



via email

May 23, 2022

Attorney J. Raymond Miyares
Miyares Harrington
40 Grove Street, Suite 190
Wellesley, MA 02482

Re: Petition of New England Power Company for a Grant of Location for Electric Transmission Line (N-192 Cable Replacement Project)

Dear Attorney Miyares:

In advance of the City Council's May 16th continued public hearing, New England Power Company ("Company" or "NEP") writes to respond to the questions in your May 16th letter and also to address additional comments from the public and Commissioner Collins.

- 1. During the discussion on April 5, a question was posed regarding National Grid's anticipated response in the event that measured post-construction EMF levels exceed the levels predicted by the modeling submitted to the Energy Facilities Siting Board in EFSB 19-04. The Company's response suggested that a response to measured exceedances would depend on a number of factors. Please provide a written clarification: What does the Company consider to be the most important factors in determining an appropriate response? How does the Company believe these factors should be weighted? Whose decision should govern the selection of a response?**

NEP Response

NEP has agreed to measure magnetic fields (MF) prior to and after the operation of the new Cable at representative locations determined in consultation with Commissioner Collins and to report those measurements to the City of Beverly. Because MF calculations have been demonstrated to be reliable and accurate, the Company is confident that the post-operation measurements will closely match the calculated levels. If a measurement exceeds pre-operation calculations, after accounting for as-built configuration and loading, the question of whether that exceedance would merit a response by the Company would depend on the following factors, which are addressed in order of priority:

- i. Identifying the cause – There are many other potential sources of MF in the built environment, and accordingly the Company would need to determine whether or not the MF from the Cable is the cause of the exceedance.

- ii. The magnitude of the exceedance – As the Council is aware, both from the City’s own expert and the Company’s testimony, public health experts have established an MF exposure guideline of 2,000 milligauss (mG) based on what scientific investigation has determined is protective of human health. The calculated MF levels for the Project are a small fraction of that public health guideline. One reason for the lower MF from the Project is that the Company has already mitigated MF by designing the Cable to optimize the MF-cancellation effect between the phase conductors of the Cable.

In addition, in response to an inquiry from a Beverly resident regarding a pacemaker, the EMF experts from Exponent researched the industry standards for active implantable medical devices for safety and electromagnetic compatibility and determined that the calculated magnetic fields from the Project are more than 10-times lower than the standard to which Medtronic (the manufacturer of the resident’s pacemaker) designs and tests its devices as stated in its manual for health care providers.

There is no evidence to suggest that MF from the Cable would cause any adverse health effect or medical device interference that would warrant mitigation.

- iii. The location of the exceedance(s) – The Company does not believe that it would be prudent to increase the cost of the Project to mitigate MF levels in locations where there is a small likelihood of sustained exposure.
- iv. The impact of the mitigation measure on operation and cost – Certain mitigation measures, like steel plating, are expensive and could cause de-rating of the Cable, thereby reducing the capacity of the Cable and, by extension, its anticipated benefit to the reliability of the system. The Company and the Energy Facilities Siting Board (“EFSB”) would have to closely weigh whether, on balance, it was prudent to create adverse operational impacts and increased costs to achieve a small additional reduction in MF levels that are already well below accepted public health guidelines.

Consistent with EFSB precedent encouraging reduction of magnetic fields, the Company has already designed the new Cable to be constructed underground and with a small phase-to-phase separation distance, which reduces magnetic field exposures. In its Final Decision approving the Company’s Project, the EFSB found that magnetic field impacts of the Project, as proposed, would be minimized and required no further mitigation. See New England Power Company d/b/a National Grid, EFSB 19-04/D.P.U. 19-77/19-78 at 103 (2021) (“Final Decision”).

