

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

PETITION OF PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE FOR LICENSES TO CONSTRUCT FIBER OPTIC CABLE AND TO MAINTAIN ELECTRIC LINES AND FIBER OPTIC CABLE OVER AND ACROSS PUBLIC WATERS AND/OR PUBLIC LANDS IN THE CITY OF KEENE AND THE TOWNS OF TROY AND SWANZEY, 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 licenses to construct fiber optic cable and to maintain electric lines and fiber optic cable at thirteen locations over and across public waters in the City of Keene and the Towns of Troy and Swanzey, New Hampshire, and at two locations over and across public lands owned by the State of New Hampshire in the Town of Troy and 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 had previously constructed, and currently maintains, an electric transmission line designated as line T-198. The T-198 line runs between PSNH’s Monadnock Substation in Troy, New Hampshire, and PSNH’s Emerald Street Substation in Keene, New Hampshire, and is an integral part of the PSNH transmission system and the overall New England transmission grid. The T-198, as presently constructed, crosses public water bodies at thirteen locations and/or railroad properties acquired and now owned by the State of New Hampshire (public lands) at two locations in the City of Keene and the Towns of Swanzey and Troy, New Hampshire. With the exception of the one existing crossing of the Ashuelot River in Swanzey, the overhead crossings of the T-198 at these locations have not been previously licensed by the Commission. All fifteen crossings are listed in Table 1 attached to this Petition<sup>1</sup>.

2. In order to continue to meet the reasonable requirements of service to the public, PSNH has determined that it is necessary to upgrade the reliability and capacity of the communications systems used in its electric system operations by the addition of fiber optic cable on the electric transmission line covered by these crossings. As part of a regional project referred to as the “Monadnock Region Upgrades,” the addition of the ADSS cable to the T198 Line will be required primarily to accommodate and protect the new Fitzwilliam

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<sup>1</sup> The majority of T-198 crossings of the Ashuelot River, its South Branch and the 2 state-acquired railroad properties were apparently not previously licensed due to either oversight or to the application of other crossing license criteria at the time of original construction. The installation of fiber optic cable at these locations, as well as existing electrical line crossings, will be licensed under this Petition. (All water crossings are under 20 acres, including the licensed crossing.)

Substation. Currently, the entire length of the T-198 line between Monadnock and Keene is constructed of 477kcmil 26/7 ACSR for the three phases and the two static wires are 7#8 Alumoweld wire. This project may be considered an interim measure that will protect the new Fitzwilliam Substation as a rebuild of the entire T-198 line is currently being studied as part of a western area upgrade. **As is more particularly set forth in paragraph 16 of this Petition below, there is an important need to have the ADSS cable in place and operationally in service by not later than October 17, 2008, and therefore PSNH is requesting expedited consideration of this Petition by the Commission.**

3. On each of these crossings, PSNH intends to install an under built, all dielectric self-supporting fiber optic cable, known as ADSS (All Dielectric Self Supported) cable, specifically, 24 fiber track resistant cable with a diameter of 0.643 inches. Each of the fiber optic cable crossings has been designed and will be constructed in accordance with the applicable standards and specifications of the 2007 National Electrical Safety Code (NESC) C2-2007. The ADSS cable meets the definition of the NESC of fiber-optic cable – supply which is a fiber located in the supply space of overhead or underground facilities as stated in the NESC definitions and Rule 230F1b. Based on Rule 230F1b, fiber optic supply cables that are entirely dielectric shall have the same clearance from communications facilities as required for a neutral conductor meeting Rule 230E1. The required technical information provided in this Petition is also based on the 2007 National Electrical Safety Code (C2-2007). Given that final engineering and construction may have a variance from the petitioned design, the ADSS cable will more than adequately meet the applicable standards, specifications and clearances of the 2007 National Electrical Safety Code.

