect on the existing pattern of land use in the Project area (Companies' Brief at 34).

b. Visual Impacts

The Companies stated that a stand of mature white pine trees largely obstructs views of the Northfield Mountain Substation from surrounding roadways and public areas (Exh. DPU-1-76). The Companies also stated that the only structures at the substation that would be visible from any local roadways and public areas would be the transmission line terminal structures (id.). The existing terminal structures are 133 feet above grade while the tallest new terminal structure at the Northfield Mountain Substation would be 119 feet above grade (Exh. DPU-1-104).

The overall form of the Erving Switching Station would be visible from several vantage points, including Pisgah Mountain Road and River Road in Gill, and the Northfield Mount Hermon School, although the Company stated that from these vantage points a viewer would be unable to make out the individual components of the switching station (Exh. DPU-1-72; Tr. at 52). The maximum structure height at the Erving Switching Station would be 78.5 feet above grade (Exh. DPU-1-104).

The New Line would be built adjacent to the existing 312 and 354 Lines, two overhead 345 kV transmission lines that are supported by wood- and steel-pole H-frame structures that

range in height from 61 to 97 feet (Exhs. WMECO-1, at 71; DPU-1-105(1)). Steel-monopole structures up to 103 feet tall would support the New Line (Exhs. WMECO-1, at 4; DPU-1-105).[26] The height of the New Line's transmission structures would vary, but the Companies stated that they selected structure heights to accommodate the undulating topography while maintaining a generally level line profile (Exh. DPU-1-105).

The Company stated that, like the existing 345 kV transmission lines, the New Line would generally be shielded from public view by Northfield Mountain to the east and the wooded buffer between the lines and the nearest public roadway to the west (Exh. DPU-1-75). The Companies acknowledged that as the New Line approaches the Erving Switching Station some portion of the wider corridor may be visible from nearby locations, such as the Northfield Mount Hermon School and some locations on the Connecticut River (id.).

The lighting at the new Erving Switching Station would face downward and the yard lighting for the expansion of the Northfield Mountain Substation would use similar fixtures to the existing lighting (Exh. DPU-1-77). All of the new lighting added as part of this Project would normally be turned off (id.).[27]

c. Wetlands and Water Resources

WMECO conducted a field investigation of all the wetlands in the Project area (Exh. WMECO-1, at 72, 74). The New Line would pass in close proximity to three federally

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[26] The maximum pole height for the Loop Line is expected to be 56 feet (Exh. DPU-1-105).

[27] No FAA lighting is required as part of this Project, either at the stations or on any of the transmission line structures (Exh. DPU-2-26).

recognized vegetated wetlands, which are also regulated as Bordering Vegetated Wetlands under the Massachusetts Wetlands Protection Act (id. at 73). The Project would pass overhead along the eastern edge of one wetland, but would avoid any direct wetland crossings and would avoid the placement of new structures in any of the wetland areas (id. at 75-76; DPU-1-78).

The Project would cross five intermittent stream channels that are generally open channels in the transmission line corridors, but are conveyed beneath existing access roads via culverts (Exh. WMECO-1, at 75). Generally, the Project would avoid permanent stream crossings and the Companies would install temporary mat bridges if it were necessary to cross streams during tree clearing and removal (id.). The Companies stated that they would attempt to install these temporary crossings so as to minimize disturbance to the stream banks and to remove the temporary bridges immediately after the completion of tree clearing operations (id. at 75-76).

No Project work would occur within, or proximate to, any potential or certified vernal pool (Exh. WMECO-1, at 76). No part of the Project area is within the 100-year floodplain (Exh. WMECO-1, at 74).

The Companies committed to install suitable erosion and sedimentation control measures during construction, such as silt fences, straw bales, filter socks, mulching, and reseeding (Exh. WMECO-1, at 67). The Companies stated that their erosion and sedimentation measures would be consistent with MassDEP's 2003 Erosion and Sediment Control Guidelines for Urban and Suburban Areas, as well as the U.S. Environmental

Protection Agency's ("USEPA") National Pollutant Discharge Elimination System, which would require the Project to develop a stormwater pollution prevention plan (id. at 67, 70).

d. Traffic

The Project would not cross any public roadways (Exh. WMECO-1, at 76). WMECO stated that it anticipates the need for traffic control when it transports oversized loads, such as a prefabricated control enclosure or new transformer components, to the Project site by public roads (Exh. DPU-1-82). WMECO has committed to notifying state and local authorities and working with them to ensure the safe transportation of these oversized loads, including by utilizing police details as necessary (Exhs. DPU-1-65; DPU-1-82). WMECO also stated that it would develop an access and traffic control plan for its construction contractor(s) to provide safe entry and exit to the Project site (Exh. WMECO-1, at 77).

For Project construction, WMECO would upgrade the existing gravel access road along the 312 Line corridor ("312 Access Road"), supplemented with spur roads, as the main construction route for the New Line (Exh. DPU-1-61). To reach the 312 Access Road, WMECO would install a temporary, unpaved access road ("Temporary Access Road") on its property from Route 63 to the Northfield Mountain Substation over what is currently part lawn and part unpaved trail (id.). WMECO would use this Temporary Access Road to minimize impacts on FirstLight, since FirstLight employees need to manually open and close two security gates to allow traffic to reach the Northfield Mountain Substation and the start of the 312 Access Road along the existing paved entrance (Exh. DPU-2-20). After construction, WMECO would restore the Temporary Access Road to pre-construction condition by

spreading seed and loam, although it could be re-used for future construction at the Northfield Mountain Substation (id.). For construction of the Loop Line, NEP would use its own access road along the A-127/B-128 corridor ("NEP Access Road"), which it recently improved for another project (Tr. at 75-76).

WMECO intends to install two staging and laydown areas in the WMECO-owned field adjacent to the Temporary Access Road, and to secure these two areas with temporary fencing (Exh. DPU-2-1). For a worker show-up location, WMECO is considering a two-acre site across Route 63 from the staging and laydown areas, although it has not made a final determination about the suitability of the site (Exh. DPU-2-1; Tr. at 55). NEP stated that it would not determine where its staging and laydown area would be until it selects its contractor (Tr. at 76).

WMECO stated that it prefers a paved road for permanent access to its substations in order to facilitate maintenance and access in any conditions (Tr. at 72). Therefore, for permanent access to the Erving Switching Station, WMECO stated that it intends to pave a new road that would originate near the end of Poplar Mountain Road and connect with the 312 Access Road ("Poplar Mountain Access Road") (Exh. DPU-1-61).[28] The Poplar Mountain Access Road would be secured with a gate (Tr. at 70-71). WMECO would also pave the 312 Access Road from where it intersects with the new Poplar Mountain Access Road to the Erving Switching Station (Exh. DPU-1-61). WMECO argued that constructing the

[28] WMECO stated that the Poplar Mountain Access Road would not be used for future construction projects, such as the natural gas pipeline proposed by TGP (Tr. at 75).

