


STATE OF NEW HAMPSHIRE

Inter-Department Communication

DATE: March 06, 2012

AT (OFFICE): NHPUC

FROM: Randy Knepper
Director of Safety 

SUBJECT: Review of PSNH Petition for Revision to an Existing Circuit K-165
Crossing of the Merrimack River, Merrimack and Litchfield, NH
Docket No. DE 11-257

TO: Debra Howland, Executive Director
Tom Frantz, Director, Electric Division
Steve Mullen, Assistant Director, Electric Division
Lynn Fabrizio, Staff Attorney

The Safety Division review of the above petition consisted of the following elements:

- Petition contents and history
- Applicable State statute
- Review of existing crossing(s) already licensed by the PUC
- Review of land ownership of existing pole structures.
- Review of NESC code requirements as described in Puc 300 rules
- Review of public need and public impact, including applicability of other State regulations
- Conclusions and Recommendations

1. Petition contents and history.

- On November 30, 2011, Public Service Company of New Hampshire (PSNH) filed a petition to alter an existing crossing of the Merrimack River in Merrimack and Litchfield, New Hampshire by altering the material, height, location of both support structures as well as increasing the conductor size and material, increasing the size and material of the static wire which serves as a shield wire and replacing the communication wire from an ADSS type to an OPGW line (84 fiber optic cable). The relocation of the existing support structures of an existing 115 kv transmission line (Circuit K-165 referred to as the "Busch Tap") on both sides of the Merrimack River allows for proper clearance from a newly proposed circuit H-123 (115 kV) that will be installed between Line 380 (345kV) and the relocated K-165 (115 kV) as well as accommodate alignment into a proposed substation (Eagle Substation) located in an adjacent northerly parcel in Merrimack.

- The new support structure (Structure 183) on the westerly side of the river (in Merrimack) will be a steel single pole structure replacing an existing wooden structure. The height will be increased from a 55 foot structure to a 110 foot structure. The location on the westerly side of the Merrimack River will be approximately 168.9 ft from the river bank whereas the existing location of the support structure is 133 feet from the river bank. In addition the support structure will be located approximately 50 foot southerly, will be placed on a concrete foundation and is of NESC Grade B type construction.
- The new support structure (Structure 184) on the easterly side of the river (in Litchfield) will be a laminated wooden H Frame structure replacing an existing wooden structure. The height will be increased from a 55 foot structure to a 115 foot structure. The location on the easterly side of the Merrimack River will be approximately 118 ft from the river bank whereas the existing location of the support structure is 113 feet from the river bank. In addition the support structure will be located approximately 50 foot southerly, will be directly embedded and is of NESC Grade B type construction.
- The span between the structures will be increased from 785 feet to approximately 856 feet while the Merrimack River span is increased from 539 feet to 569 feet.
- The single conductors for all 3 phase will be replaced from the existing 795 ACSR to 1590 ACSR (45/7 configuration) which will increase electrical capacity significantly.
- A single 19/#10 Alumoweld static wire will replace the existing 7#8 Alumoweld static wire which serves as a shielding wire for lightning strikes
- The position and type of communication carrier is being replaced from an ADSS type (All Dielectric Self Supporting) fiber optic to an overhead power ground wire (OPGW) fiber optic cable with 84 strands. The new communication cable (OPGW) will be overhead of the conductors for the crossing while the existing ADSS was below the existing conductors of K-165. The OPGW wire serves dual purposes as a static wire and communication cable.
- All water clearances are from the 10 year flood level that was derived by PSNH based on NAVD 88 datum and FEMA flood map #33011C0503D.
- On February 24, 2012, PSNH requested expedited status for this crossing because of a planned ISO New England coordinated shut down of the circuit to begin the reconstruction.
- On March 6, 2012 PSNH forwarded a copy of the U.S. Army Corps of Engineer permit NAE 2010 -2435 for K-165 issued on June 15, 2011 and a permit modification issued January 31 2012 that lowered the clearances required from the water to those based on the Nashua bridge that crosses the Merrimack River and not the recently completed Manchester bridge that serves as an entrance to Manchester Boston Regional Airport.

2. **New Hampshire statute referenced in petition.**

TITLE XXXIV
PUBLIC UTILITIES

CHAPTER 371
PROCEEDINGS TO ACQUIRE PROPERTY OR RIGHTS

Rights in Public Waters and Lands

371:17 Petition. – Whenever it is necessary, in order to meet the reasonable requirements of service to the public, that any public utility should construct a pipeline, cable, or conduit, or a line of poles or towers and wires and fixtures thereon, over, under or across any of the public waters of this state, or over, under or across any of the land owned by this state, it shall petition the commission for a license to construct and maintain the same. For the purposes of this section, "public waters" are defined to be all ponds of more than 10 acres, tidewater bodies, and such streams or portions thereof as the commission may prescribe. Every corporation and individual desiring to cross any public water or land for any purpose herein defined shall petition the commission for a license in the same manner prescribed for a public utility.

