

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

PETITION OF PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, DOING BUSINESS AS EVERSOURCE ENERGY, FOR LICENSE TO CONSTRUCT AND MAINTAIN ELECTRIC LINES OVER AND ACROSS THE MERRIMACK RIVER IN THE TOWNS OF MERRIMACK AND LITCHFIELD, NEW HAMPSHIRE.

TO THE PUBLIC UTILITIES COMMISSION:

Public Service Company of New Hampshire, doing business as Eversource Energy ("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 Merrimack River in the Towns of Merrimack and Litchfield, 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, a three-phase 34.5 kV distribution line, designated as the 3750 Line, in the Towns of Merrimack and Litchfield, New Hampshire, which is an integral part of PSNH's electric distribution system in the area. The 3750 Line crosses over the Merrimack River between Merrimack and Litchfield, and the crossing has been previously licensed by the Commission as the 3020X2 line<sup>1</sup> under Commission Order No. 12,928, dated October 7, 1977, in Docket DE 77-115.

2. PSNH intends to reconstruct the current crossing of the 3750 Line over the Merrimack River. Reconstruction of the crossing is necessary to meet greater elevation specifications for aerial crossings of wires at this location of the Merrimack River required by the U.S. Army Corps of Engineers, as more specifically described in section 10 below.

3. The reconstructed 3750 Line will cross over the Merrimack River approximately 4.95 miles north-northwest of the Route 111-A bridge, in the same location as the current crossing.

4. The location of the proposed crossing of the Merrimack River is shown on the attached Location Map entitled "LOCUS MAP, 3750 LINE 34.5kV, MERRIMACK RIVER WATER CROSSING, MERRIMACK & LITCHFIELD, NEW HAMPSHIRE", marked as Exhibit 1.

5. The design and proposed construction of the crossing is shown on the attached Eversource Distribution Business Plan and Profile Drawing entitled "3750 LINE (34.5kV), CROSSING BETWEEN STR. 8 & STR. 9, MERRIMACK RIVER CROSSING, MERRIMACK & LITCHFIELD, NH", marked as Exhibit 2.

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<sup>1</sup> This line number designation was subsequently changed by PSNH to 3750.

6. The required technical information provided in this petition is based on the 2012 National Electrical Safety Code (NESC) C2-2012.

7. The proposed crossing will occur between two new wood structures with a span length of approximately 736 feet. The structure on the west side of the river, number 3750/8, is a deadend structure, constructed with three class H1, 95 foot tall round wood poles. The structure on the east side of the river, number 3750/9, is a deadend structure, constructed with three class H1, 100 foot tall round wood poles with a push brace. The construction detail for the deadend structure type to be used is attached as Figure DTR 10.615. The conductors transmitting electrical power at 34.5 kV will be 477 ACSR "Pelican" cable with 18/1 stranding. The neutral will be 4/0 ACSR "Penguin" cable with 6/1 stranding. The conductors will be sagged using NESC Heavy Loading conditions (0° F, 4 pounds psf wind loading, and ½" radial ice) at a maximum tension of 3,000 pounds. The neutral will be sagged using NESC Heavy Loading conditions (0° F, 4 pounds psf wind loading, and ½" radial ice) at a maximum tension of 2,000 pounds.

8. Flood water elevations for the Merrimack River in this area are identified on Flood Insurance Rate Map (FIRM), Hillsborough County, New Hampshire, Panel 503 of 701, Map Number 33011C0503E, and effective date September 25, 2009 issued by the Federal Emergency Management Agency (FEMA). Additional information is found in the Flood Insurance Study (FIS), Number 33011CV001A, Volume 1 of 5, Hillsborough County, New Hampshire issued by FEMA on September 25, 2009. The 10-year flood elevation for the river in this location is approximately 102.75 feet. This elevation is based on the North American Vertical Datum of 1988 (NAVD88).

9. The surface area of the Merrimack River at the design flood level as defined by NESC (note 19 to Table 232-1) is approximately 120± acres. For the purposes of calculating surface area for clearance the 10-year flood area is used as suggested by the NESC (note 18 to Table 232-1).

