

STATE OF NEW HAMPSHIRE

Inter-Department Communication

DATE: July 2, 2013

AT (OFFICE): NHPUC

FROM: Randy Knepper
Director of Safety



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SUBJECT: Review of PSNH Petition for an Existing Circuit Z177
Crossings of the Androscoggin River, Berlin at two locations
Docket No. DE 13-022, including proposed alteration of
communication wire

TO: Debra Howland, Executive Director
Tom Frantz, Director, Electric Division
Steve Mullen, Assistant Director, Electric Division
Suzann Amidon, 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 January 23, 2013, Public Service Company of New Hampshire (PSNH) filed a petition to alter two existing water crossings associated with the 115 kv circuit Z177. The water crossings are existing crossings of the Androscoggin River and the Androscoggin River spillway in Berlin which are east of the Smith Hydro generation dam in downtown Berlin.
- The first water crossing consists of two spans that are offset from each other that span the Androscoggin River directly east from the steel lattice tower at the Smith Hydro Station (depicted as Figure 1 in the PSNH petition). Span 1 consists of the existing 3#8 Copper weld static wires which serve as shield wires that are the highest attachments to the support structures as well as the three electrical conductors (226.8 kcmil ACSR) which make up the 115 kv

circuit identified as Z177. The material, height, location of both support structures adjacent to the water crossing as well as the conductor size and material, the size and material of the remaining static wire will remain as originally constructed. The overall purpose of the petition is to license this existing river crossing. Span 1 is approximately 189 feet and starts at the steel lattice tower at the Smith Hydro generating station and terminates at the 60 foot tall wooden pole dead end DA structure labeled as Structure 1.

- Span 2 of the same water crossing consists of 2-24 fiber optic wire cable that is of the type ADSS (all dielectric self-supporting). Span 2 is approximately 120 feet and starts at the turbine building itself at the Smith Hydro generating station and terminates at a 35 foot tall intermediate wooden stub pole labeled as communications structure #1. Communications structure is approximately offset to the north of Z177 circuit centerline by approximately 33 feet.
- The second water crossing is between the structures #1 and #2 of the same Androscoggin River in Berlin will remain at approximately 369 feet while the Androscoggin span is depicted as approximately 93 feet. Structures #1 and #2 consist of wooden poles approximately 60 feet above grade and 70 feet above grade respectively. This span consists of a proposed 2-24 OPGW static wires which serve as shield wires that are the highest attachments to the support structures as well as the three electrical conductors (226.8 kcmil ACSR) which make up the 115 kv circuit identified as Z177. The material, height, location of both support structures adjacent to the water crossing as well as the conductor size and material, the size and material of the remaining static wire will remain as originally constructed.
- The position and type of static wire is being replaced from a 3#8 Copper weld shielding wire to an overhead power ground wire (OPGW) fiber optic cable with 24 strands functioning as a communication carrier. The new communication cable (OPGW) will be overhead of the conductors for both crossings. The OPGW wire serves dual purposes as a static wire and communication cable
- The single conductors for all 3 phases of Z177 circuit will remain at each crossing as the existing 266.8 kcmil ACSR (6/7 configuration).
- The water clearances are conservatively taken from the 100 year flood level with an additional five foot buffer (margin of safety) that was derived by PSNH based on NAVD 88 datum and FEMA flood map and # 330029 0017 B for the Androscoggin River in Berlin, is considered sailable, and PSNH used a factor based on the difference from NGVD 29 datum to the NAVD 88 datum.
- PSNH requested a completed licensure for these crossings because of a planned reconstruction of the communication wire to begin in September 2013.

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 this location of the Androscoggin River in Berlin and ownership of lands.

There is no record that the Androscoggin River crossing in Berlin was ever issued a license by the PUC for circuit Z177. This petition completes the record of the 115 kv Androscoggin River crossings and allows PSNH to update licenses and conform to the existing statute.

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

These portions of the Androscoggin River are not considered navigable per the US Army Corp of Engineers. All vertical clearances easily exceed the minimum requirement for sailing for the Androscoggin River only.

4. Review of land ownership of existing pole structures.

Both crossings of the Androscoggin River are located within right of way and within limits of PSNH-owned land on both sides of the river. The

orientation, structures and distances from the edge of right of way will all remain as originally constructed.

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.

“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.

A New Hampshire DES permit is also not required per Administrative Rule Wq 1406.04 (d) (7). There will not be any alteration of terrain, thus no permit is required.