Poplar Mountain Access Road and paving part of the 312 Access Road would be shorter and less expensive than paving the entire 312 Access Road to provide paved access to the Erving Switching Station (Tr. at 73). WMECO stated that it has notified the Erving Town Administrator of its intentions to construct the Poplar Mountain Access Road and has also mailed a letter to abutting residences (Exh. DPU-2-21).[29]

The Company would use the Poplar Mountain Access Road for vehicles such as fuel delivery trucks for the back-up generator and panel trucks or bucket trucks for substation electricians (Tr. at 74-75). WMECO would construct a parking area adjacent to the Erving Switching Station for maintenance and service vehicle parking (Exh. DPU-2-29).

e. Air Impacts

The Companies stated that they would adhere to Massachusetts anti-idling law and regulations (G.L. c. 90, § 16A; G.L. c. 111, §§ 142A – 142M; 310 C.M.R. 7.11) and limit vehicle idling to five minutes with certain exceptions, such as for safety or vehicle repair (Exh. DPU-1-85). The Companies committed to use USEPA-verified (or equivalent) emission control devices, such as oxidation catalysts or other comparable technologies, in all diesel-powered non-road construction equipment rated 50 horsepower or above to be used for 30 or more days over the course of the Project (Exh. DPU-1-86). The Companies also committed to minimize the amount of dust generated by construction by installing crushed

[29] One abutter responded to the letter stating that he would not oppose the proposal as long as WMECO does not provide any new parking spaces at the start of the Poplar Mountain Access Road (Exh. DPU-2-21(S)).

stone pads at the Project's entry and exit points and to use water to wet down disturbed soils as needed (Exh. WMECO-1, at 78).

As part of the Project, WMECO would install six circuit breakers containing sulfur hexafluoride ("SF_6") and one SF_6-containing circuit switcher at the Northfield Mountain Substation, and three SF_6-containing circuit breakers at the Erving Switching Station (Exh. DPU-1-83(R1)).[30,31] The new equipment at the Northfield Mountain Substation would contain 3,568 pounds of SF_6, and the new equipment at the Erving Switching Station would contain 384 pounds of SF_6, for a Project total of 3,952 pounds (id.). The existing equipment at the Northfield Mountain Substation contains 3,435 pounds of SF_6 (id.).[32] WMECO stated that SF_6 gas is the current industry standard for use as an insulating and interrupting medium for transmission-class circuit breakers, and there were no alternatives available that would meet the Project needs in a cost-effective manner (id.). WMECO stated that it would procure SF_6-containing equipment with a leakage rate of less than 0.5 percent per year for the Project,

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30 SF_6 is a greenhouse gas ("GHG") that is 23,900 times more potent than carbon dioxide ("CO_2"). One pound of SF_6 has the same global warming impact as eleven tons of CO_2. See the Massachusetts Clean Energy and Climate Plan for 2020, at 77.

31 The Massachusetts Clean Energy and Climate Plan for 2020, issued by the Secretary of Energy and Environmental Affairs on December 29, 2010, adopts a 2020 statewide greenhouse gas emissions limit 25 percent below 1990 emissions levels and sets forth an integrated portfolio of policies to reach the Commonwealth's clean energy and climate goals. Reduction of an amount of SF_6 equivalent to a reduction of 0.2 million metric tons of CO_2 is one of the policies set forth in the Plan. See G.L. c. 21N and the Massachusetts Clean Energy and Climate Plan for 2020.

32 WMECO and Connecticut Light and Power (another Northeast Utilities distribution company subsidiary) combined for a 2013 nameplate capacity of 200,750 pounds of SF_6, with an annual leakage rate in 2013 of 0.8 percent (Exh. DPU-1-84).

and the manufacturers would factory-test the equipment to guarantee its leakage rate (RR-DPU-4).[33] The Companies entered into an SF_6 Emissions Reductions Partnership memorandum of understanding with the USEPA, and both Companies use the USEPA's mandatory reporting rule to track their SF_6 emissions (Exh. DPU-1-84).

f. Noise Impacts

The Companies projected that at the nearest residence to the New Line, the highest hourly noise levels from Project construction would be 52 dBA during foundation drilling for the transmission structures (Exh. DPU-2-27).[34] At the nearest residence to station construction, the highest projected noise levels would be 48 dBA during excavation activities that could include the use of a rock hammer (id.). At the nearest residence to the construction of the proposed Poplar Mountain Access Road, the highest projected noise levels would be 64 dBA during excavation activities that could include the use of a rock hammer (id.).

At Northfield Mountain Substation, the Company committed to use a reduced-sound transformer (Exh. WMECO-1, at 80). WMECO modeled the projected sound levels at the property line of the nearest residence, and the model predicted up to a four dBA increase at the nearest residential property line, depending on background noise levels (Exh. WMECO-1,

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[33] In April 2014, MassDEP promulgated final regulations that require companies to purchase new gas-insulated switchgear with a manufacturer's guaranteed annual SF_6 emission rate of one percent or less. The new regulations also include requirements for maintenance and handling of SF_6, and require that the Companies comply with a declining SF_6 emission rate standard by 2020. 310 C.M.R. § 7.72.

[34] Project construction noise levels would actually fluctuate, but would have the same average acoustic energy as a constant noise of 52 dBA (Exh. WMECO-1, at 80).

at 84). These noise increases would be below the MassDEP's ten dBA noise increase standard, as well as what WMECO identified as its own substation standard of limiting noise increases to no more than seven dBA, where practicable (Exh. WMECO-1, at 82). WMECO's noise model also indicated that there would be no pure tone violations of the MassDEP noise policy (id. at 84).[35]

The Companies stated that they did not anticipate any significant noise impacts from the operation or maintenance of the proposed Erving Switching Station, because potential noise sources would be limited to the standby generator and circuit breakers (Exh. DPU-1-93). The Companies stated that the standby generator would be housed within a noise dampening enclosure and would be tested on a monthly basis for no more than 30 minutes and generate sound similar to that of a large lawn mower (id.). Circuit breakers could generate sound levels up to 69 dBA at the nearest property boundary, but they would operate for less than one second per use and the Companies stated that they would be used very infrequently for emergencies, testing, and to isolate a line for maintenance (Exh. DPU-1-94).

g. Hazardous Waste

The Companies stated that due to the relatively undisturbed and remote nature of the Project area, they would not expect to encounter oil and hazardous materials along the Project route (Exh. WMECO-1, at 79). The Companies stated that there is the potential for equipment refueling to be performed at the Project site (Exh. DPU-1-67). Both Companies would have

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[35] MassDEP states that a pure tone condition exists where any one octave band sound pressure level exceeds the two adjacent frequency bands by three dBA or more (Exh. WMECO-1, at 81).

spill prevention and response protocols with procedures to minimize the potential for a fuel spill during construction and to control and minimize the potential impacts if a fuel spill were to occur (Exhs. WMECO-1, at 70; DPU-1-67).

