

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

PETITION OF PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE FOR A LICENSE TO CONSTRUCT AND MAINTAIN ELECTRIC LINES, STATIC WIRE AND FIBER OPTIC CABLE OVER AND ACROSS THE COCHECO RIVER IN THE CITY OF ROCHESTER AND THE ISINGLASS RIVER IN THE TOWN OF STRAFFORD, 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 maintain electric lines, static wire and fiber optic cable over and across the public waters of the Cocheco River in the City of Rochester and the Isinglass River in the Town of Strafford, 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 345 kV transmission line, designated as Line 385. The 385 Line connects PSNH’s 345kV Deerfield Substation in Deerfield, New Hampshire, to an existing 345kV overhead transmission line in Maine, and is an integral part of the PSNH transmission system and the overall New England transmission grid. The 385 Line, as presently constructed, crosses the public waters of the Cocheco River in the City of Rochester, New Hampshire, and the Isinglass River in the Town of Strafford, New Hampshire. The existing 385 Line crossing of the Cocheco River has been previously licensed by the Commission in Order #9777 dated August 26, 1969, in Docket D-E5700.¹
2. In order to increase PSNH’s communication system reliability in the southern and eastern part of the state for the operation of its electric power system, PSNH intends to upgrade to fiber optic capacity by replacing an existing overhead static wire on the 385 Line with an overhead optical ground wire cable (OPGW cable). Currently, the 385 Line contains three bundled conductors (850.8 ACSR 45/7) and two shield wires (7#8 Alumoweld). This project will replace one of the two

¹ Order #9777 also licensed the crossing of the 385 Line over the Salmon Falls River in Rochester at the State of Maine border, but that crossing is not a part of the project covered by this petition, and will not be affected or changed. The 385 Line crossing of the Isinglass River was not previously licensed due to either oversight, or to the application of navigability or other crossing license criteria at the time of original construction. The upgrade of the 385 Line crossing of the Isinglass River will be newly licensed under this petition.

existing shield wires with an OPGW cable for approximately 18 miles between structures 8 and 169. The fiber optic cable will be installed at a height that is always greater than the height of the conductor, and the sag of the fiber optic cable will never be below the sag of the conductor. Therefore, the conductor clearance over the public waters will not change or be affected by this project. The in-service date for this project has tentatively been set for early October, 2012. To support project construction to meet this date, the 385 Line is scheduled to be removed from service beginning September 5, 2012, through September 30, 2012.

3. The existing H-frame structures at each crossing (structures 15 & 16 at the Cocheco River, and 87 & 88 as the Isinglass River) will remain with no modifications to the existing phase wires or their heights. The clearances between the new fiber optic cable and the existing conductors have been verified and are reviewed in Appendices A and B. Further, the structures will be reinforced by engineering or have been determined to be structurally sound and able to accept the increased loads imparted by the larger cable diameter. All structural checks used NESC Section 26 Grade B construction requirements.
4. The general location of the 385 Line Cocheco River and Isinglass River crossings are shown on the U.S. Geologic Survey location plans attached hereto and marked as EXHIBITS 1 and 3, respectively.
5. The design and proposed construction of each crossing is shown on the attached Public Service of New Hampshire Transmission Business plan and profile drawings entitled "385 LINE (345 kV) CROSSING BETWEEN STRUCTURES 15 & 16 COCHECO RIVER CROSSING, ROCHESTER, NEW HAMPSHIRE", marked as Exhibit 2, and "385 LINE (345 kV) CROSSING BETWEEN STRUCTURES 87 & 88 ISINGLASS RIVER CROSSING, STRAFFORD, NEW HAMPSHIRE", marked as Exhibit 4, respectively. The required clearance calculations for the new crossings are attached to this petition as Appendix A and Appendix B.
6. The required technical and design information provided in this petition is based on the 2012 National Electrical Safety Code (NESC) C2-2012, which more than meets and/or exceeds the 2007 NESC.
7. The Cocheco River and Isinglass River will be spanned on existing round wood structures. These structures are two-pole tangent structures (Types EA-1 and EA-2). A detail design specification for these structure types is attached to this petition as FIGURES 1 and 2.
8. Flood water elevations for the crossings were calculated based on information found on FEMA flood maps. Clearance required to the 10-yr flood elevation in

accordance with note 18 Section 232 of the NESC Code will meet or exceed this level. All elevations are based on NAVD 88 datum.