The Safety Division reviewed 16 supporting statements contained in the petition, the three statements in each of Appendices A, Figures 1,2 and 3, and Exhibits 1 and 2, and found them to be in conformance with the applicable sections of the NESC code C2-2002. It was noted by Staff that supporting statement 7 had a few labeling discrepancies but this was clarified and corrected with a telecommunication conversation between Staff and PSNH.

6. Review of public need and public impact.

PSNH states the transmission line crossings of Z177 are an integral part of the PSNH transmission system and the overall New England transmission grid. The additional fiber optic wires will provide a communication path between the Smith Hydro generating station and the Eastside Substation in Berlin which will allow for the necessary protection and control schemes of equipment at the Eastside Substation and improve the reliability of the Berlin area by minimizing exposure to electrical faults.

PSNH states “the proposed communication wires will not substantially affect the rights of the public in the public water of the Androscoggin 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 Androscoggin River will not be diminished in any material respect as a result of the overhead line and cable crossings."

The Safety Division concludes the impact to the public will be *de minimis* and not measurable.

7. Recommendations and Conclusions.

The Safety Division recommends full approval of PSNH's petition to the Commission without any conditions.

Appendix A

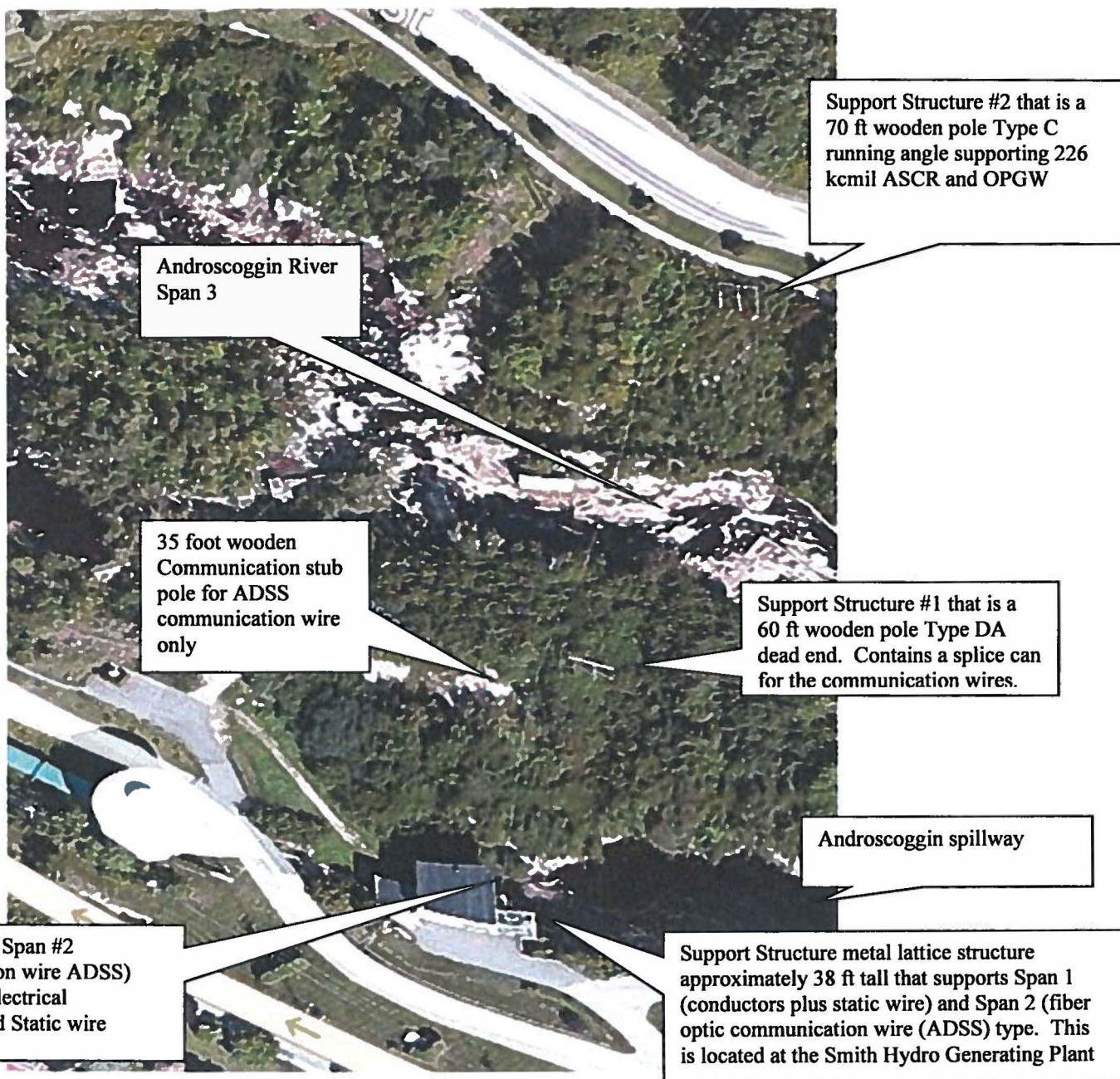


Figure 1: Smith Hydro Station in Berlin looking north with all the structures and spans shown. The other crossings of cables and electric lines are not part of the petition and not reviewed.

Androscoggin River crossing existing wires not part of petition (34.5 kv Circuit 3525)

Androscoggin River crossings previously unlicensed

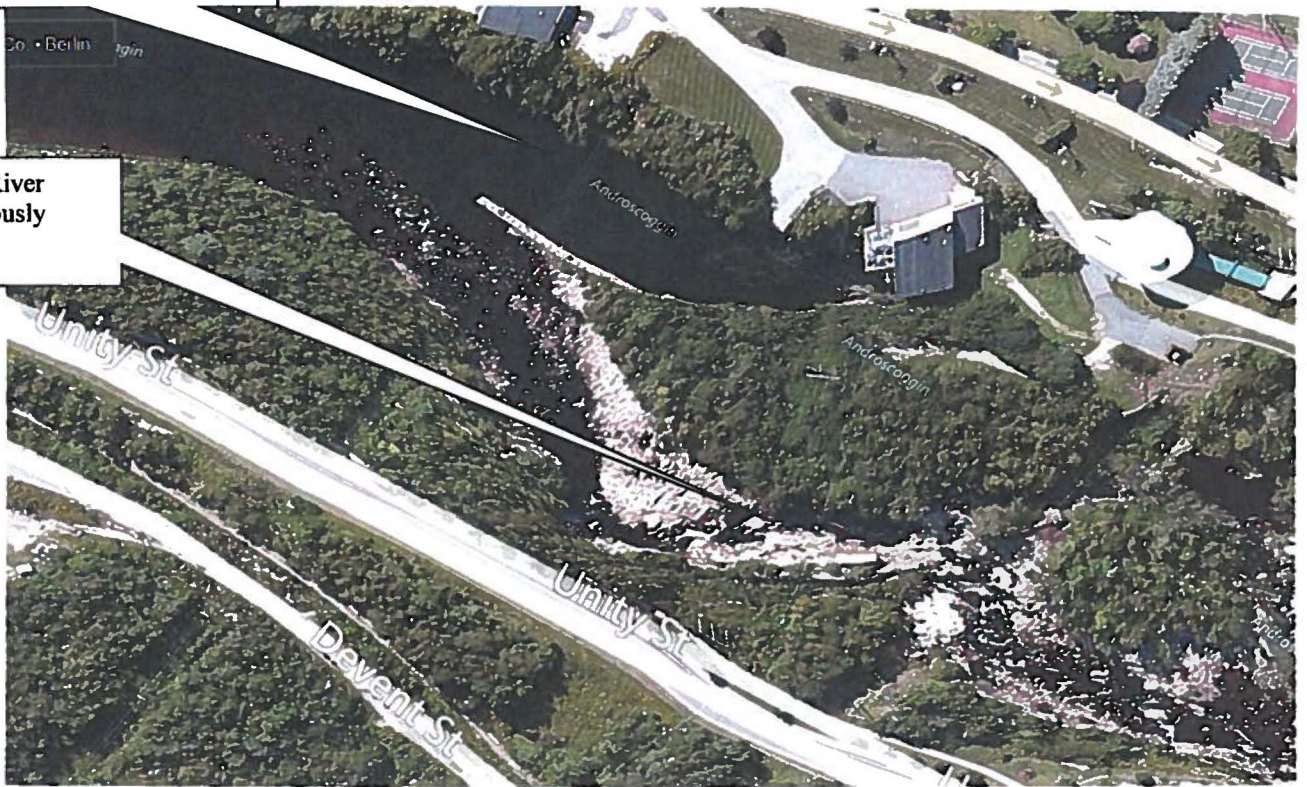


Figure 2 Androscoggin River, Berlin Crossing of 115 Kv Circuit Z177 looking southwesterly in the vicinity of Unity and Devent St. These circuits connect the Smith Hydro Generating Station with the Berlin East Side Substation.