New equipment installed as part of the Project would contain substances with the potential for negative environmental impact if leaked or spilled, including SF_6 gas in the circuit breakers (discussed above in Section II.C.3.e) and mineral oil dielectric fluid ("MODF") in the transformer, capacitors, and station service transformers (Exh. DPU-1-68). WMECO stated that in the event of a release of MODF, the fluid would be contained by secondary containment around the transformer, and WMECO would clean up and properly dispose of any released MODF (id.).

h. Safety

The Companies would post cautionary signs around all construction work sites (Exh. DPU-1-63). Specifically, construction work along the New Line would be signed and protected in accordance the Trail Use and Closure Plan developed with FirstLight (id.). Workers and contractors would adhere to all federal, state, and local safety and health requirements, as well as the Companies' own safety rules (Exh. DPU-1-64). During operations, the Northfield Mountain Substation and Erving Switching Station would be securely fenced with locking gates and would be signed to deter unauthorized entry (Exh. DPU-1-63).

i. Magnetic Fields

The Companies noted that magnetic fields are produced by any equipment that generates, transmits, or uses electricity (Exh. WMECO-1, at 84). The Companies modeled the projected magnetic field levels based on the existing system configuration and the proposed system configuration with the addition of the Project (id. at 89). WMECO analyzed projected magnetic field levels at average load and peak load conditions since magnetic field levels can vary based on the currents flowing through a conductor (id. at 85, 88-89).[36] WMECO's property extends beyond the boundaries of the corridor that would be cleared for this Project and the pre-existing, cleared 312 and 354 Line corridors (id. at 93). WMECO modeled the magnetic field levels at the edges of the narrowest portion of WMECO's property along the route of the New Line (id.).[37] The results of WMECO's modeling at average loads are shown below in Table 2.

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[36] The average load condition was modeled with a New England system load of 60 percent of ISO-NE's forecasted 90/10 peak load (Exh. WMECO-1, at 89).

[37] At the narrowest point along the proposed route of the New Line, WMECO's property is approximately 1,025 feet wide (Exh. WMECO-1, at 93).

Table 2. Modeled Magnetic Field Levels for Average New England Load

Configuration	Magnetic Field Levels (mG)				
	Western Edge of WMECO Property (~425 feet west of New Line)	Western Edge of Clearing (~340 feet west of New Line)	Maximum on WMECO Property (~75 feet west of New Line)	Eastern Edge of New Clearing (~50 feet east of New Line)	Eastern Edge of WMECO Property (~600 feet east of New Line)
Existing	6.9	21.2	331.2	32.3	1.2
Proposed	7.1	50.8	270.2	25.0	0.5
Change	+0.2	+29.6	-61.0	-7.3	-0.7

Source: Exh. WMECO-1, at 97-98.

The Company argued that the magnetic field level changes resulting from the Project are relatively small at the edge of WMECO's property (Exh. WMECO-1, at 98).

j. Analysis

The Companies propose to use a six-day per week construction schedule, from 7:00 a.m. to 7:00 p.m. Monday through Saturday, with the option to work outside of those hours and on Sunday in response to severe weather events, to minimize outages, and for indoor work with 24-hour notice to the affected town(s). The Companies stated that if they needed to work outside of normal work hours for any other reason they would coordinate with the impacted town(s). Project construction of the New Line would be 925 feet from the nearest residence, while the work at the Northfield Mountain Substation and the Erving Switching Station would be over 1,500 feet from any residence. Based on the distance between the work site and the nearest abutters, the Department approves the Companies' proposed work schedule. Should the Company need to extend construction work beyond those hours and days, the Company is directed to seek written permission from the relevant town authorities prior to the commencement of such work and to provide the Department with a copy of such

permission. If the Companies and town officials are not able to agree on whether such extended construction hours should occur, the Companies may request prior authorization from the Department and provide the towns with a copy of such request.

The land use impacts of the Project would generally be compatible with the adjacent existing transmission line corridors and recreation areas. The Companies developed a Trail Use and Closure Plan to limit the impacts of the Project on the recreational uses of NMREC. The visual impacts of the Project would not represent a significant detriment to the visual impacts of the existing transmission facilities in the Project area. Part of the New Line and the Erving Switching Station would be visible from some nearby vantage points, but they would be adjacent to existing transmission lines. Since only the general form of the switching station would be visible from a distance, and it would be adjacent to existing transmission lines, no additional visual mitigation is necessary. The Project facilities would normally be unlit.

The Project would not have any permanent impacts on streams or wetlands, and the Companies committed to take appropriate measures to protect intermittent streams and wetlands during construction, including suitable erosion and sedimentation control measures.

The Project would not cross any public roadways. The Companies would work with state and local authorities to ensure the safe delivery of any oversized loads to the Project site. WMECO stated that is has notified town officials and mailed a letter to abutting residences about its intentions to construct the Poplar Mountain Access Road. The Department directs WMECO to mail a follow-up letter to all residences and businesses on Poplar Mountain Road

prior to Project construction describing the construction of the Poplar Mountain Access Road and including a map of WMECO's road access proposal and Project contact information.

With respect to air quality impacts, the Company has stated its intention to use a number of measures to reduce both dust and motor vehicle emissions. In this regard, the Department directs the Companies to ensure that all diesel-powered non-road construction equipment with engine horsepower ratings of 50 and above to be used for 30 or more days over the course of Project construction must have USEPA-verified (or equivalent) emission control devices, such as oxidation catalysts or other comparable technologies (to the extent that they are commercially available) installed on the exhaust system side of the diesel combustion engine. Additionally, the Department directs that all vehicle idling must be limited, generally to five minutes, in accordance with the Massachusetts anti-idling law and regulations.

WMECO is subject to USEPA reporting and MassDEP statewide limits for SF_6 emissions. WMECO has proposed installing circuit breakers at the Northfield Mountain Substation and the Erving Switching Station with a design annual SF_6 leakage rate of less than 0.5 percent. In addition, the Department directs WMECO to inform the Department if it adds SF_6 to any of the new equipment at the Northfield Mountain Substation or the Erving Switching Station or replaces any equipment at either station due to SF_6 loss within five years of the completion and initial operation of the Project, after which time the Company will consult with the Department to determine whether the Department will require continuing reporting, as deemed appropriate.