2. **In the EFSB proceeding, National Grid represented that the transmission line would be buried at a depth ranging from 2.5 feet to 10 feet, except where the duct bank will cross over utilities or bedrock. In that case, the depth may be less than 2.5 feet, and a steel plate will be installed over the duct bank. The EFSB’s Final Decision (at page 101) states that, for National Grid’s EMF modeling, “NEP assumed a burial**

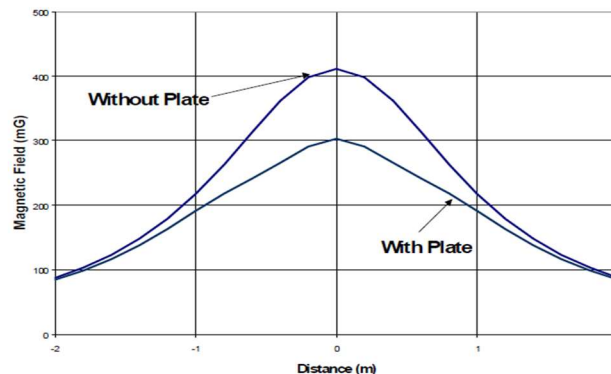
depth of 2.5 feet for the delta manhole entry, and flat configurations and 5 feet for the MBTA and bridge crossings.”

At the April 5 hearing, there was some discussion that steel plating has the principal effect of redirecting EMFs to the left and right of the transmission lines, rather than in a more vertical bearing. Please provide modeling results that show the predicted EMF levels 10 feet and 25 feet on either side of the duct bank if it is buried less than 2.5 feet and a steel plate is placed over it.

NEP Response

For clarification, the only location on the construction drawings where steel plates are proposed is on Pleasant Street where the duct bank crosses under the MBTA bridge. In that location, the top of the concrete duct bank is less than 2.5' below grade, so two ¼" steel plates will be included over the duct bank to provide physical protection of the cable, not for MF mitigation.

There is ample evidence that placing a steel plate over a buried power line will result in some reduction of the magnetic field both directly above and a short distance to either side. However, the effectiveness of the plate will be determined by multiple factors, some of which might not be known until after installation of the plates. We have provided below an example from Electric Power Research Institute (EPRI)¹ that illustrates the effect of installing a steel plate above an example buried power line. In this example, the plate results in an approximately 25% reduction in the MF immediately above the duct bank centerline. At distances of approximately 6.6 feet (2m) or greater the reduction in MF levels is very small.

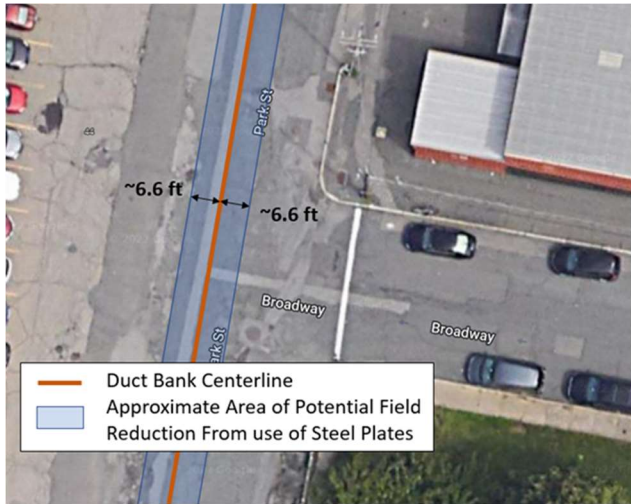


**Figure 7.4-2
Magnetic Field at Ground Level With and
Without Steel Plates (Cable Current: 600 A)**

To illustrate this concept shown from EPRI Figure 7.4-2 the figure below qualitatively shows an example of the transmission line route along Park Street. In this example, the duct bank centerline is shown running down the center of the street as an orange line and the blue-shaded area (approximately 6.6 ft [2m] to either side) shows that the only area in which a meaningful

¹ Electric Power Research Institute (EPRI). Electric and Magnetic Field Management Reference Book. First Edition, TR-114200: Palo Alto, CA, 1999.