4. The ADSS cable is to be installed on existing transmission structures by a support bracket below the existing phase conductors, and therefore results in a reduction in the existing clearance between the land and water as it is the lowest cable on this transmission line. Typical details of the type of structures used have been provided with and are attached to this Petition as FIGURE 1 (Typical 115 kV Tangent Structure, Type A & D), FIGURE 2 (Typical 115 kV Angle Structure, Type C), FIGURE 3 (Typical 115 kV Deadend Structure, Type DA) and FIGURE 4 (Typical 115 kV Tangent Structure, Type A3, D3 & RA). Construction dimensions are shown on these FIGURES. The existing overhead shield wire (static wire) is located above the existing phase conductors. Since it is located above the conductors, existing clearances between the land and water and the lowest phase conductor are maintained. Construction details are provided on FIGURES 1, 2, 3 and 4.

5. Surface water elevations for the crossings were based on information contained in the New Hampshire Geographically Referenced Analysis and Information Transfer System (NH GRANIT). NH GRANIT's data also references FEMA flood water data. Table 232-1, Note 18 of the NESC states that for uncontrolled water flow areas, the surface area shall be that enclosed by its annual high water mark. Clearances shall be based on the normal flood level. The elevation of the normal flood level was determined for PSNH at all crossings in a special study conducted by ENSR Environmental Consultants (ENSR) of Westford, Massachusetts. Normal flood level was determined by this study through direct observation of the geomorphic features of the stream channel, banks and floodplain. ENSR determined that the bank full flow that fills the channel to the top of bank is a conservative approximation

of the normal flood level of the Ashuelot and South Branch Ashuelot Rivers at the T-198 water crossings. Details of the ENSR study may be found in Appendix L attached to this Petition. In all cases presented in this application, the water surface clearance criteria fall in the less than 20 acres category.

6. Based on Table 232-1.7a 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 is 20.5 feet for waters less than 20 acres. NESC Rule 232.C.1.a states that an additional clearance of 1.6 feet or  $[\frac{((115 \text{ kV} \times 1.05/\sqrt{3}) - 22\text{kV}) \times .4\text{in}}{12}]$  is needed for 115 kV, which brings the total required minimum clearance to 22.1 feet. For under built ADSS fiber optic cable that meets NESC Rule 230F1b, which states the clearance for ADSS cable is the same as a neutral conductor meeting Rule 230E1, the minimum clearance to the water surface at the normal flood level is 17.5 feet for waters less than 20 acres. Based on Table 232-1.2 of the NESC for open supply conductors 750 V to 22 kV to ground, the minimum clearance to roads subject to truck traffic for 115 kV is 18.5 feet with the additional 1.6 feet of clearance for 115kV for a total required clearance of 20.1 feet. Based on Table 232-1.1 of the NESC for open supply conductors 750 V to 22 kV to ground, the minimum clearance to railroad track for 115 kV is 26.5 feet with the additional 1.6 feet of clearance for 115kV for a total required clearance of 28.1 feet. Based on Table 232-1.2 of the NESC for the under built ADSS cable, the minimum clearance to roads subject to truck traffic is 15.5 feet. Based on Table 232-1.1 of the NESC for the under built ADSS cable, the minimum clearance to railroad track is 23.5 feet.

7. A total of three phase wires and two static wires currently span each crossing and an ADSS cable will be installed. The phase conductor design tension is 4000 lbs at NESC Heavy. The static wire design tension is 3500 lbs at NESC Heavy. The ADSS cable will be designed for ½ inch radial ice, no wind, at 32 deg. F condition. The ADSS cable sag will be designed and installed to match the phase conductor sag at 60 degree F no wind condition. The ADSS design tension is 350 lbs at 60 deg F. Sag and tension charts will be provided for installation in the field. The ADSS stringing tension is based on clearances at the structure, which include 10 ft minimum ground clearance at 1.0 inch radial ice condition, 15.5 ft minimum vertical ground clearance at ½ inch radial ice. Minimum clearances over highways, railroad crossings, water bodies and other utilities are also considered and are provided for each crossing in Appendices A through K, inclusive, attached to this Petition.

8. The sags and clearances to the water surface and to the railroad track for each of the proposed crossings for the ADSS cable as well as the existing unlicensed conductors are also provided in the attached Appendices A through K.

