

**DE 04-181**

**PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE**

**Petition for License to Construct and Maintain Electric Lines Over and Across the Public Waters of the Merrimack River in the City of Manchester, New Hampshire and the Town of Bedford, New Hampshire**

**Order *Nisi* Granting License to Construct and Maintain Electric Lines Over and Across Public Waters**

**ORDER NO. 24,414**

**December 22, 2004**

On October 5, 2004, Public Service Company of New Hampshire (PSNH) filed a petition with the New Hampshire Public Utilities Commission (Commission) for a license to construct and maintain two three-phase aerial electric lines, a shield wire, and a neutral (Facilities) over and across the Merrimack River in the City of Manchester, New Hampshire and the Town of Bedford, New Hampshire. PSNH supplemented its filing with revised data on December 14, 2004. PSNH filed the Petition pursuant to RSA 371:17, which requires a utility to obtain a license from the Commission before constructing utility facilities across any public waters.

The Facilities will replace the existing 321 34.5 kilovolt (kV) crossing with one three-phase aerial electrical crossing, and will also replace the existing 321 line neutral crossing at the same location. Facilities construction will maintain the centerline of the existing 321 34.5 kV crossing. The Facilities will each be built on single towers. According to PSNH, the existing 322 34.5 kV crossing will remain in place.

PSNH states that the Facilities will consist of a new 115 kV transmission line that will connect the PSNH Huse Road Substation to the new Bedford Substation. The new 115 kV line will be designated the M-164 line and will traverse a distance of 2.25 miles in an existing

PSNH right of way. A rebuild of the existing 321 34.5 kV line will also be constructed on the same structures. According to PSNH, the new line crossing is located on the north side of three existing line crossings of the Merrimack River, just north of the Manchester Waste Treatment Plant. The Commission previously granted PSNH a license for the existing line crossings by Order No. 12,219 (Docket 76-22). PSNH states that this crossing is part of a larger facilities project referred to as the Tioga Power Project.

PSNH attests that the new construction is necessary due to load growth and to improve reliability. PSNH states that with a project load growth of 5.4 percent in the Manchester area, and in consideration of PSNH system design requirements, seven 115/34.5 kV transformers in Manchester, Merrimack, and Derry, New Hampshire are operating either at, above, or just below their nameplate ratings. Loss of the I-158 115 kV line between Scobie Pond and Huse Road Substations would result in the loss of two 115/34.5 kV transformers at Huse Road and the initial loss of 90-100 MW of load in the Manchester/Bedford area. In order to restore service to customers, PSNH will exceed its design criteria of 3 load block transfers and a reasonable number of switching steps. The Tioga Power Project addresses these concerns by providing a looped 115 kV feed (the new M-164 line) to the Huse Road Substation and installing two new 115/34.5 kV transformers at the new Bedford Substation

In support of its petition, PSNH submitted a location plan (Exhibit No. 1) and a plan and profile drawing of the crossing (Exhibit No. 2, revised). PSNH states that the construction of the new crossing will consist of the following: a dead-end structure #2, a 75 foot double circuit single steel pole with steel davit arms on a foundation, Type SDE-1, on the westerly side; and a dead-end structure #3, an 80 foot double circuit single steel pole with steel

davit arms on a foundation, Type SDE-1, on the easterly side. PSNH indicates that the span between these two structures will be 776 feet.

The Facilities will be installed on Structures #2 and #3 as follows. The shield wire (Brugg 24 Fiber OPGW, 0.571" outside diameter) will be at the top of the structure. The top pair of davit arms will be 8.5 feet long and will be positioned 16.0 feet below the shield wire. They will carry two of the three 1272 MCM ACSR 45/7 conductors of the 115 kV circuit. The middle pair of davit arms will be 14.5 feet long and will be positioned 10.0 feet below the top davit arms. They will carry the third 1272 MCM ACSR 45/7 conductor and one of the three 477 MCM ACSR 26/7 conductors of the 34.5 kV circuit. The lowest pair of davit arms will be 8.5 feet long and will be positioned 8.0 feet below the middle davit arms. They will carry the remaining two 477 MCM ACSR 26/7 conductors. The 4/0 ACSR 6/7 neutral will be attached to the pole 5.0 feet below the lowest davit arms.

PSNH has determined that according to National Electrical Safety Code (NESC) Table 232-1, Note 19, the design water surface area for the crossing is 70 acres. For water areas of 20 to 200 acres that are suitable for sailing, NESC (Table 232-1) requires that the neutral conductor clearance to the water surface be 25.5 feet and 28.5 feet for the 34.5 kV phase conductors (477 MCM ACSR 26/7). The NESC (Table 232-1 adjusted for voltages above 22 kV by rule 232.1.a) also requires that the clearance to the water surface be 30.1 feet for the 115 kV phase conductors (1272 MCM ACSR).