MF reduction would occur would be in the street itself with no meaningful change in MF levels at the sidewalks and adjacent buildings.



Another example of the limited range of MF shielding around a steel plate is shown in Figure 9.1-2 below, also from the same EPRI report. The closer together the dashed lines are the higher the MF; the farther apart the lines, the lower the MF. The figure shows the greatest MF reduction just above the center of the plate with the effectiveness of this shielding diminishing with increasing distance. The circular contour lines at the left and right edges of the plate marked as 125mG indicate that the intensity of the MF is 125% (or an increase of 25%), which reflects the shunting of the MF from the center to the edges of the plate. That means that for an in-street installation, like here, the MF levels with a steel plate would be higher toward the adjacent sidewalks/buildings than they would be without the steel plate.

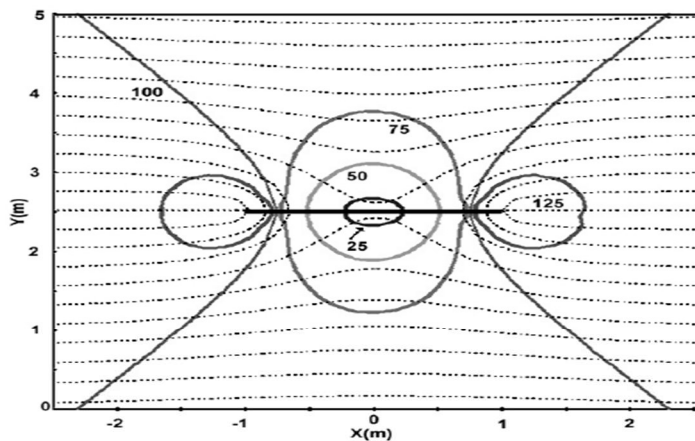


Figure 9.1-2
Flux Shunting Caused by a Long Plate of
Ferromagnetic Material. Horizontal Field $B = 100$
mG, Plate Width = 2 m, Thickness $W = 1$ cm, $\mu_r =$
1000, $\sigma = 0$. Flux Lines are Dashed, Contour
Lines are Solid.

As the Company has noted, it designed the new Cable so that MF levels are calculated to be a small fraction of the ICNIRP health guidelines. The Company does not believe that the use of steel plates to further reduce MF levels by a small amount is warranted, particularly where it would increase MF levels to the sides of the plates, may delay the Project, would increase costs, and may cause de-rating of the Cable, thereby reducing its reliability benefit.

- 3. During the Council meeting on April 19, a member of the public suggested that the King Street alternative, presented during the EFSB proceeding would be significantly cheaper than the route selected by National Grid. The EFSB Final Decision (at page 104) states the Company’s “Primary Route was estimated to cost \$81.2 million total, and the Noticed Alternative Route was estimated to cost \$83.6 million total.” [a] Please provide comparable cost information for the King Street alternative, and [b] confirm that the Primary Route was estimated, during the EFSB proceeding, to have the lowest cost of the alternatives considered. [c] If the Company has revised its estimates of the cost of the Primary Route, please provide that revised estimate and state whether the estimated cost of the Noticed Alternative Route has also changed and, if so, by what amount.**

NEP Response

[a] As an initial matter, it is important to note that the King Street Alternative was not an alternative route for the Project; rather, it was an entirely different way of serving the region once the existing cable was retired. The King Street Alternative was rejected at an early stage of evaluation for several reasons, including that it would involve substantial tree clearing, significantly greater environmental and social impacts, and would not provide a new 115 kV supply to the Beverly #12 Substation, thereby requiring an additional \$39 million in distribution upgrades on top of the \$110 million to construct the King Street Alternative. See Final Decision at 28-29). Because this alternative was rejected, the Company has not prepared a more refined cost estimate.