With regard to noise, the Project would have limited construction impacts due to the distance between the Project and the nearest residences. Additionally, WMECO has committed to use a low-noise transformer, and therefore, the increase in operational noise at the Northfield Mountain Substation is not expected to exceed four dBA at the nearest residential property line.

Both Companies will have spill prevention and response protocols to deal with the potential of fuel spills from on-site refueling during construction. WMECO would have secondary containment around its new transformer to prevent the release of MODF during operations. The Companies committed to follow all federal, state, and local safety and health requirements.

With the construction of the New Line, magnetic field levels at the edge of WMECO's property and the cleared ROWs would increase to the west of the New Line and decrease to the East of the New Line. The maximum magnetic field levels on WMECO's property would decrease.

The Department concludes that based on the Project's compliance with: (1) all applicable federal, state, and local laws and regulations; (2) the avoidance, minimization, and mitigation measures that the Companies have stated that they will implement during Project construction and operation; and (3) the Department's conditions as discussed above and set forth below, the impacts of the Project will be minimized.

4. Conclusion on Public Convenience and Welfare

Based on the foregoing analysis of: (1) need for or public benefit of use;

(2) alternatives explored; and (3) impacts of the proposed use, the Department finds that the benefits of the Project exceed adverse local impacts. Further, the Department finds that the proposed use is reasonably necessary for the public convenience or welfare.

D. Exemptions Required

1. Introduction

WMECO is seeking seven individual exemptions from specific sections of the Northfield Zoning Bylaw and nine individual exemptions from specific sections of the Erving Zoning Bylaw (collectively, the "Zoning Bylaws") (Exh. WMECO-2, at 8-15).[38] In addition, WMECO is also seeking comprehensive exemptions from Zoning Bylaws of both towns (id. at 18-21). WMECO asserts that Project cannot be constructed without zoning relief, and that seeking such relief through traditional channels would result in, at the very least, a delay that would negatively affect system reliability (id. at 8). Consequently, WMECO asserts that both specific and comprehensive relief are required (id. at 8).

2. Individual Exemptions

a. WMECO's Position

In addition to the general reasons cited above, Table 3, below, summarizes the provisions of the Zoning Bylaws from which WMECO seeks exemptions, the relief available from each Town, and WMECO's argument as to why the Project cannot comply with the identified zoning provisions.

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[38] WMECO alone filed the zoning exemption petition: D.P.U. 13-187 (Exh. DPU-1-103). NEP is not a party to the zoning exemption petition because the Companies do not believe that zoning relief is required for any of the construction to be undertaken by NEP (id.).

Table 3: WMECO's Position – Northfield Zoning Bylaw Exemptions

Individual Zoning Exemption Requested	Relief Available from Town	Why the Project Cannot Comply: Company's Position
Use Regulations Schedule Section 6.02	Special Permit	The Project would be considered a "Public Utility Facility" and would therefore require a special permit[39] in order to be constructed (Exh. WMECO-2, at 8). The subjective nature of a grant of a special permit creates legal uncertainty, the potential for appeals, and accompanying delay, burden, and undue expense (id.).
Dimensional Regulations and Setback Requirements Section 7.01	Variances	Various structures within the Northfield Mountain Substation ("Substation") would exceed the maximum allowable height for structures in the zoning district pursuant to the Northfield Zoning Bylaw (Exh. WMECO-2, at 8-9). The standard for obtaining a height variance would be difficult or impossible for WMECO to meet (id. at 9; DPU-1-114). Furthermore, variances are a legally disfavored form of relief and, even if granted, can be appealed (Exh. WMECO-2, at 9).
Access Regulations Section 7.03	Special Permit	Access to the Substation is presently via a driveway over other property (Exh. WMECO-2, at 9). The expansion of the Substation may be seen as overburdening the existing access, requiring a special permit (id.). The subjective nature of a grant of a special permit creates legal uncertainty, the potential for appeals, and accompanying delay, burden, and undue expense (id. at 8, 9).
Site Plan Review Section 10.1	Special Permit	As mentioned above, construction of the Project would require a special permit (Exh. WMECO-2, at 8). Site Plan review may be required by the Northfield Zoning Board of Appeals for any industrial use that requires a special permit (id. at 9). The subjective nature of a grant of a special permit creates legal uncertainty, the potential for appeals, and accompanying delay, burden, and undue expense (id. at 8, 9).
Earth Removal Section 11.01	Special Permit	The expansion of the Substation would require the removal of earth, rocks, and other material to the extent that a special permit would be required (Exh. WMECO-2, at 10). Neither WMECO nor NEP has ever obtained a special permit for earth removal in connection with construction of the existing facilities (Exh. DPU-1-107). Consequently, there is no precedent for obtaining such a special permit. As mentioned, the subjective nature of a grant of a special permit creates legal uncertainty, the potential for appeals, and

[39] No special permit was obtained before constructing the Northfield Mountain Substation (Exh. DPU-1-106). Consequently, there is no special permit in existence that could be modified to apply to the proposed expansion (id.).

Individual Zoning Exemption Requested	**Relief Available from Town**	**Why the Project Cannot Comply: Company's Position**
		accompanying delay, burden, and undue expense (Exh. WMECO-2, at 10).
Erosion Control Section 11.04	Variance	This section requires that no construction may cause a change in the natural surface drainage onto abutting property (Exh. WMECO-2, at 10). This restriction could be interpreted to restrict construction of the Project; if so, a variance would be required (id.). Variances are difficult to obtain, are a disfavored form of relief, and are subject to appeal (id. at 9, 10). These problems create a significant potential for adverse interpretations and for undue delay, burden, and expense (id.).
Sign Regulations Section 11.05	Variance	WMECO intends to erect informational and warning signs as required or recommended by the applicable section of the National Electric Safety Code and its own internal policy (Exh. WMECO-2, at 11). Such signs, however, may not be allowed; thus, WMECO may be required to obtain a variance from this Bylaw section (id.). The effort to obtain such a variance may result in an adverse outcome because variances are difficult to obtain, are a disfavored form of relief, and are subject to appeal (id. at 9, 10, 11).