9. Based on Table 232-1.7 of the NESC, for open supply conductors 750 V to 22 kV to ground, the minimum clearance to the water surface during normal flood level for water bodies not suitable for sail boating is 17.0'. Minimum clearances to water bodies suitable for sail boating is 20.5' (for waters less than 20 acres), and 28.5' (for waters 20 to 200 acres). NESC Rule 232.C.1.a states that the minimum clearance increases by 0.4 inches for every kilovolt in excess of 22 kV. It also specifies that at voltages above 50 kV the minimum clearance is based on phase to ground voltage of the line. Based on this rule, an additional clearance of 5.9' or $[(199.2 \text{ kV} - 22 \text{ kV}) \times 0.4] / 12$ is needed for 345 kV, which brings the total required minimum clearance to 22.9' (for water bodies deemed not sailable), 26.4' (for sailable waters less than 20 acres), and 34.4' (for sailable waters 20 to 200 acres). For overhead shield/surge protection wires and OPGW cables that meet NESC Rule 230.E.1, the minimum clearance to the water surface at the normal flood level is 25.5'. As the static wire and fiber optic cable are located above the phase wires at all crossings, this NESC minimum clearance requirement will always be met. Minimum distances to the road for truck traffic, based on Table 232-1.2 of the NESC for open supply conductors for 750V to 22kV to ground is 18.5'. With the additional 5.9' of clearance required for 345 kV, the total required clearance is 24.4'.
10. The crossing locations detailed above have a total of six phase wires and two shield wires spanning the water body. All six 850.8 ACSR 45/7 phase conductors and static wires were sagged using the NESC Heavy Loading (0 degrees F., 4 pounds per square foot wind loading, ½-inch radial ice) sag charts upon original installation in the field. The 850.8 ACSR conductors were sagged using a maximum tension of 7,000 pounds at NESC Heavy Load conditions. The 7#8 Alumoweld static wires were sagged using a maximum tension 3,500 pounds respectively at NESC Heavy Load conditions. As part of this project, one of the static wires will be removed and replaced with an OPGW fiber optic cable. The OPGW will be sagged using a maximum tension of 5,000 pounds at NESC heavy loading conditions. The tensions and clearances of the OPGW cable will be confirmed by survey at the time of the transfer to ensure the tensions have not been affected and will be re-tensioned to the original values if necessary. The sag and clearance to the water surface for the proposed crossing is provided in the attached Appendices. Again, it is important to note that the existing conductors, which hang lower than the future OPGW cable, will not change or be affected during this project.
11. There will be no new crossing structures and therefore no structures need to be set inside of jurisdictional wetlands or other areas that require New Hampshire Department of Environmental Services (NHDES) permitting or any other regulatory agency permitting at the location of the crossing.

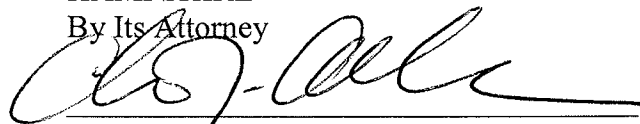
12. An Army Corps permit is not required for any of the crossings listed above as they are not federally designated navigable waters.
13. The proposed crossings have been designed and will be constructed, maintained and operated by PSNH in accordance with the applicable requirements of the NESC.
14. PSNH owns the land in fee for its lines and facilities on the West side of the Cochecho River in Rochester, and also owns the land in fee (excluding Little Falls Bridge Road) for its lines and facilities on the East side. PSNH owns not less than 270' in width of permanent easement for its lines and facilities on the West side of the Isinglass River in Strafford, and owns the land in fee on the East side of the river. All crossings will be installed within the limits of the easements and the PSNH owned land.
15. 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 Cochecho River and Isinglass River. Minimum safe line clearances above all water surfaces and affected shorelines will be maintained at all times. The use and enjoyment by the public will not be diminished in any material respect as a result of the overhead line and cable crossings.

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, static wire and fiber optic cable over and across the public waters as specified in the Petition; and
- c. Issue an Order Nisi and orders for its publication.

Dated at Manchester this 29th day of JUNE, 2012.

Respectfully submitted,
PUBLIC SERVICE COMPANY OF NEW
HAMPSHIRE
By Its Attorney



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