[b] NEP confirms that the Primary Route was estimated, during the EFSB proceeding, to have the lowest cost of the alternatives considered. Specifically, the EFSB found as follows: “The record identifies the Project along the Primary Route as the least cost alternative...” Final Decision at 107; see also id. at 26. As compared to the King Street Alternative, the EFSB agreed that the King Street Alternative was inferior to the Project, finding that: “An alternative of bringing power to East Beverly from the existing 115 kV King Street Substation in Groveland would involve using a route five times longer than that Project at a cost 50 per cent higher.” Final Decision at 28.

[c] In our recent letter dated May 5, 2022, NEP provided the most recent updated cost estimate for the Primary Route prepared in October, 2021 of \$91 million. The Company has not updated the cost estimate for the Noticed Alternative because it was not approved by the EFSB.

Additional Questions & Comments

- From the Council: Does the Project support the achievement of the State’s climate goals and, if so, how?

The Project does support the achievement of the State’s goals of reducing greenhouse gas emissions. The Project will bolster electric reliability in the Beverly-Cape Ann area, minimize maintenance and repair costs, and provide capacity for future area growth. As Massachusetts seeks to reduce carbon emissions by 50 percent by 2030 and to achieve net zero emissions by 2050, electrification of transportation and some heating will be an important component of that effort. Massachusetts has targeted to have 1,000,000 homes heated with electric air-source heat pumps by 2030 and to electrifying all new passenger vehicles by 2040. A modernized, reliable transmission system is needed to enable that electrification, and the proposed Beverly transmission line will serve as a vital piece of that endeavor.

It is worth also pointing out that the Company recently announced its vision to eliminate fossil fuels from both our gas and electric systems by 2050 – sooner if possible – setting clear and measurable milestones along the way. The Company’s plan for enabling a clean energy future, entitled *Our Clean Energy Vision: A Fossil-Free Future for Cleanly Heating Homes and Businesses*, is available at <https://www.nationalgrid.com/document/146251/download>.

- From Alyssa Raymond-Reed: On Thursday May19th, the Company requested and was provided with a document prepared by Ms. Raymond-Reed and submitted to Councilors Flowers and Houseman listing conditions she wanted imposed on the Project. While the Company will not address each proposal, it is important to make the following comments:

- Many of these ideas go beyond the Council’s statutory authority of ensuring that the installation of the new Cable “shall not incommode the public use of public ways” and, instead, address issues that are outside of the proper scope of the Board’s review of a grant of location petition.
- Ms. Raymond-Reed states that “While the RR is more costly, it is still possible.” This ignores all the facts, the opinion of the City’s own expert and the EFSB’s final decision. The Company is not going to reapply to the EFSB for approval of the MBTA right-of-way or any other route.
- The Company cannot accept any condition that could affect its ability to reliably operate the electrical system or the Cable itself. The proposal to prohibit the Company from ever increasing the voltage of the Cable is imprudent in the extreme and well beyond the Council’s authority. Moreover, it could actually be counterproductive since, as Dr. Bailey testified, an increase in the voltage could actually *reduce*, not increase, MF levels.
- The Company and its contractors are going to work diligently to ensure that construction is as least impactful as possible. Eliminating all disturbance, however, is unrealistic and not a standard to which other developers are held.

Where a resident or business believes that the Project caused damage, they will have access to a robust claims process. But the Company cannot agree to conditions like rehousing abutters during construction.

- Lastly, the Company is open to further discussion regarding mitigating impacts. The Company, however, cannot spend customer money on a community benefits package that includes things like upgrading playgrounds or fixing broken fences.

In closing, the Company repeats its request that its petition be approved at the City Council's next meeting.

Sincerely,

A handwritten signature in blue ink, appearing to read "Mark R. Kelly". The signature is fluid and cursive, with the first name "Mark" being the most prominent.

Assistant General Counsel & Director

cc: Lisa Kent, City Clerk
Tim O'Leary, NEP
Faith Hassell, NEP