Table 4: WMECO's Position – Erving Zoning Bylaw Exemptions

Individual Zoning Exemption Requested	Relief Available from Town	Why the Project Cannot Comply: Company's Position
Erosion Control Section 2.2.1	Special Permit	Application of this provision to the Project could result in delay to the permitting process because it would require WMECO to perform a topographic survey (Exh. WMECO-2, at 11, 12). Furthermore, in the event that the topographic survey indicates that any portion of the proposed workplace contains a slope of 25 percent or greater, WMECO would need to obtain a special permit from the Erving Planning Board (id. at 12). This issue would cause confusion because the Bylaw says nothing about how the 25 percent grade should be measured, i.e., how much area must be used for measurement (Tr. at 89-90). As noted above, the grant of a special permit is discretionary and the standards and criteria for granting it are subjective. This creates uncertainty and could result in lengthy and costly appeals.
Disturbances Section 2.2.5	Variance	Circuit breaker operation at the Erving Switching Station may, on occasion, generate noise that could meet or exceed the limits imposed by this section (Exh. WMECO-2, at 12; Exh. DPU-1-94; Exh. DPU-1-111). If such limits were exceeded, then WMECO would need to obtain a variance (Exh. WMECO-2, at 12). The standard for obtaining such a variance would be difficult or impossible for WMECO to meet (id.). Furthermore, variances are a legally disfavored form of relief and, even if granted, can be appealed (id.).
Removal of Natural Material Section 5.2.3	Special Permit	With certain exceptions not here relevant, this section provides that removal of "sod, earth, mineral aggregates, stone or rock from a parcel of land" requires a special permit (Exh. WMECO-2, at 13). The construction of the Erving Switching Station would require substantial grading and earth removal and may involve activities that would meet the threshold requirements of this section (id. at 13). Therefore, WMECO would need to obtain a special permit before beginning construction. As noted above, the grant of a special permit is discretionary and the standards and criteria for granting it are subjective. This creates uncertainty and could result in lengthy and costly appeals.

Individual Zoning Exemption Requested	**Relief Available from Town**	**Why the Project Cannot Comply: Company's Position**
Hillside Area Section 2.2.7	Variance	For structures constructed on a hillside, a certain percentage of the slope must remain covered with vegetation. The construction of the Erving Switching Station would require substantial clearing, grading, and earth removal in an area of approximately 3.5 acres, and these activities could result in an area of hillside that lacks the requisite amount of vegetation (Exh. WMECO-2, at 13). If this were to happen, then WMECO would need to obtain a variance. As noted above, variances are difficult to obtain, are a disfavored form of relief, and are subject to appeal (id.).
Use Regulations Schedule Section 4.2	Special Permit	The proposed Erving switching station is likely to be considered a "Public Utility Facility" and the Bylaw provides that a "Public Utility Facility" requires a special permit to be constructed in any zoning district (Exh. WMECO-2, at 13). Therefore, WMECO would need to obtain a special permit to construct the Project. As noted previously, the grant of a special permit is discretionary and the standards and criteria for granting it are subjective. This creates uncertainty and could result in lengthy and costly appeals.
Parking and Loading Section 4.5	Special Permit	WMECO proposed to construct a parking lot adjacent to the new Erving Switching Station for maintenance and service vehicles (Exh. DPU-2-29). The Bylaw requires the construction of off-road parking "to service all increases in parking demand created by new structures" (Exh. WMECO-2, at 14). The Company stated that it may be unable to comply with all the requirements of the requirement (Tr. at 88). WMECO seeks an exemption from this Zoning Bylaw to avoid the potential for adverse interpretations, delay, burden, and undue expense that are associated with the permitting process and appeals therefrom (Exh. WMECO-2, at 14).
Sign Regulation Section 4.6	Variance	WMECO intends to erect any and all informational and warning signs as required or recommended by the applicable section of the National Electric Safety Code and its own internal policy; such signs, however, may not be allowed by the Bylaw (Exh. WMECO-2, at 14-15). Thus, WMECO may be required to obtain a variance from this Bylaw section (id. at 15). The effort to obtain such a variance may result in an adverse outcome because variances are difficult to obtain, are a disfavored form of relief, and are subject to appeal (id.).
Dimensional Regulation and Structure Height	Variance	The structures to be constructed as part of the Project would not conform to the dimensional schedule (Exh. WMECO-2, at 15, and Exhibit B at 40). Consequently, WMECO would be required to obtain a variance (Exh. WMECO-2, at 15). This may result in an

Individual Zoning Exemption Requested	Relief Available from Town	Why the Project Cannot Comply: Company's Position
Section 5.2		adverse outcome because variances are difficult to obtain and are considered a disfavored form of relief.
Site Plan Review Section 6.2	Site Plan Approval	The Town of Erving could interpret its Zoning Bylaw to require WMECO to install ten or more parking spaces in connection with construction of the Project (Exh. WMECO-2, at 15). If so, then the Project would be subject to a site plan review and would need to obtain site plan approval from the Erving Planning Board (id. at 15, Exhibit B at 44). A site plan review is a discretionary process and it could impose burdensome, uncertain, or restrictive conditions that could substantially delay or even prevent the construction of the Project (Exh. WMECO-2, at 15). Accordingly, WMECO is seeking an exemption from the requirement of obtaining site plan approval for the Project.

b. Analysis and Finding

Construction of the Project would require WMECO to obtain variances providing relief from several provisions of the Zoning Bylaws. Regarding the Northfield Zoning Bylaw, the Project would not meet, and thus would likely require a variance from: the dimensional regulations and setback requirements (Section 7.01); erosion control restrictions (Section 11.04); and the sign regulations (Section 11.05). For the Erving Zoning Bylaw, the Project would not meet, and thus would likely require a variance from: noise disturbance limits (Section 2.2.5); the requirement that the slope on which structures are built must retain a certain percentage of vegetative cover (Section 2.2.7); signage regulation (Section 4.6); and the dimensional schedule for structures (Section 5.2).

WMECO would also need to obtain several special permits in order to construct the Project. For the Northfield Zoning Bylaw, construction of the Project itself would require a special permit (Section 6.02). Special permits likely would also be required for continued use

of the existing driveway to access the Substation (Section 7.03); exemption from site plan review by the Northfield Zoning Board of Appeals (Section 10.1); and earth removal (Section 11.01). Regarding the Erving Zoning Bylaw, construction of the Project would likely require WMECO to obtain special permits providing relief from the provisions of erosion control (Section 2.2.1); removal of "sod, earth, mineral aggregates, stone or rock" (Section 5.2.3); construction of a "Public Utility Facility" in any zoning district (Section 4.2); and construction of new off-street parking spaces (Section 4.5). Finally, construction of the Project would likely also require WMECO to obtain an exemption from site plan approval by the Erving Zoning Board (Section 6.2).