Source. 1921, 82:1. PL 244:8. RL 294:16. 1951, 203:48 par. 17. 1953, 52:1, eff. March 30, 1953.

3. **Review of existing license(s) and permissions previously granted by the PUC for Merrimack River Crossing in Merrimack, NH and ownership of lands.**

On November 28, 1969, the PUC issued Order No. 9829 granting a license to Public Service Company of New Hampshire to construct and maintain electric transmission lines over and across the Merrimack River in the Towns of Litchfield and Merrimack. This order was the result of a petition filed under Docket No. D-E5747 by PSNH.

On July 14, 1997, the PUC issued Order No. 22,660 granting a license to construct a communication cable across the Merrimack River attached to the existing structures listed in Order 9829. The communication cable was ADSS type (All Dielectric Self Supporting) fiber optic. The crossing of the Merrimack River was between Litchfield and Merrimack. This order was the result of a petition filed under DE 97-117 by PSNH that also involved four other river crossings over the Merrimack River.

This portion of the Merrimack River is considered a public river and is listed on the DES official list of public rivers and streams. See <http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/olpw.pdf>

This portion of the Merrimack River is considered navigable per the US Army Corp of Engineers. The Merrimack River south of Concord is designated navigable and is subject to aerial crossing provisions of Section 10 of the River and Harbors Act.

4. Review of land ownership of existing pole structures.

According to the Town of Merrimack's GIS database of parcels owned within the town, the western transmission support structure No. 183 is located on a parcel 3D-1-006 owned by PSNH and listed as Star Drive. The eastern transmission support structure No. 184 is located on a parcel in Litchfield within a 320 foot wide easement that PSNH has rights to. Both structures are being changed in respect to material, height and location.

5. Review of NESC code requirements as described in Puc 300.

N.H. Code of Administrative Rules PART Puc 306 requires each utility shall construct, install, operate and maintain its plant, structures and equipment and lines, as follows:

- (1) In accordance with good utility practice;
 - (2) After weighing all factors, including potential delay, cost and safety issues, in such a manner to best accommodate the public; and
 - (3) To prevent interference with other underground and above ground facilities, including facilities furnishing communications, gas, water, sewer or steam service.
- (b) For purposes of this section, "good utility practice" means in accordance with the standards established by:
- (1) The National Electrical Safety Code C2-2002...

PSNH in its petition states that the 2007 National Electrical Safety Code C2-2007 was used for compliance. The Safety Division reviewed the differences between the C2-2007 and C2-2002 edition for section 23 Clearances and found the differences were mainly additional clarity in the later edition, but no clearance values were adjusted that would have an impact on this crossing.

The K-165 crossing of the Merrimack River is subject to Section 10 of The Rivers and Harbors Act and requires a permit from the US Army Corp of Engineers. Thus the aerial crossing conditions are listed as part of a combined wetlands permit and aerial crossing permit issued for the Eagle Substation and Thornton Substation in Merrimack which this crossing is a subpart. PSNH exceeds the low clearance requirement as stated in the January 31 2012 permit modification by approximately 3.9 feet. A New Hampshire DES permit is also not required per Administrative Rule Wq 1406.04 (d) (7).

The Safety Division reviewed 18 supporting statements contained in the petition, the four statements in Appendix B, Figures 1 and 2, and Exhibits 1 and 2, and found them to be in conformance with the applicable sections of the NESC code C2-2002. Supporting statement #15 was supplemented with the language from the US Army Corp permit ensures navigable requirements are met. PSNH provided sufficient detail to verify that no potential safety hazards will result from the alteration of the river crossing under a multitude of appropriate design scenarios.

6. Review of public need and public impact.

PSNH states the crossing is an integral part of the PSNH transmission system and the overall New England transmission grid. PSNH further states the increased height and structure adjustment is to provide the proper alignment and connection for a proposed PSNH distribution substation (Thornton Substation) and adjacent transmission substation named the Eagle Substation to be constructed in Merrimack on the parcel owned by PSNH. According to PSNH, no environmental permits are required of the crossing pursuant to RSA 483-B, which establishes permitting requirements under the Comprehensive Shoreland Protection Act, and New Hampshire Department of Environmental Services (NHDES) Administrative Rule Env-Wq 1406.04(d)(7), which exempts *de minimis* construction, excavation and filling activities from permitting requirements such as the replacement of utility poles and guy wires using mechanized equipment, provided that appropriate siltation and erosion controls are used and all temporary impacts are restored. PSNH states that it will comply with NHDES rules in the installation of replacement structure 91. PSNH states “the proposed transmission lines will not substantially affect the rights of the public in the public water of the Merrimack River. Minimum safe line clearances above the water surface and affected shorelines will be maintained at all times. The use and enjoyment by the public of the Merrimack River will not be diminished in any material respect as a result of the overhead line and cable crossings.”

