STATE OF NEW HAMPSHIRE

Inter-Department Communication

DATE: 16 September 2010
AT (OFFICE): NHPUC

TF

FROM: Tom Frantz – Director, Electric Division

SUBJECT: DE 10-201: Petition by PSNH for a License to Construct and Maintain Electric Lines over and across the North Branch River in the Town of Antrim

TO: Chairman Getz, Commissioners Below and Ignatius
Executive Director Howland

On July 29, 2010, Public Service Company of New Hampshire (PSNH) filed a petition with the Commission under RSA 371:17 for a license to construct and maintain electric lines over and across the North Branch River in Antrim, New Hampshire. PSNH states in its petition that the crossing is required to accommodate the replacement of the Old North Branch Road bridge under State project No. 14944 and Federal Project Number X-A000(927).

PSNH currently operates and maintains a three-phase 7.2 kV distribution line known as the 3140 circuit in Antrim which crosses over the North Branch River and the existing bridge deck that will be replaced. PSNH needs to relocate the existing 3140 circuit for the new bridge construction. The new location of the line will be shifted on the north side of the North Branch River, but will not be changed in any significant way on the south side.

Staff employed the Accion Group Inc.(Accion) to review PSNH's petition. Accion filed an electronic memo of its review of PSNH's petition with Staff on August 2. Accion stated that "...PSNH has provided sufficient information and data to justify construction of new electric lines across public waters at this location" and that "...PSNH assures the Commission that the new overhead facilities will be properly constructed, operated, and maintained in accordance with the requirements of the NESC, ANSI C2-2007." Accion also stated that "...if the proposed facilities are constructed, operated, and maintained as proposed in its filing, PSNH will provide safe and reliable service to the public based on sound engineering standards and that construction will be in accordance with the 2007 edition of the National Electrical Safety Code." Accion further recommended to Staff that it recommend approval of PSNH's petition.

Based on the recommendation of Accion and Staff's review of the filing, Staff recommends that the Commission grant PSNH a license to construct and maintain the electric lines over across the North Branch River in Antrim. I have attached Accion's report to this memo.

Please contact me if you have any questions or would like to discuss this matter.

Docket Number DE 10-201

Accion Review of the Public Service Company of New Hampshire Petition to Cross Public Waters of the North Branch River in Antrim, New Hampshire

August 2, 2010

Review Summary

On July 29, 2010, Public Service Company of New Hampshire (PSNH) filed a petition with the Commission pursuant to RSA 371:17 for a license to construct and maintain electric lines across the North Branch River in Antrim, New Hampshire. PSNH states that the rebuild of the existing 3140 7.2kV crossing is required to accommodate reconstruction of the under lying Old North Branch Road bridge by the New Hampshire Department of Transportation (NHDOT), State Bridge Project #130/149 (Federal Project Number X-A000(927)), and that the reasonable requirement of service to the public in the area cannot be met without the facilities replaced. The line was not previously licensed for a public water crossing as it is directly above the existing bridge deck. Funding of the bridge replacement is being provided under the American Recovery and Reinvestment Act and the project has a very tight construction schedule.

In support of its petition, PSNH submitted related exhibits as follows: a location plan depicting the geographic location of the proposed crossing (Exhibit 1); a plan and profile drawing depicting the location and projected elevations of the proposed crossing (Exhibit 2); and a construction detail drawing (Northeast Utilities Construction Standard DTR 10.211) depicting the construction specifications of the proposed structures (Exhibit 3).

PSNH states that the new 3140 7.2kV crossing will have an alignment similar to the existing unlicensed crossing and remain mostly within the public street right-of-way. The southerly side of the crossing will remain essentially in the same location and the northerly side of the crossing will be relocated approximately 50 feet to the northeast. PSNH further states that it has obtained a pole licence for the proposed southerly structure (Antrim #13450) and has obtained an easement from the Town of Antrim which owns the property in fee outside of the public street right-of-way at the northerly location. Additionally, PSNH states that no New Hampshire Department of Environmental Services or NHDOT permits are necessary for the construction of this crossing.