The Department concurs with WMECO that variances are difficult to obtain, constitute a disfavored form of relief, and are susceptible to overturn on appeal.[40] The Company has requested a variance from Section 2.2.5 of the Erving Zoning Bylaw, arguing that circuit breaker operation at the Erving Switching Station may, on occasion, generate noise that could meet or exceed the limits imposed by this section. Were the Department to grant an exemption from the entirety of Section 2.25, however, the Town of Erving could not exercise local control over the ongoing operation of the proposed facility with respect to noise, vibration,

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[40] That variances are a legally disfavored form of relief is well-established in case law. The Supreme Judicial Court addressed this issue in a fairly recent opinion, Mendoza v. Licensing Board of Fall River, 444 Mass. 188, 207-208 (2005) ("Variances allowing nonconforming uses should be unusual because they are individual waivers of local legislation. It is only in rare instances and under exceptional circumstances that relaxation of the general restrictions ought to be permitted") (internal citations omitted). See also, Guiragossian v. Board of Appeals of Watertown, 21 Mass.App.Ct. 111, 115 (1986) ("No person has a legal right to a variance and they are to be granted sparingly" citing Damaskos v. Board of Appeal of Boston, 359 Mass. 55 (1971)).

odors, and flashing covered by Section 2.25. NSTAR Electric Company, D.P.U. 13-126/127, at 34-35 (2014) ("Electric Avenue"); NSTAR Electric Company, D.P.U. 13-64, at 32 (2014) ("Barnstable"); Braintree Electric Light Department, EFSB 07-1/D.P.U. 07-5, at 101-102 (2008). Although the Department grants the requests for zoning exemptions to facilitate construction and avoid unnecessary delay or adverse zoning outcomes, the Department believes that once such facilities are operational they should comply with local environmental performance requirements, such as those included in Section 2.25. Consequently, the Department finds that WMECO requires exemptions from: Northfield Zoning Bylaw sections 7.01, 11.04, and 11.05; and Erving Zoning Bylaw sections 2.2.7, 4.6, and 5.2, as well as the noise requirements in Erving Zoning Bylaw section 2.2.5 as they relate to circuit breaker operations only.

The need to obtain Special Permits creates its own risks (Exh. WMECO-2, at 8-15). Specifically, the discretionary standards for approving a Special Permit may result in the imposition of burdensome, restrictive, or unreasonable conditions (id.). See Westborough at 32. Consequently, even if the Project were to receive all of the Special Permits that it might require, the conditions imposed by those permits might impeded or thwart the development of the Project (Exh. WMECO-2, at 8-15). Westborough at 32. Consequently, the Department also finds that WMECO requires exemptions from Northfield Zoning Bylaw sections 6.02, 7.03, 10.1, and 11.01, and from Erving Zoning Bylaw sections 2.2.1, 5.2.3, 4.2, and 4.5.

Finally, as noted above, the Town of Erving could interpret its Zoning Bylaw in such a manner that construction of the Project would require site plan approval from the Erving

Planning Board pursuant to section 6.2 of the Erving Zoning Bylaw (Exh. WMECO-2, at 15). A site plan review is a discretionary process and it could impose burdensome, uncertain, or restrictive conditions that could substantially delay or even prevent the construction of the Project (id.). Consequently, the Department finds that WMECO also requires an exemption from Erving Zoning Bylaw section 6.2.

3. Consultation with Municipalities

a. Introduction

WMECO met with officials from the towns of Northfield and Erving on a number of occasions in the summer and fall of 2013 (Exhs. WMECO-2, at 16, 17; DPU-1-7). On August 27, 2013, at the Erving Town Hall, WMECO met with the Erving Town Administrator and its Public Works director (Exh. WMECO-2, at 16). At that meeting, WMECO described the Project and the Department process to the Erving officials, and it also described the need for local support for the zoning exemptions (Exh. WMECO-2, at 16). On October 17, 2013, WMECO covered the same issues in another meeting at Erving Town Hall, this time with the Erving Planning Board Chairman and a Planning Board member (id.). Finally, on December 16, 2013, at a regular meeting of the Erving Board of Selectmen that was also attended by the Planning Board Chairman, WMECO further explained the Project and they reviewed the zoning exemption process (id. at 17).

On October 1, 2013, WMECO met with the Northfield Interim Town Administrator and the Chair of the Zoning Board of Appeals during which the Company described the Project, the Department process, and the need for local support for the zoning exemption

(Exh. WMECO-2, at 16). On December 5, 2013, the Northfield Board of Selectmen held a joint meeting with the Board of Appeals and the Planning Board at which WMECO was present and discussed zoning exemptions with the town officials (id. at 17).

The Northfield Board of Selectmen sent a letter to WMECO dated January 7, 2014, in which the Selectmen support the Company's requests for zoning exemptions (Exh. WMECO-2, at 18, and at Exhibit G).[41] On January 27, 2014, the Erving Board of Selectmen voted to support WMECO's request for individual and comprehensive exemptions from its zoning bylaws (id. at 18). The Erving Board of Selectmen sent a letter to this effect to the Company, dated February 3, 2014 (id. at Exhibit H).

b. Analysis and Findings

The Department continues to favor the resolution of local issues on a local level whenever possible to reduce concern regarding any intrusion on home rule. Russell Biomass LLC/Western Massachusetts Electric Company, EFSB 07-4/D.P.U. 07-35/07-36, at 60-65 (2009) ("Russell"). The Department believes that the most effective approach for doing so is for applicants to consult with local officials regarding their projects before seeking zoning

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[41] In Northfield's letter of support, the Northfield Zoning Board of Appeals and Planning Board set forth the following stipulations: (1) that they receive a copy of the final construction plan and time table; (2) that Town representatives retain the right to conduct site visits; and (3) that an open line of communication be established regarding any land modification (pertaining to earth removal or erosion control) and traffic (Exh. WMECO-2 at Exhibit G). The Northfield Zoning Board of Appeals also requested that Town of Northfield receive all correspondence and notifications related to EPA inspections and their results, and recommended that the Town of Northfield intervene in the Department's proceeding (Exh. WMECO-2 at Exhibit G). Contrary to this advice, however, the Town of Northfield did not move to intervene in this proceeding.

exemptions pursuant to G.L. c. 40A, § 3 and Section 6 of Chapter 665 of the Acts of 1956. Electric Avenue at 29; Barnstable at 24-25; Westborough at 33-34.

In this case, prior to seeking zoning relief from the Department, WMECO had multiple contacts with various authorities from the towns of Northfield and Erving regarding the Project. As described above, the record shows that the towns of Northfield and Erving support both individual and comprehensive exemptions from the Zoning Bylaws, subject to certain provisions requested by the Town of Northfield. To enhance communication and coordination with the towns, the Department requires that: (1) WMECO send the towns of Northfield and Erving a copy of the final construction plans and schedule, including expected work hours and traffic impact; (2) representatives of the Towns of Northfield and Erving have the right to conduct site visits with appropriate notice to the Company; and (3) WMECO designate a representative to serve as a liaison to address any questions raised by the towns of Northfield or Erving. With these provisions, we find that WMECO has made a good faith effort to consult with municipal authorities and that WMECO's communications were consistent with the spirit and intent of Russell.