10. In addition to the NESC minimum clearance requirements, the U.S. Army Corps of Engineers (ACOE), New England District, issued Permit Number NAE-2010-02435, effective January 30, 2012, covering wires crossing over the Merrimack River in the vicinity of where the 3750 Line is crossing the River. This permit requires, per Special Condition No. 1, that all aerial wires transmitting power at voltages of 115kV or below shall at no time be lower in elevation than 148.91 feet NAVD88. It also requires that all communication and other aerial wires shall at no time be lower in elevation than 138.91 feet NAVD88. The ACOE's Special Condition No. 1 is detailed in the attached ACOE letter.

11. Using the above design criteria, the maximum sags of the conductors and neutral and minimum clearances for the crossing have been determined and designed as follows (note that only the lowest conductor wire is considered and reported, for clarity):

- A. NESC Heavy, Conductor – For the sag on the conductor under this condition, the minimum clearance to land is 71.97'. The minimum clearance to the 10-year flood level is 64.02'.

- B. 60° F, Conductor – For the sag on the conductor under this condition, the minimum clearance to land is 71.22'. The minimum clearance to the 10-year flood level is 59.88'.
- C. 212° F, Conductor – For the sag on the conductor under this condition, the minimum clearance to land is 70.48'. The minimum clearance to the 10-year flood level is 55.69'.
- D. NESC Heavy, Neutral – For the sag on the neutral under this condition, the minimum clearance to land is 64.84'. The minimum clearance to the 10-year flood level is 51.97'.
- E. 60° F, Neutral – For the sag on the neutral under this condition, the minimum clearance to land is 64.19'. The minimum clearance to the 10-year flood level is 46.05'.
- F. 120° F, Neutral – For the sag on the neutral under this condition, the minimal clearance to land is 63.93'. The minimum clearance to the 10-year flood level is 44.74'.
- G. Minimum Clearance, Conductor – The 212° F, conductor condition (item C above), results in the minimum clearance for conductors to the land and water surfaces. The minimum clearances expected under this condition are 70.48' to land and 55.69' to the 10-year flood level. The lowest elevation of the conductor at this condition is 158.44' NAVD88. The required minimum clearance from 34.5kV conductors to land based on NESC Table 232-1.2 is 18.5'. The required minimum clearance from 34.5kV conductors to the water surface based on NESC Table 232-1.7.b, is 28.5'. The crossing design as proposed exceeds both the NESC and ACOE requirements.
- H. Minimum Clearance, Neutral Wire – The 120° F, neutral condition (item F above), results in the minimum clearance for the neutral to the land and water surfaces. The minimum clearances expected under this condition are 63.93' to land and 44.74' to the 10-year flood level. The lowest elevation of the neutral at this condition is 147.49' NAVD88. 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 to the water surface based on NESC Table 232-1.7.b, is 26.0'. The crossing design as proposed exceeds both the NESC and ACOE requirements.

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

13. New Structure 3750/8 is located within property owned by PSNH. New Structure 3750/9 is located in an existing easement owned by PSNH. Therefore, no new or additional real property rights are required to construct this crossing.

14. 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 Merrimack 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.

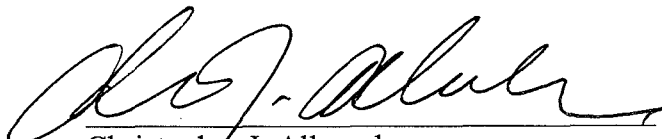
WHEREFORE, PSNH respectfully requests that the Commission:

- 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 Merrimack River in Merrimack and Litchfield, New Hampshire, as specified in the petition; and
- c. Issue an Order Nisi and orders for its publication.

Dated at Manchester this 7<sup>th</sup> day of July, 2015.

Respectfully submitted,

PUBLIC SERVICE COMPANY OF NEW  
HAMPSHIRE, DOING BUSINESS AS  
EVERSOURCE ENERGY  
By Its Attorney



Christopher J. Allwarden  
Senior Counsel, Legal Department  
Eversource - Energy Park  
780 North Commercial Street  
Manchester, NH 03101  
(603) 634-2459