9. The minimum required clearances above the water surface, roadways and railroad tracks are stipulated in NESC Rule 232 and tabulated in Table 232-1. The location, design and construction of the one existing licensed and 14 existing unlicensed phase wire crossings, and the fifteen new ADSS cable crossings, are shown on the drawings attached to and made a part of the attached Appendices A through K.

10. The installation methods to be used in the stringing of the fiber optic cable will avoid any impacts to any wetlands in the areas of the crossings, and therefore no wetland permits are required.

11. The T-198 line currently crosses two railroad corridors acquired by the State of New Hampshire, and administered by the New Hampshire Department of Transportation Bureau of Rail and Transit (NHDOT), one in Troy (structures 29-30) and one in Keene (structures 146-147). These crossings were previously permitted by license agreements with the previous owner, the B&M Railroad, and PSNH is now working with the NHDOT to permit these crossings at the same locations. NHDOT has issued PSNH a crossing agreement for the Troy crossing for the T-198, inclusive of the new ADSS cable installation; that agreement has been executed by PSNH, returned to NHDOT, and PSNH is awaiting execution and return from NHDOT. NHDOT has granted PSNH an easement for the Keene crossing for the T-198 line; NHDOT's Rail Planner has informed PSNH that installation of the ADSS cable on the T-198 line is a permissible installation pursuant to the easement without further NHDOT approval, and PSNH is in the process of obtaining written confirmation of this assurance. Copies of the NHDOT crossing agreement and the easement are attached hereto in Appendix M.

12. The proposed crossings have been designed and will be constructed, maintained and operated by PSNH in accordance with the applicable requirements of the NESC. While the project may appear to be in a "Special Wind Region" as referenced by the NESC Figure 250-2(e), physical GIS overlaying of the "Special Wind Region" onto a map of the project territory demonstrated that it is not.

13. With the exception of the Ashuelot River crossing at structures 151-152 (Exhibit K2) in Keene, PSNH owns permanent easements, not less than a minimum of 150 feet wide, for its lines and facilities on both sides of the public water bodies and public lands at all of the existing and proposed crossing locations. At structures 151-152, the easement width is 65 feet. Each of the existing and proposed crossings are located within the limits of these easements.

14. This project will not involve any changing out, or alteration of, pole structures. There will also be no increase in height/profile of existing structures. As such, Sue Dempsey, FAA Aeronautical Information Specialist – New England Region, has informed PSNH that a Notice of Proposed Construction and Alteration per Federal Aviation Regulation Part 77 is not required.

15. PSNH submits that the licenses petitioned for herein may be exercised without substantially affecting the rights of the public in the public waters or on the public lands, which are the subject of this Petition. Minimum safe line clearances above the river surfaces, affected shorelines and public lands will be maintained at all times and the use and enjoyment by the public of said public waters and lands will not be diminished in any material respect as a result of the overhead line and cable crossings.

16. PSNH respectfully requests that the Commission consider this Petition in an expedited manner, issue an Order Nisi in connection with this Petition by not later than one week from date of filing, and provide in said Order for the necessary publication and notices in a time frame that specifies not later than October 10, 2008, for said Order to become effective absent objection or request for a hearing. This request is necessitated by the acute need to have the ADSS cable installation which is the subject of this Petition operationally in service by not later than October 17, 2008. Specifically, it is necessary to have the ADSS cable in service in order to establish communications for the high speed protective systems required to energize and operate the new PSNH Fitzwilliam Substation, located in Fitzwilliam, New Hampshire. The Fitzwilliam Substation is a new 345/115 kV substation that is being interconnected to the PSNH 345 kV 379 line, which connects to the Vermont Yankee Nuclear Power Plant (VY). The 379 line outage needed to accomplish the interconnection has been carefully planned and coordinated with VY to minimize the impact on VY's operations. Without the communications which will be provided by the ADSS cable, the Bulk Power System would not be adequately protected, the PSNH Electric System Control Center (ESCC) would be deprived of any real time data from the Substation and would have no Supervisory Control and Data Acquisition (SCADA) for the Substation, and it would be necessary to continuously man the Substation with personnel until the necessary communication channels and protective systems can be installed. The technical engineering designs, plans, and calculations included in this Petition have been submitted for prior review and comment by the Commission's engineering consultant, Michael D. Cannata, Jr., P.E., of The Liberty Consulting Group, prior to the filing hereof, and should not require further consultation in order for the Commission to issue the requested Order Nisi.

