

**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 ASHUELOT RIVER IN THE CITY OF KEENE, 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 Ashuelot River in the City of Keene, 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 12.47 kV distribution line, designated as the W14 circuit, in Keene, New Hampshire, which is an integral part of PSNH’s electric distribution system in the area. As originally constructed, the W14 line crossed over the Ashuelot River parallel to the Court Street bridge across the River. To the best of PSNH’s knowledge, the original water crossing at this location was not originally licensed by the Commission.

2. In 2009, the W14 line crossing was temporarily relocated by PSNH to cross the Ashuelot River over an existing pedestrian bridge approximately 250 feet north of the Court Street bridge location. This temporary relocation was made to accommodate a New Hampshire Department of Transportation bridge replacement project for the Court Street bridge. The NHDOT bridge project has recently been completed. PSNH now proposes to rebuild the W14 line crossing of the Ashuelot River in its original crossing location parallel to the new Court Street bridge, and to newly license this water crossing with the Commission.

3. The location of this proposed crossing of the Ashuelot 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 Distribution Business Plan and Profile Drawing entitled “W14 LINE – 12.47 KV, BETWEEN STRUCTURES 192/103 & 192/104, ASHUELOT RIVER WATER CROSSING, PLAN & PROFILE”, 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.

6. As shown on Exhibit 2, the proposed new crossing will occur between two wood structures with a span length of approximately 217 feet. The structure on the north side of the Ashuelot River, number 192/103, is a tangent structure, constructed with a single class 2, 45' foot tall CCA pole. The structure on the south side of the River, number 192/104, is also a tangent structure, constructed with a single class 2, 45' foot tall CCA pole. The construction detail for tangent structures is attached as Exhibit 3. 1/0 ACSR cable with 6/1 stranding will be used for all three conductors and the neutral. The conductors and neutral wire will be sagged using NESC Heavy Loading conditions (0° F, 4 pounds psf wind loading, ½" radial ice) at a maximum tension of 2,000 pounds. Structure 192/104 will also have a single phase tap for Starling Street, but this tap does not affect the crossing.

7. Flood water elevations for the Ashuelot River in this area are identified on Flood Insurance Rate Map, Cheshire County, New Hampshire, Panel 258 of 610, Map Number 33005C0258E, effective date May 23, 2006 issued by the Federal Emergency Management Agency (FEMA). Additional information is found in the Flood Insurance Study, Volume 1 of 2, Cheshire County, New Hampshire (all jurisdictions) issued by FEMA on May 23, 2006. The 10-year flood elevation for the River in this location is approximately 478.5 feet. This elevation is based on the National Geodetic Vertical Datum of 1929 (NGVD 29).

8. The area of the Ashuelot River at the design flood level as defined by NESC (note 19 to Table 232-1) is 74± acres. For the purposes of calculating surface area for clearance the 100-year flood elevation was used since it is readily available. This is higher than the 10-year flood elevation required by the NESC and provides a conservative clearance requirement.

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 (due to the proximity of the bridge structure, the centerline elevation of the bridge was assumed as the reference point for clearances to land, this is more conservative than measuring to actual ground):

- A. NESC Heavy, Phase Wire – For the sag on the phase wires under this condition, the minimum clearance to land is 30.1'; the minimum clearance to the 10 year flood level is 40.9'.
- B. Minus 20° F, Phase Wire – For the sag on the phase wires under this condition, the minimum clearance to land is 32.9'. The minimum clearance to the 10 year flood level is 43.8'.
- C. 212° F, Phase Wire – For the sag on the phase wires under this condition, the minimum clearance to land is 30.3'. The minimum clearance to the 10 year flood level is 41.2'.
- D. NESC Heavy, Neutral Wire – For the sag on the neutral wire under this condition, the minimum clearance to land is

23.3'. The minimum clearance to the 10 year flood level is 34.1'.

- E. Minus 20° F, Neutral Wire – For the sag on the neutral wire under this condition, the minimum clearance to land is 26.0'. The minimum clearance to the 10 year flood level is 36.9'.
- F. 90° F, Neutral Wire - For the sag on the neutral wire under this condition, the minimum clearance to land is 24.8'. The minimum clearance to the 10 year flood level is 35.7'.
- 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 30.1' to land and 40.9' 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 23.3' to land and 34.1' 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 a winter condition with the phase wires at NESC Heavy Loading (item A above) and the neutral at - 20° F (item E above). This could occur after an ice storm if the neutral shed ice before the conductors. Under those conditions the phase to neutral clearance would be 4.0'. Based on NESC Table 235-6 section 2a, the minimum clearance should be 13.8 inches (1.15 feet).
- J. Bridge Clearance – The nearest proposed conductor will be located directly over the bridge. The required minimum clearance from the conductors to a bridge based on NESC table 234-2.1.b. is 12.0'. The actual clearance to the conductor wire at NESC Heavy conditions would be 19.3'.

This was calculated as the nearest distance to the bridge with an assumed railing height of 48". The crossing design as proposed exceeds the NESC requirements.

10. There are no New Hampshire Department of Environmental Services 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 poles associated with this crossing are located within the street right of way for Court Street which is administered by the City of Keene. A pole license for the location of the poles has been issued to PSNH by the City.

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 Ashuelot River. Minimum safe line clearances above the Ashuelot 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 Ashuelot River in Keene, New Hampshire, as specified in the petition; and
- c. Issue an Order Nisi and orders for its publication.

Dated at Manchester this 25th day of October, 2011.

Respectfully submitted,

PUBLIC SERVICE COMPANY OF NEW
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By Its Attorney



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