THE STATE OF NEW HAMPSHIRE
BEFORE THE
PUBLIC UTILITIES COMMISSION

DE 10-223

REVISED PETITION OF NEW ENGLAND POWER COMPANY D/B/A NATIONAL GRID FOR LICENSE TO CONSTRUCT AND/OR MAINTAIN ELECTRIC LINES OVER AND ACROSS PUBLIC WATERS IN THE TOWN OF WALPOLE, NEW HAMPSHIRE

TO THE PUBLIC UTILITIES COMMISSION:

New England Power Company d/b/a National Grid ("National Grid"), a public utility engaged in the transmission of electricity in the State of New Hampshire, hereby petitions the Public Utilities Commission ("Commission" and/or "PUC"), pursuant to RSA 371:17, for a license to construct and maintain electric lines over and across the public waters of the Connecticut River in the Town of Walpole, New Hampshire. In support of its petition, National Grid states as follows:

1. In order to meet the reasonable requirements of service to the public, National Grid operates and maintains the J-136N 115kV transmission line between Flagg Pond Substation in Fitchburg, Massachusetts and Bellows Falls Substation No. 14 in Rockingham, Vermont. The J-136N line was constructed in 1927. The line crosses the Connecticut River between the Bridge Street crossing to the north and the discharge from the Bellows Falls Hydroelectric Station to the south. This area of the Connecticut River only receives flow during high flow periods because the water is diverted through the generation station on a daily basis.[1] The exact location of the

[1] After crossing the Connecticut River, the J-136N line shares the same double circuit towers with the I-135N line for a distance of approximately 52 miles. The I-135N line was reconductored during 2009. The I-135N crossing of the Connecticut River was licensed by the PUC pursuant to Order Nisi No. 24,956 in Docket DE 08-003, issued on April 8, 2009.

crossing is shown on plans which are attached to Appendix A.

2. Construction and maintenance of what is now known as the J-136N line was approved by the then New Hampshire Public Service Commission ("PSC") in Order No. 2,471 dated October 6, 1932. The J-136N crossing of the Connecticut River has not been previously licensed by the Commission.

3. To ensure the safety and reliability of National Grid's electric transmission system in southwestern New Hampshire, National Grid proposes to reconductor one mile of the J-136N line. This J-136N reconductoring is a high priority project because National Grid believes that increased loading conditions associated with winter weather could cause the J-136N composite conductor across the Connecticut River to fail. Given the degraded condition of that portion of the I-135N composite conductor which spans the Connecticut River as observed during its reconductoring and the similarity of conductor type, age, location and tensioning conditions for the J-136N conductor spanning the Connecticut River, National Grid determined that the J-136N conductor needs to be replaced. In short, if the I-135N conductor crossing the Connecticut River was degraded, the J-136N is expected to be degraded as well, since they are essentially the same.

National Grid seeks to take advantage of an outage opportunity commencing on November 1, 2010 to replace the composite conductor in the area of the J-136N Connecticut River crossing.

4. The J-136N line consists of composite conductor (core 7 strand red brass, outer layer 12 strand HD copper) between the Bellows Falls Substation to Structure 1B and 4/0 copper phase conductor between Structure 1B to Structure 6. A 7/16" HS

galvanized steel shieldwire exists along the full length of the reconductoring from the Bellows Falls Substation to Structure 6. The J-136N line is supported by double circuit galvanized lattice steel towers with grillage foundations, and a few single circuit lattice steel towers. Each lattice tower has been analyzed for structural adequacy based on individual wind and weight span, and National Grid's Standard Loading Conditions. As required by the National Electrical Safety Code (NESC), the Special Wind Region along the Connecticut River in New Hampshire was considered, and was found not to be a factor. The analysis shows that the lattice towers can be reinforced and reused.

5. The affected portion of the J-136N line will be reconductored with 795 kcmil ACSR, 26/7, "Drake" phase conductors at a rating of 140°C. One of the two 7/16" HS galvanized steel shieldwires (the one on the J-136N line side) will be replaced with a new 3/8" extra high strength galvanized steel shieldwire. Although only the composite conductor between the Bellows Falls substation and Tower 1B is believed to require reconductoring due to its degraded condition, a lack of accessibility and terrain conditions around Tower 1B prohibit installation of a pulling station and wire set up. Therefore, the J-136N line is proposed to be reconductored between the substation and a more suitable location at Tower 6, a total distance of one mile.

6. Based on the research and field inspection of its consulting engineer, Vanderweil Engineers, it has been determined that the Connecticut River crossing is not suitable for sailboating. See NESC, Table 232-1. See Docket DE 08-003.

7. National Grid only needs the license petitioned for in this proceeding in order to commence the reconductoring over the Connecticut River crossing.

8. National Grid owns permanent easements for its lines and facilities on both sides of the Connecticut River at the proposed crossing location. The proposed work will be conducted within the scope of these easements.

9. The specific technical information necessary to evaluate the J-136N Connecticut River crossing is contained in Appendix A.

10. National Grid submits that the license petitioned for herein may be exercised without substantially affecting the rights of the public in the public waters of the Connecticut River. Minimum safe line clearances above the surface of the river and affected shorelines will be maintained at all times. The use and enjoyment by the public of the Connecticut River will not be diminished in any material respect as a result of the overhead line crossings. In fact, the J-136N line has been in service in the same location for over 80 years, and has not diminished in any material respect the use and enjoyment of the river by the public.

