

**THE STATE OF NEW HAMPSHIRE
BEFORE THE
PUBLIC UTILITIES COMMISSION**

PETITION OF PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE FOR
LICENSE TO CONSTRUCT AND MAINTAIN ELECTRIC LINES OVER AND
ACROSS THE NASHUA RIVER IN THE CITY OF NASHUA, NEW HAMPSHIRE.

TO THE PUBLIC UTILITIES COMMISSION:

Public Service Company of New Hampshire (“PSNH”), a public utility engaged in the generation, transmission, distribution and sale of electricity in the State of New Hampshire, hereby petitions the Public Utilities Commission (“Commission”), pursuant to RSA 371:17, for a license to construct and maintain electric lines over and across the public waters of the Nashua River in the City of Nashua, New Hampshire, and in support of its petition states as follows:

1. In order to meet the reasonable requirements of service to the public, PSNH has previously constructed and currently operates and maintains two overhead electric utility lines which cross over the Nashua River at two separate but nearby locations in the City of Nashua. These lines are designated as the 3891 and 18H1 lines. The 3891 line is a three phase 34.5 kV distribution line comprised of three 336 ACSR 18/1 conductor wires and a single 266 ACSR 6/7 neutral wire. The 18H1 is a three phase 4.16 kV distribution line, split over two separate circuits, each one consisting of three 336 ACSR 18/1 conductor wires and a single 4/0 ACSR 6/1 neutral. Both lines are integral parts of PSNH’s electric distribution system in the Nashua area. The existing Nashua River crossings of these lines were licensed in 1976 by Commission Order No. 12,219, in Docket DE 76-22. Specifically, these crossings are identified on Appendices 37B1, 37B2, 37B3 and 37B4 of the PSNH filing referenced in that Order.

2. The existing 3891 and 18H1 line crossings are being relocated and rebuilt to accommodate the public roadway and bridge improvements associated with the New Hampshire Department of Transportation (“NHDOT”) Broad Street Parkway project (NHDOT Project No. 16110B, Federal Project No. A002(937)), which is being constructed in collaboration with the City of Nashua through the downtown Nashua area. The lines will be relocated and rebuilt in a double circuit configuration across the River at a single location, at approximately the same location as the existing 18H1 line crossing.

3. The location of this proposed new crossing of the Nashua River is shown on the attached location map, marked as Exhibit 1.

4. The design and proposed construction of the crossing is shown on the attached PSNH Energy Delivery Plan and Profile Drawing entitled “3891 & 18H1 LINES NASHUA RIVER WATER CROSSING, PLAN & PROFILE NASHUA, NEW HAMPSHIRE”, marked as Exhibit 2.

5. The required technical information provided in this petition is based on the 2007 National Electrical Safety Code (NESC) C2-2007 and conforms to the NESC 2012 update.

6. The proposed crossing will occur between two new wood structures with a span length of approximately 325 feet. The 3891 line will be rebuilt comprised of three 477 ACSR 18/1 conductor wires. The 18H1 line will be rebuilt comprised of two Hendrix spacer cable circuits, each comprised of three 477 kcmil 34.5 kV spacer conductor wires and a 7 no. 6 messenger wire. At the crossing the messenger wires will serve as the neutral wires for both the 3891 and 18H1 lines. The structure on the east side of the river, number 3891/44, is a double arm tangent structure, constructed with a single class H3, 55' foot tall western red cedar (WRC) pole. The structure on the west side of the river, number 3891/43, is a transition structure, with dead ends on all three wire sections. The 3891 line splits off back over to the current alignment away from the river and the 18H1 lines continue through to their current alignment. Structure 3891/43 will be constructed with a single class H3, 60' foot tall WRC pole. The construction details for these structures are attached as Figures 3 (structure #43) and 4 (structure #44).

7. 10 year flood water elevations for the Nashua River are identified in volume 3 of the Flood Insurance Study for Rockingham County, New Hampshire, Flood Profile 161P effective date May 17, 2005 issued by the Federal Emergency Management Agency (FEMA). Additional information is found in the Flood Insurance Rate Map, Hillsborough County, New Hampshire (all jurisdictions) panel 513 of 701, Map Number 3301C0513D, with an effective date of September 25, 2009. The 10-year flood elevation for the river in this location is approximately 122 feet. This elevation is based on the North American Vertical Datum of 1988 (NAVD 88).