PSNH states that all phase conductors and the neutral conductor will be sagged to NESC, ANSI C2-2002 (NESC) Heavy Loading (0 degrees Fahrenheit, 4 pounds per square foot wind loading, and ½ inch radial ice) conditions. Tensions at NESC Heavy Loading conditions

will be 3200 pounds for the 4/0 ACSR 6/7 neutral conductor, 4800 pounds for the 477 MCM ACSR 26/7 34.5 kV conductors, and 9000 pounds for the 1272 MCM ACSR 47/7 115 kV conductors. The maximum neutral conductor sag will occur at a conductor temperature of 120 degrees Fahrenheit (F). At this conductor temperature, the neutral conductor will remain 26.1 feet above the Merrimack River 10 year flood level of 121.3 feet.

The maximum phase conductor sag for the 34.5 kV conductors will occur at a conductor temperature of 212 degrees F. At this elevated conductor temperature, the lowest 34.5 kV phase conductors remains 28.7 feet above the Merrimack River 10 year flood level of 121.3 feet. The maximum phase conductor sag for the 115 kV conductors will occur at a conductor temperature of 284 degrees F. At this elevated conductor temperature, the lowest 115 kV phase conductor remains 37.7 feet above the Merrimack River 10 year flood level of 121.3 feet.

According to PSNH, all crossing construction will be in upland areas and the installation methods to be used in the construction of the M-164/321 transmission line will avoid impacts to any wetlands in the areas of the crossing, and therefore no wetlands permits are required. PSNH has stated that PSNH owns permanent easement rights for the construction, operation, and maintenance of overhead electric lines on the east side of the crossing where Structure #3 will be constructed and owns the land in fee on the west side of the crossing where Structure #2 will be constructed.

PSNH has stated that the use and enjoyment by the public of these waters will not be diminished in any material respect as a result of the proposed aerial line crossings. PSNH further attests that the construction of the aerial electric lines will meet or exceed the requirements of the National Electrical Safety Code, ANSI C2-2002.

RSA 371:17 provides in part that whenever it is necessary, in order to meet the reasonable requirements of service to the public, that any public utility should construct a line of poles or towers and wires and fixtures thereon over or across any of the public waters of New Hampshire, it shall petition the Commission for a license to construct and maintain the same. “Public waters,” as defined in RSA 371:17, means “all ponds of more than ten acres, tidewater bodies, and such streams or portions thereof as the Commission may prescribe.” Based on the information presented, the part of the Merrimack River under the proposed aerial electric lines are “public waters” under RSA 371:17.

Based on the information presented by PSNH and Staff’s recommendation, we find such crossing necessary for PSNH to meet the reasonable requirements of reliable service to the public within PSNH’s authorized franchise area and the requested license may be exercised without substantially affecting the public rights in the waters of the Merrimack River. We find that the crossing is in the public good and we will approve the petition on a *Nisi* basis in order to provide any interested party the opportunity to submit comments on said petition or to request a hearing.

**Based upon the foregoing, it is hereby**

**ORDERED *NISI***, that subject to the effective date below, PSNH is authorized, pursuant to RSA 371:17 et seq., to construct, maintain and operate the aerial electric lines over and across the Merrimack River in the City of Manchester, New Hampshire and the Town of Bedford, New Hampshire depicted on plans and drawings submitted October 5, 2004 (Exhibits No. 1 and No. 2) and revised on December 14, 2004, and on file with this Commission; and it is,

**FURTHER ORDERED**, that that PSNH operate this new crossing in conformance with the NESC; and it is

**FURTHER ORDERED**, that PSNH shall provide a copy of this order to the (i) City Clerk of Manchester and the Town Clerk of Bedford, (ii) New Hampshire Attorney General and the owners of the land bordering on said public waters at the location of the river crossing, pursuant to RSA 371:19, and (iii) pursuant to RSA 422-B:13, New Hampshire Department of Transportation and the Office of Secretary, U.S. Department of Commerce, by first class mail, no later than December 31, 2004 and to be documented by affidavit filed with this office on or before January 21, 2005; and it is

**FURTHER ORDERED**, that PSNH shall cause a copy of this Order *Nisi* to be published once in a statewide newspaper of general circulation or of circulation in those portions of the state where operations are conducted, such publication to be no later than December 31, 2004 and to be documented by affidavit filed with this office on or before January 21, 2005; and it is

**FURTHER ORDERED**, that all persons interested in responding to this petition be notified that they may submit their comments or file a written request for a hearing which states the reason and basis for a hearing no later than January 7, 2005 for the Commission's consideration; and it is

**FURTHER ORDERED**, that any party interested in responding to such comments or request for hearing shall do so no later than January 14, 2005; and it is

**FURTHER ORDERED**, that this Order *Nisi* shall be effective January 21, 2005, unless PSNH fails to satisfy the publication obligation set forth above or the Commission provides otherwise in a supplemental order issued prior to the effective date.

By order of the Public Utilities Commission of New Hampshire this twenty-second day of December, 2004.

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Thomas B. Getz  
Chairman

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Graham J. Morrison  
Commissioner

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Michael D. Harrington  
Commissioner

Attested by:

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Michelle A. Caraway  
Assistant Executive Director