7. Recommendations and Conclusions.

The Safety Division recommends approval of PSNH’s petition to the Commission with the following conditions:

- a. The Commission should require that all future alterations that may impact the public to the crossing conform to the requirements of both the 2002 and 2007 editions of the NESC and be resubmitted to the Commission 60 days prior to the alteration.
- b. PSNH should be required to maintain and operate the crossings in conformance with the NESC or risk future revocation of the license.

Appendix A

Existing 345 kV Line 380 transmission crossing the Merrimack River in Merrimack/Litchfield. See Order 25199 dated Jan 7 2011 DE 10-322

Existing 34.5 kV PSNH 3020X crossing in same ROW as Line 380

SNH Structure #183 to place wooden support with steel (west side of river) and to be relocated

PSNH K165 electric transmission line (115 kV) to be relocated to add room for new H123 (115kV)



Figure 1. Closer View of Merrimack River Crossing (west side), Merrimack, NH. Note storage building is not on PSNH property and is just south of PSNH owned parcel (See Figure 3). A new substation will be built northerly of the parcel named Eagle Substation.

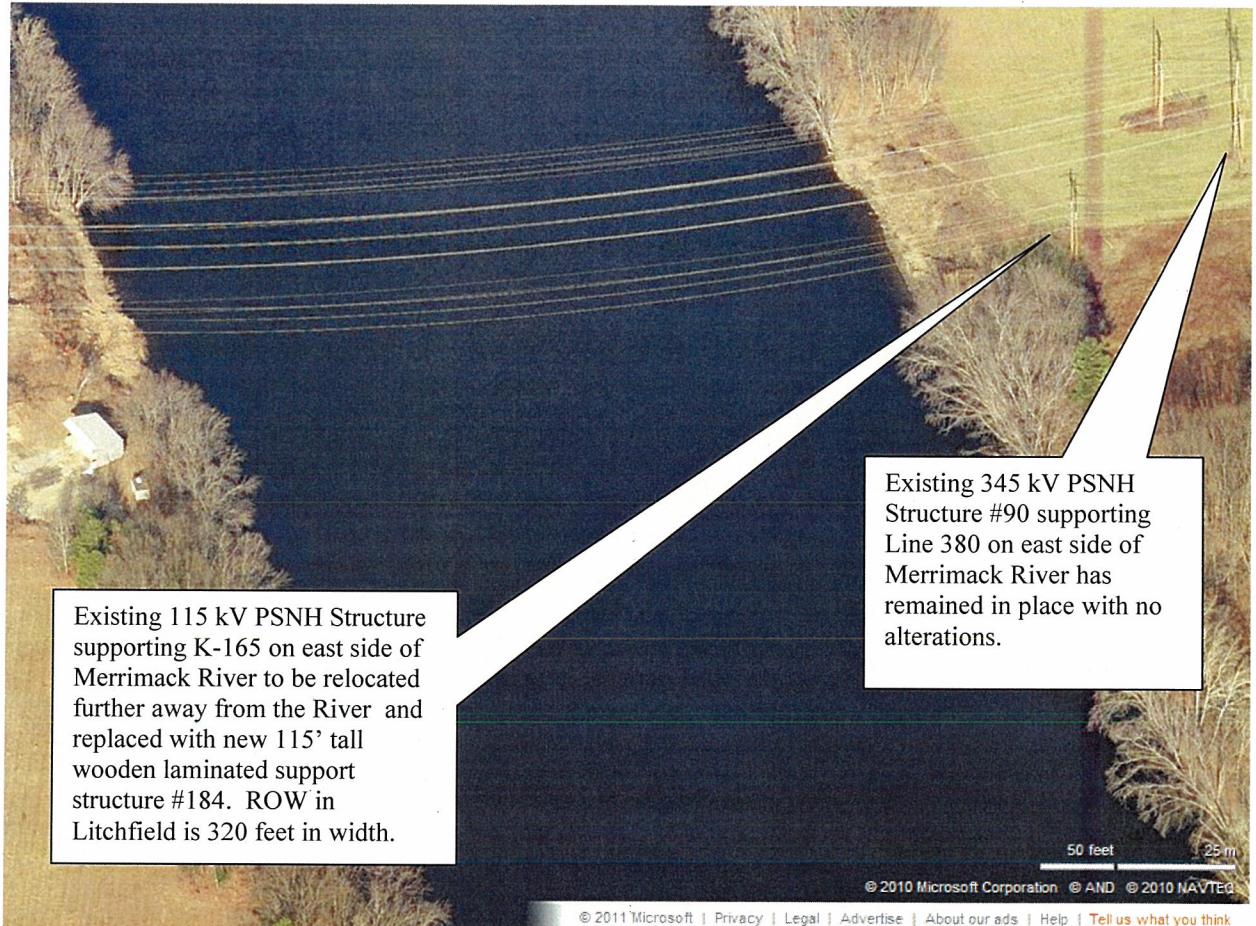


Figure 2. View of Merrimack River Crossing, Merrimack and Litchfield, NH. Note span for K165 is approximately 856 feet and river width is approximately 569 feet. 3 PSNH spans are shown for 3020X (34.5kV) – furthest north, Line 380 (345 kV) – middle, and Line K 165 (115kV) furthest south. The span for K 165 is being increased to 856 feet from a current span of 785 feet. The K165 circuit is being relocated further south to accommodate for a new span of a new circuit H 123 (115kv) to be installed between Line 380 and K 165. The relocated structure will be approximately 118 feet easterly from the embankment

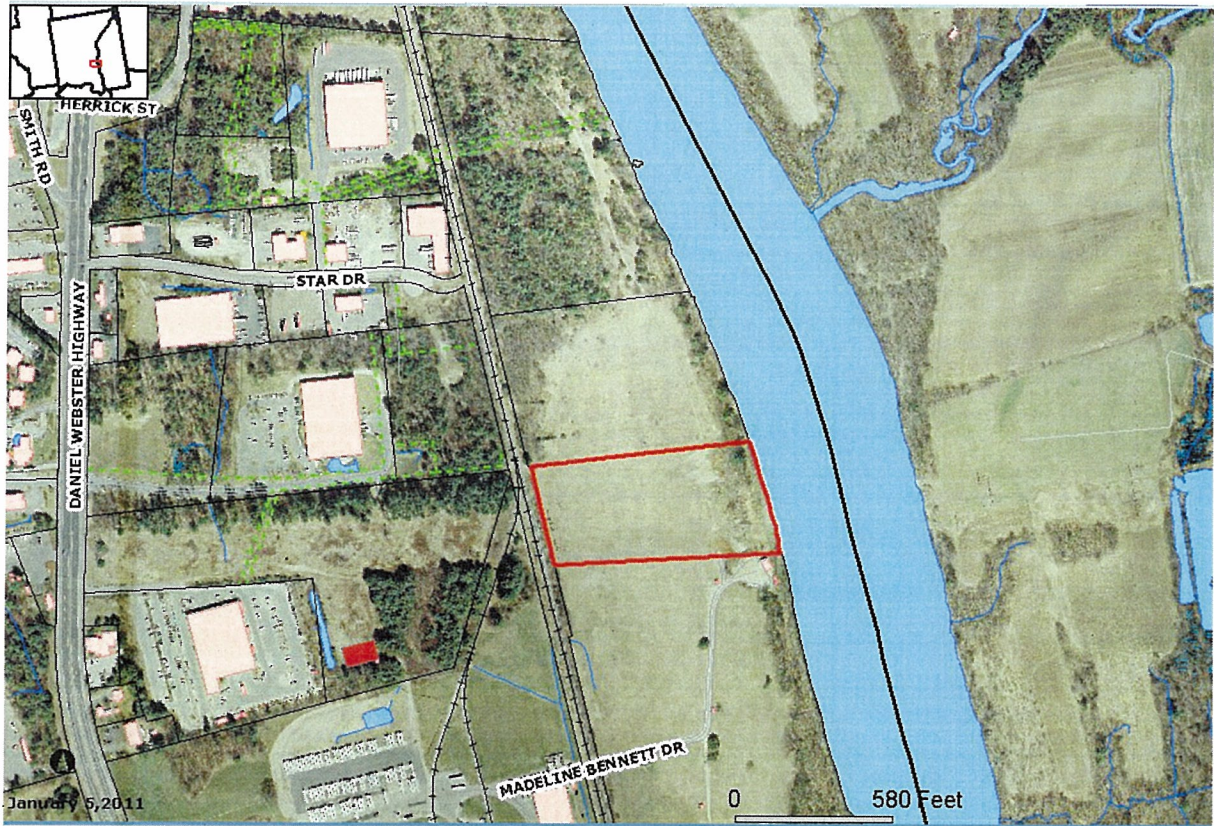


Figure 3. Parcel in Merrimack, NH between the Merrimack River and the Railroad in which Structure 183 of K-165 will be relocated. Information source is derived from on-line GIS database of the Town of Merrimack, NH.