4. Conclusion on Requests for Individual Zoning Exemptions

As described above, the Department finds that: (1) WMECO is a public service corporation; (2) the proposed use is reasonably necessary for the public convenience or welfare; and (3) the specifically identified zoning exemptions are required for purposes of G.L. c. 40A, § 3. Accordingly, we grant WMECO's request for the individual zoning exemptions listed above in Tables 3 and 4, with the exception of the operational limits

specified in Section 2.2.5 of the Erving Zoning Bylaw as they relate to any disturbance other than circuit breaker operation.

III. REQUEST FOR COMPREHENSIVE EXEMPTIONS

A. Standard of Review

The Department has granted requests for a comprehensive zoning exemption on a case-by-case basis. NSTAR Electric Company, D.P.U. 07-60/07-61, at 50-51 (2008), citing Princeton Municipal Light Department, D.T.E./D.P.U. 06-11, at 37 (2007) ("Princeton"); NSTAR Electric Company, D.T.E./D.P.U. 07-9/07-10, at 37 (2007). The Department will not consider the number of exemptions required as a sole basis for granting a comprehensive exemption. Princeton at 37. Rather, the Department will consider a request for comprehensive zoning relief only when issuance of a comprehensive exemption would avoid substantial public harm. Id.; see also NSTAR Electric Company, D.P.U. 07-60/07-61, at 51-52 (2008).

B. The Company's Position

WMECO sets forth a number of arguments in favor of the Department granting a comprehensive exemption from the zoning bylaws of both Northfield and Erving (Joint Brief at 62-65).

First, WMECO states that the following factors are relevant to the decision on granting requests for comprehensive exemptions: (1) whether the project is needed for reliability; (2) whether the project is time-sensitive; (3) whether there are multiple municipalities involved that could have conflicting zoning provisions that might hinder the uniform development of a

project spanning these communities; (4) whether the proponent has actively engaged the local officials in the communities in which the project will be located to discuss the applicability of local zoning provisions and to address local concerns; and (5) whether the communities affected by the project assent to the issuance of comprehensive exemptions (Joint Brief at 62-63, citing New England Power Company d/b/a National Grid and Western Massachusetts Electric Company, 18 DOMSB 323, EFSB 10-1/D.P.U. 10-107/10-108, at 89-90 (2012) ("Hampden County Reliability Project"); NSTAR Electric Company, EFSB 10-2/D.P.U. 10-131/D.P.U. 10-132 (2012) at 110-111 ("NSTAR Lower SEMA"); Western Massachusetts Electric Company, 18 DOMSB 7, EFSB 08-2/D.P.U. 08-105/08-106, at 136-137 (2010) ("GSRP Decision")).

Second, WMECO argues that energy infrastructure facilities such as the Project are both: (1) very different from the kind of structures usually regulated by zoning ordinances; and (2) heavily regulated by comprehensive state and industry standards promulgated to ensure safety (Joint Brief at 63). Consequently, without a comprehensive zoning exemption, town officials may easily interpret various zoning provisions in a manner that conflicts with state and industry engineering standards (id.).

Third, WMECO argues that a comprehensive exemption is necessary to protect against changes to a zoning bylaw that may be adopted in the future (Joint Brief at 64, citing Exh. DPU-2-32). Specifically, without the grant of a comprehensive exemption, the mere publication of a notice of proposed change to a zoning bylaw before the issuance of a building permit for any structure included in the Project could result in the new zoning provision being

applicable to that structure (Joint Brief at 64, citing G.L. c. 40A, § 6, paragraph 1). Furthermore, even the issuance of a building permit would not necessarily protect the structures that are part of the Project against changes to a zoning bylaw. If construction of a structure is delayed for six months or more after the issuance of a building permit, then the construction and operation of that structure would be subject to any subsequent amendment of the bylaw (Joint Brief at 64, citing Exh. DPU-2-32). A grant of individual zoning exemptions by itself cannot protect against changes to the Northfield or Erving Zoning Bylaws that may derail the Project (Joint Brief at 64).

Fourth, the design and precise locations of the Project are not final and they may change after the Department's action in this proceeding (Joint Brief at 64, citing Exh. DPU-2-32). For example, WMECO may decide to, or may be required to, install a shunt reactor at the Northfield Mountain Substation (Exh. WMECO-1, at 4, n. 3; Tr. at 37-40; Joint Brief at 65, n.34). Absent the granting of comprehensive zoning relief, the addition of such equipment could require WMECO to obtain further zoning relief, thereby causing additional costs and delay (Joint Brief at 65, n. 34). Furthermore, design changes may result from field conditions encountered during construction or as a result of concerns raised by town officials or residents (Joint Brief at 64-65).

C. Analysis and Findings

The grant of a comprehensive exemption is based on the specifics of each case. Compared to the grant of individual zoning exemptions, which is tailored to meet the construction requirements of a particular project, the grant of a comprehensive exemption

serves to nullify a municipality's zoning code in its entirety with respect to the project under review. Thus, compared to the grant of individual zoning exemptions, a comprehensive zoning exemption constitutes a broader incursion upon municipal home rule authority. In the absence of a showing that substantial public harm may be avoided by granting a comprehensive exemption, the granting of such extraordinary relief is not justified. Electric Avenue at 37; Westborough at 35-37; NSTAR Electric Company Waltham, D.P.U. 08-1, at 35-37 (2009).

Department and Siting Board cases that have considered and granted comprehensive exemptions have typically involved projects that were time sensitive and that dealt with the zoning ordinances of multiple municipalities, where conflicting interpretations could arise. NGrid Worcester, EFSB 09-1/D.P.U. 09-131/09-132 (2011); Western Massachusetts Electric Company, EFSB 08-2/D.P.U. 08-105/08-106 (2010); New England Power Company Millbury, D.P.U. 09-136/09-137 (2011).

The Project does span more than one municipality, and there is the possibility that Northfield and Erving could conflict in their interpretation of their zoning bylaws. Furthermore, WMECO has consulted extensively with both towns, and each town assents to the granting of a comprehensive exemption. Construction of the Project is also necessary for system reliability. As noted above, the Project's construction is time-sensitive, given that the PGA is currently out of compliance with national and regional reliability standards. Consequently, the Department concludes that the comprehensive exemptions from the Northfield and Erving Zoning Bylaws requested by WMECO may indeed avoid substantial public harm and otherwise merit the Department's approval, with the exception that the

exemption from Section 2.2.5 of the Erving Zoning Bylaw is limited to circuit breaker operations as discussed above.