Wherefore, PSNH respectfully requests that the Commission:

- a. Find that the licenses petitioned for herein may be exercised without substantially affecting the public rights in the public waters and lands which are the subject of this Petition;
- b. Grant PSNH a license to maintain the existing seven (7) 115kV electric transmission line crossings, that are not currently licensed, over and across the South Branch of the Ashuelot River in Troy and Swanzey, NH;
- c. Grant PSNH a license to maintain the existing five (5) 115kV electric transmission line crossings, that are not currently licensed, over and across the Ashuelot River in Swanzey and Keene, NH;
- d. Grant PSNH a license to maintain the existing two (2) 115kV electric transmission line crossings, that are not currently licensed, over and across public lands at the state acquired railroad properties in Troy and Keene, NH;
- e. Grant PSNH a license to construct and maintain fiber optic cable at the thirteen (13) transmission line crossings of public waters where twelve (12) are existing

unlicensed crossings in the City of Keene and the Towns of Swanzey and Troy, New Hampshire, specified in the Petition;

- f. Grant PSNH a license to construct and maintain fiber optic cable at the two(2) transmission line crossings of state acquired railroad properties in the Town of Troy and the City of Keene, New Hampshire, specified in the Petition;
- g. For convenience and record keeping clarity, re-license the crossing in NHPUC Order No. 22,973 (DE 98-100) and include an ADSS fiber optic cable crossing of the Ashuelot River in Swanzey, NH; and,
- h. Issue an Order Nisi and orders for its publication by not later than one week from the date of the filing of this Petition, and provide in said Order for the necessary publications and notices in a time frame that specifies not later than October 10, 2008 for said Order to become effective absent objection or request for a hearing.**

Dated at Manchester this 12<sup>th</sup> day of September, 2008.