8. The area of the Nashua River at the design flood level as defined by NESC (note 19 to Table 232-1) is 25.4± acres. The required clearance for conductors and messenger wires are 28.5' and 25.5' respectively.

9. Using the above design criteria, the maximum sags of the phase and neutral wires and minimum clearances for the crossing have been determined and designed as follows (note that the clearances listed are for the 18H1 since it will be mounted lower than the 3891 and that with spacer cable construction the weather case of the messenger wire will govern the sag):

- A. NESC Heavy, Phase Wire – For the sag on the phase wires under this condition, the minimum clearance to land is 26.2'; the minimum clearance to the 10 year flood level is 36.4'.
- B. Minus 20° F, Phase Wire – For the sag on the phase wires under this condition, the minimum clearance to land is 28.5'. The minimum clearance to the 10 year flood level is 38.6'.
- C. 212° F, Phase Wire – For the sag on the phase wires under this condition, the minimum clearance to land is 27.0'. The minimum clearance to the 10 year flood level is 37.1'.

- D. NESC Heavy, Neutral Wire – For the sag on the neutral wire under this condition, the minimum clearance to land is 28.2'. The minimum clearance to the 10 year flood level is 38.4'.
- E. Minus 20° F, Neutral Wire – For the sag on the neutral wire under this condition, the minimum clearance to land is 30.5'. The minimum clearance to the 10 year flood level is 40.6'.
- F. 120° F, Neutral Wire - For the sag on the neutral wire under this condition, the minimum clearance to land is 29.0'. The minimum clearance to the 10 year flood level is 39.1'.
- G. Minimum Clearance, Phase Wire – The NESC Heavy conditions (item A above), results in the minimum clearance for phase conductors. The minimum clearances expected under those conditions are 26.2' to land and 36.4' to the 10 year flood level. The required minimum clearance from the phase wires to land based on NESC Table 232-1.2 is 18.5'. The required minimum clearance from phase wire to the water surface based on NESC Table 232-1.7.b, is 28.5'. The crossing design as proposed exceeds the NESC requirements.
- H. Minimum Clearance, Neutral Wire – The NESC Heavy conditions (item D above), results in the minimum clearance for the neutral wire. The minimum clearances expected under that condition is 28.2' to land and 38.4' to the 10 year flood level. The required minimum clearance from the neutral to land based on NESC Table 232-1.2 is 15.5'. The required minimum clearance from the neutral wire to the water surface based on NESC Table 232-1.7.b, is 25.5'. The crossing design as proposed exceeds the NESC requirements.
- I. Minimum Phase to Neutral Clearance –The conditions which would result in the minimum clearance between these lines is with the phase wires on the 3891 line operating at 212°F and the 18H1 messenger at 60° F. Under those conditions the phase to neutral clearance would be 3.12'. Based on NESC Table 235-6 section 2a, the minimum clearance should be 16.5 inches (1.37 feet)

10. There are no New Hampshire Department of Environmental Services or NHDOT permits necessary specifically for the construction of this crossing.

11. The proposed crossing has been designed and will be constructed, maintained and operated by PSNH in accordance with the NESC.

12. The new poles and wires associated with this crossing are located within easements owned by PSNH on each side of the Nashua River.

13. PSNH submits that the license petitioned for herein may be exercised without substantially affecting the rights of the public in the public waters of the Nashua River. Minimum safe line clearances above the river surface and affected shorelines will be maintained at all times. The use and enjoyment by the public of the river will not be diminished in any material respect as a result of the overhead line crossing.

WHEREFORE, PSNH respectfully requests that the Commission:

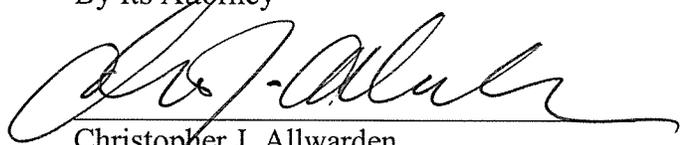
- a. Find that the license petitioned for herein may be exercised without substantially affecting the public rights in the public waters which are the subject of this petition;
- b. Grant PSNH a license to construct and maintain electric lines over and across the public waters of the Nashua River in Nashua, New Hampshire, as specified in the petition; and
- c. Issue an Order Nisi and orders for its publication.

Dated at Manchester this 30TH day of August, 2013.

Respectfully submitted,

PUBLIC SERVICE COMPANY OF NEW
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By Its Attorney



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