IV. REQUEST FOR AUTHORITY TO CONSTRUCT AND USE TRANSMISSION LINE(S) PURSUANT TO G.L. C. 164, § 72

A. Standard of Review

General Laws 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.[42]

The Department, in making a determination under G.L. c. 164, § 72, considers all aspects of the public interest. Boston Edison Company v. Town of Sudbury, 356 Mass. 406, 419 (1969). Among other things, Section 72 permits the Department to prescribe reasonable conditions for the protection of the public safety. Id. at 419-420.

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; (2) the environmental impacts or any other impacts of the present or proposed use; and (3) the present or proposed use and any

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[42] 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.

alternatives identified. Westborough at 37-38; NSTAR Electric Company/New England Power Company d/b/a National Grid, D.P.U. 11-51, at 6 (2012); Boston Edison Company, D.T.E. 99-57, at 3-4 (1999). 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.

B. Analysis and Findings

In evaluating petitions filed pursuant to G.L. c. 164, § 72, the Department relies on the standard of review established for G.L. c. 40A, § 3, for determining whether the Project is reasonably necessary for the convenience or welfare of the public. Based on the record in this proceeding and the above analysis in Section II.C.3, compliance with the directives and mitigation discussed in Section II.C.3, above, and compliance with applicable state and local regulations, the Department finds pursuant to G.L. c. 164, § 72, that the proposed transmission line is necessary for the purpose alleged, will serve the public convenience, and is consistent with the public interest.

V. SECTION 61 FINDINGS

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 C.M.R. § 11.01(4), Section 61 findings are necessary when an environmental impact report ("EIR") is submitted to the Secretary of EEA, and should be based on such EIR. Where an EIR is not

required, Section 61 findings are not necessary. 301 C.M.R. § 11.01(4). On December 20, 2013, the Secretary issued a Certificate on the Company's Environmental Notice Form, determining that the Project does not require the preparation of an EIR (Exh. WMECO-1, Exhibit B). Accordingly, Section 61 findings are not necessary in this case.[43]

VI. ORDER

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

ORDERED: That the petition of WMECO seeking the specific exemptions set forth in Tables 3 and 4 from the operation of the zoning bylaws of the towns of Northfield and Erving pursuant to G.L. c. 40A, § 3, is granted with the exception of the operational limits specified in Section 2.2.5 of the Erving Zoning Bylaw as they relate to any disturbance other than circuit breaker operation; and it is

FURTHER ORDERED: That the petition of WMECO seeking comprehensive exemptions from the operation of the zoning bylaws of the towns of Northfield and Erving pursuant to G.L. c. 40A, § 3, is granted with the exception of the operational limits specified

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[43] The Department notes the requirements set forth in G.L. c. 30, § 61, effective November 5, 2008, regarding findings related to climate change impacts. Since Section 61 findings are not required in this case, the Project is not subject to EEA's Greenhouse Gas Emissions Policy and Protocol. The Department nonetheless notes that this Project would have low greenhouse gas emissions because it does not itself generate power and because the new substation equipment has reduced leakage rates, less than MassDEP standards. As such, the Project would have minimal direct emissions from a stationary source under normal operating conditions, and would have minimal indirect emissions from transportation sources limited to construction, occasional repair, or maintenance activities. The Department addresses Project SF_6 emissions in more detail in Section II.C.3.e, above.

in Section 2.2.5 of the Erving Zoning Bylaw as they relate to any disturbance other than circuit breaker operation; and it is

FURTHER ORDERED: That the petition jointly filed by WMECO and NEP seeking approval to construct and operate a transmission line pursuant to G.L. c. 164, § 72, is granted; and it is

FURTHER ORDERED: That in order to inform those who will be affected by the construction of a Temporary Access Road, the Department directs WMECO to mail a follow-up letter to all residences and businesses on Poplar Mountain Road prior to Project construction describing the construction of the Poplar Mountain Access Road and including a map of WMECO's road access proposal and Project contact information; and it is

FURTHER ORDERED: That in order to minimize air impacts the Department directs the Companies to ensure that all diesel-powered non-road construction equipment with engine horsepower ratings of 50 and above to be used for 30 or more days over the course of the Project construction must have USEPA-verified (or equivalent) emission control devices, such as oxidation catalysts or other comparable technologies (to the extent they are commercially available) installed on the exhaust system side of the diesel combustion engine; and that prior to the commencement of construction, the Companies shall submit to the Department certification of compliance with this condition; and it is

FURTHER ORDERED: That in order to keep better track of SF_6 emissions, WMECO is directed to inform the Department if it adds SF_6 to any of the new equipment at the Northfield Mountain Substation or the Erving Switching Station or replaces any equipment at

either station due to SF_6 loss within five years of the completion and initial operation of the Project, after which time the Company will consult with the Department to determine whether the Department will require continuing reporting, as deemed appropriate; and it is

FURTHER ORDERED: That WMECO and NEP and its contractors and subcontractors comply with all applicable federal, state, and local laws, regulations, and ordinances for which the Companies have not received an exemption; and it is

FURTHER ORDERED: That WMECO and NEP obtain all other government approvals necessary for the Project; and it is

FURTHER ORDERED: That WMECO and NEP and their successors in interest notify the Department of any significant changes in the planned timing, design, or environmental impacts of the Project so that the Department may decide whether to inquire further into a particular issue; and it is

FURTHER ORDERED: That because the issues addressed in this Order relative to this Project are subject to change over time, construction of the Project commence within three years of the date of this Order; and it is

FURTHER ORDERED: That within 90 days of Project completion, the Companies submit a report to the Department documenting compliance with all conditions contained in this Order, noting any outstanding conditions yet to be satisfied and the expected date and status of such resolution; and it is

FURTHER ORDERED: That the Secretary of the Department transmit a certified copy of this Order to the towns of Northfield and Erving, and that the Companies serve a copy

of this Order on the Northfield Board of Selectmen, the Northfield Planning Board, the Northfield Zoning Board of Appeals, the Erving Board of Selectmen, the Erving Planning Board, and the Erving Zoning Board of Appeals within five business days of its issuance and to certify to the Secretary of the Department within ten business days of its issuance that such service has been accomplished; and that said certification be served upon the Hearing Officer and all parties to this proceeding.

By Order of the Department:

/s/

Angela M. O'Connor, Chairman

/s/

Jolette A. Westbrook, Commissioner

/s/

Robert Hayden, 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.