Respectfully submitted,

PUBLIC SERVICE COMPANY OF NEW  
HAMPSHIRE

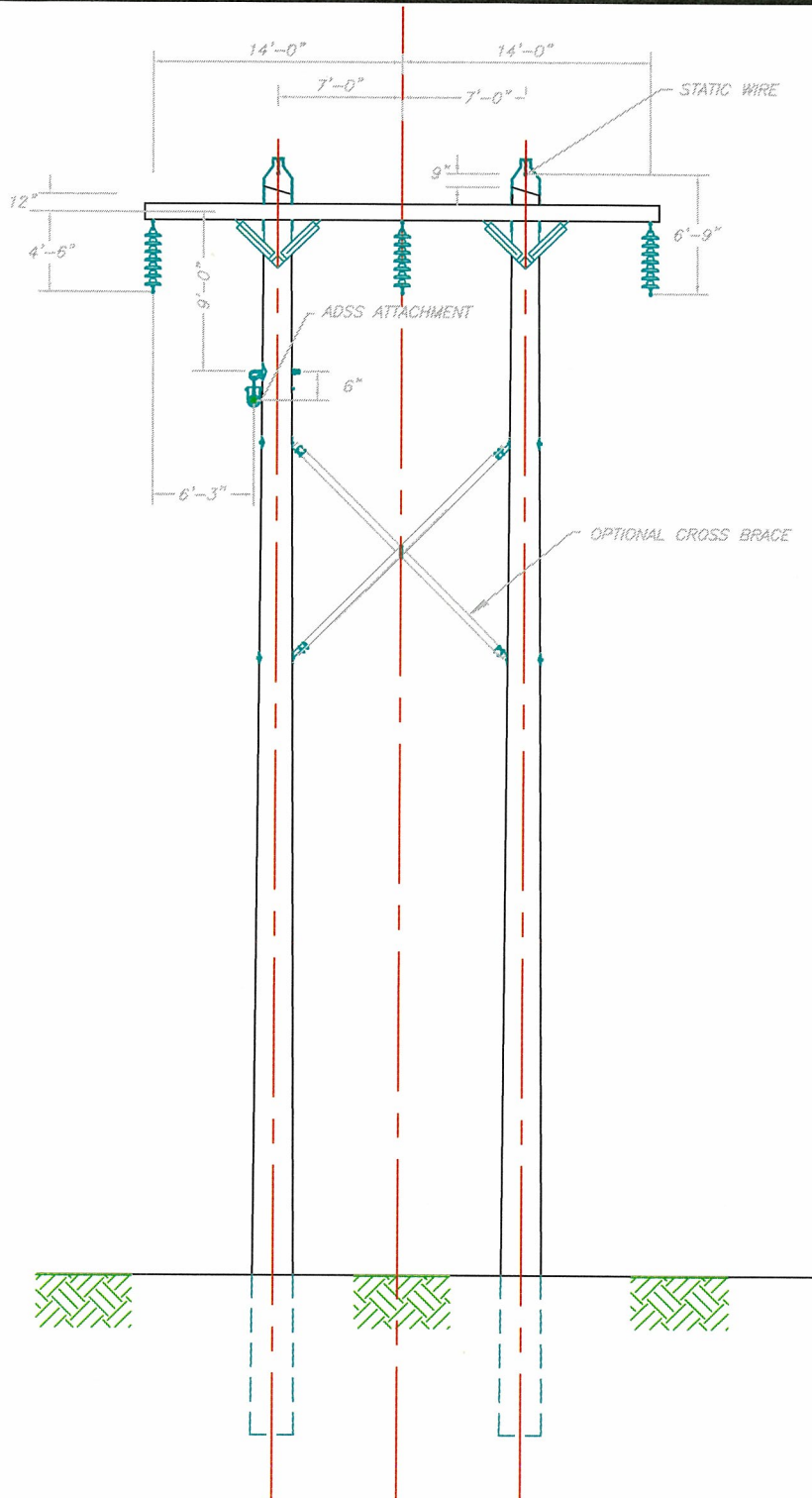
By Its Attorney



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Table 1  
Crossing Licenses for Existing T-198 Line

<b>Town</b>	<b>Water Body Or Public Land</b>	<b>NHPUC Order Number</b>	<b>NHPUC Docket No.</b>	<b>Pole Structures</b>	<b>Current Petition Appendix</b>
<b>Troy</b>					
	South Branch Ashuelot River State Acquired Railroad Property	Not Previously Licensed		29-30	A
<b>Swanzy</b>					
	South Branch Ashuelot River	Not Previously Licensed		71-72	B
	South Branch Ashuelot River	Not Previously Licensed		97-98	C
	South Branch Ashuelot River	Not Previously Licensed		99-100	D
	South Branch Ashuelot River	Not Previously Licensed		103-104	E
	South Branch Ashuelot River	Not Previously Licensed		105-106	F
	South Branch Ashuelot River	Not Previously Licensed		110-111	G
	Ashuelot River	Not Previously Licensed		121-122	H
	Ashuelot River	Not Previously Licensed		122-123 123-124	I
	Ashuelot River	21,873	DE 94-272	130-131	J
<b>Keene</b>					
	State Acquired Railroad Property Ashuelot River	Not Previously Licensed		146-147 150-151 151-152	K



1	MADE TYPICAL FIGURE	7/10/00	JPR	AD	GAO	DRAWN	Public Service of New Hampshire		Engineering Division	
						DESIGNED	TYPICAL 115 KV TANGENT STRUCTURE FIGURE 1 TYPE A & D			
						CHECKED				
						APPROVED				
							SCALE	DATE	SHEET	DRAWING NO.
							1"=10'	6/3/95	OF	D-10068-25 REV 1
NO.	REVISION	DATE	DRWN	CHK	APPR					