As designed by PSNH, the proposed crossing will consist of single class 2 wood pole tangent and small angle structures on each side of the North Branch River with a span of 115 feet between them. The new structure on the north side of the river will consist of a 45 foot pole with a 10 foot cross arm and is designated as structure #3. The phase conductors will be spaced horizontally 4.5 feet and 5.0 feet apart on the cross arm. The neutral conductor will be mounted to the pole 6 foot 10 inches below the conductor on the pole. The structure on the south side of the river will be similarly constructed with a 40 foot pole and is designated as structure #4.

The three phase conductors will be #2 ACSR conductors with 6/1 stranding, tensioned to a maximum of 1,395 pounds, and sagged to National Electrical Safety Code (NESC), American

National Standards Institute (ANSI) C2-2007 Heavy Load Conditions (0 degrees F, 4 pounds per square foot wind loading, and ½ inch radial ice). The neutral conductor will be also be #2 ACSR with a 6/1 stranding, tensioned to a maximum of 1,395 pounds, and sagged to NESC Heavy Load Conditions.

PSNH determined that the 100-year flood level at this location of the North Branch River is 880 feet using the elevations contained in the Flood Insurance Rate Map, Hillsboro County, Panel 128 of 701, Map Number 33011C0128D with an effective date of September 29, 2009 issued by the Federal Emergency Management Agency and are based on the National Geodetic Vertical Datum of 1929. PSNH stated that it used the 100-year flood for water elevations in its design instead of the normal flood level or 10-year flood level required by the NESC for the purpose of conservatism.

PSNH calculated the surface area of the crossing according to Note 19 to Table 232-1 of the NESC and found that the surface area was 65+/- acres. For crossing of waters suitable for sailing of over 20 to 200 acres, NESC Table 232-1.7.b requires a water surface clearance of 28.5 feet for phase conductors and 25.5 feet for neutral conductors that meet Rule 230C1. NESC Table 232-1.2 also requires that the clearance to the land surface or traveled way be 18.5 feet for phase conductors and 15.5 feet for neutral conductors that meet Rule 230C1.

PSNH investigated a multitude of weather and loading conditions for its design. The conditions investigated include ANSI C2-2007 Heavy Load Conditions, minus 20 degrees F ambient temperature for the phase and neutral conductors, 120 degrees F ambient temperature for the neutral conductor and 212 degrees F for the phase conductors. PSNH used these design conditions and combinations thereof to determine the minimum clearance of the conductors to the water, land surfaces, traveled way, and between the phase and neutral conductors.

As designed by PSNH, the maximum sag of the phase conductors would occur when the phase conductors are at 212 degrees F. At this condition, PSNH calculates that at minimum clearance, the phase conductors would remain 42.1 feet above the 100-year flood level of 880 feet, 30.4 feet above the land on the south side of the river, and 30.1 feet above the traveled way of the bridge. PSNH calculates that the maximum sag of the neutral conductor occurs when it is at NESC Heavy Load Conditions. At these conditions, PSNH calculates that at minimum clearance, the neutral conductor would remain 36.0 feet above the 100-year flood level of 880 feet, 26.7 feet above the land on the south side of the river, and 24.0 feet above the traveled way of the bridge. In addition, the minimum distance requirement between the phase conductors and the neutral conductor according to NESC Table 235-6-2a is 12 inches (1.0 feet). PSNH calculates that the minimum distance between the phase and neutral conductors is 5.0 feet when the phase conductors are at ANSI Heavy Load Conditions and the neutral conductor is at minus 20 degrees F without ice. As designed, all clearances exceed NESC requirements.

PSNH states 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 electric line crossing. PSNH further attests that the construction of the crossing will be constructed, maintained, and operated in accordance with the requirements of the NESC, ANSI C2-2007.

Conclusions and Recommendations

Accion reviewed the petition and associated technical information filed by PSNH in support of its petition.

Accion found that PSNH has provided sufficient information and data to justify construction of new electric lines across public waters at this location.

Accion found that PSNH assures the Commission that the new overhead facilities will be properly constructed, operated, and maintained in accordance with the requirements of the NESC, ANSI C2-2007.

Accion concluded that if the proposed facilities are constructed, operated, and maintained as proposed in its filing, PSNH will provide safe and reliable service to the public based on sound engineering standards and that construction will be in accordance with the 2007 edition of the National Electrical Safety Code.

Accion recommends that Staff recommend approval of PSNH's petition to the Commission.