WHEREFORE, National Grid respectfully requests that the Commission:

A. Find that the license petitioned for herein may be exercised without substantially affecting the public rights in the public waters which are the subject of this petition;

B. Grant National Grid a license to construct and maintain the J-136N electric transmission line over and across the public waters of the Connecticut River in Walpole, New Hampshire, as specified in the petition;

C. Issue an Order Nisi and orders for its publication; and

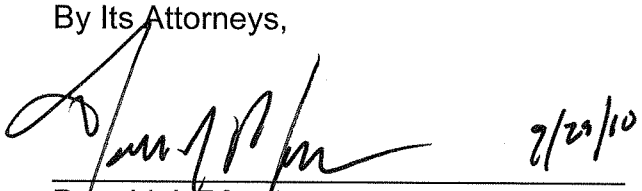
D. Grant such other relief as is just and proper.

Dated at Concord this 29th day of September, 2010.

Respectfully submitted,

NEW ENGLAND POWER COMPANY
d/b/a NATIONAL GRID

By Its Attorneys,



Donald J. Pfundstein
Erik R. Newman
Gallagher, Callahan & Gartrell, P.C.
214 North Main Street
P.O. Box 1415
Concord, NH 03302-1415
(603) 545-3600

Appendix A
J-136N — Connecticut River, Walpole, NH

1. As currently constructed, this line crosses over the Connecticut River in a cross country location approximately 1,500 feet south of the Bridge Street Crossing of the Connecticut River. The location of the existing crossing of the Connecticut River and the proposed construction is shown on attached location map, marked as Exhibit 1-1.

2. In order to accommodate the reconductoring, the existing composite conductor (core 7 strand red brass, outer layer 12 strand HD copper) in the crossing location of the J136N Line, a 115 kV circuit, will be replaced with new 795 kcmil ACSR 26/7 "Drake" conductor, and the existing 7/16 inch high strength galvanized steel shieldwire will be replaced with a 3/8" EHS galvanized steel new shieldwire. The existing steel lattice tower will be reused.

3. The design and proposed construction of the crossing is shown on the attached New England Power Company Plan and Profile Drawing entitled "Plan Showing Location of J136N Transmission Line Over and Across Connecticut River, Walpole, New Hampshire", marked as Exhibit 1-1.

4. The required technical information provided in this petition is based on the 2007 National Electrical Safety Code (NESC) C2-2007. The proposed crossing will be maintained and operated in accordance with the NESC.

5. The proposed crossing occurs between two existing lattice towers, located approximately 2,093 feet apart. The tower on the north side of the Connecticut River is the 69-foot high terminal bridge structure located inside the Bellows Falls Substation. The tower on the south side of the river, Tower 1B, is a 54-foot high deadend structure, Type §N-48.

   The new phase conductor and the new shieldwire will be located at the same elevation on the towers, and will have similar sags and clearances over the river as the existing composite conductor between the Bellows Falls Substation and Structure 1B.

   Both the phase conductor and the shieldwire will be sagged to NESC Heavy Loading condition (0°F, 4 pounds wind, 1/2" radial ice) maximum tensions of 8,800 pounds and 4,900 pounds respectively.

6. The 10 year flood elevation for the Connecticut River was based on the FEMA 10 year flood profile elevation from the Flood Insurance Study for Cheshire County. The 10-year flood elevation for this location is approximately 252.3 feet based on the National Geodetic Vertical Datum of 1929 (NGVD 29).

   Panel 14 of 610
   Map Number: 33005C0014E
   Effective Date: May 23, 2006

7. The nature of the water surface underneath the conductor and shieldwire crossing the Connecticut River is not suitable for sailboating. See Site Review of the Connecticut River Crossing, the Cold River Crossing, and the Ashuelot River Crossing; Identification of Clearance Issues, Dated September, 2008, Prepared by Vanderweil Engineers.

   The applicable vertical clearance is found in NESC Table 232-1, Row 6.

8. Using the above design criteria, and the maximum sags of the phase wire and the shieldwire, the minimum clearance for the crossing have been determined and designed as follows:

Condition	Maximum Sag under this condition	Minimum clearance to Land	Minimum clearance to the 10-year flood
	Feet	Feet	Feet
A. NESC Heavy, Phase Wires	157.61	26.3	28.9
B. Minus 20° F, Phase Wires	153.00	26.1	33.5
C. 105° F, Phase Wires	157.37	24.6	29.1
D. 284° F, Phase Wires	163.07	24.5	23.4
E. NESC Heavy, Shieldwire	137.92	37.5	50.4
F. Minus 20° F, Shieldwire	129.32	37.5	59.0
G. 105° F, Shieldwire	134.15	37.3	54.2

9. Minimum Clearance. Phase Wire
Maximum Operating Condition at 284 ° F (Item D above) results in minimum clearance
Minimum Clearance to land under those conditions is 24.5 feet, next to Structure 1B
- Required minimum clearance to land based on NESC Table 232-1.2 is 20.1 feet

Minimum Clearance to the 10-year flood water level under those conditions is 23.4 feet
- Required minimum clearance to water surface based on NESC Table 232-1.6 is 18.6 feet

The crossing clearances as proposed exceeds the NESC Requirements

10. Minimum Clearance, Shieldwire
Maximum Temperature Condition at 105° F (Item G above) results in minimum clearance to land and NESC Heavy Condition (Item E above) results in minimum clearance to the 10-year flood level.
Minimum Clearance to land under those conditions is 37.3, next to Structure 1B
- Required minimum clearance to land based on NESC Table 232-1.2 is 15.5 feet

Minimum Clearance to the 10-year flood water level is 50.4 feet
- Required minimum clearance to water surface based on NESC Table 232-1.6 is 14.0 feet

The crossing clearances as proposed exceeds the NESC Requirements

11. Minimum Shieldwire to Phase Wire Clearance

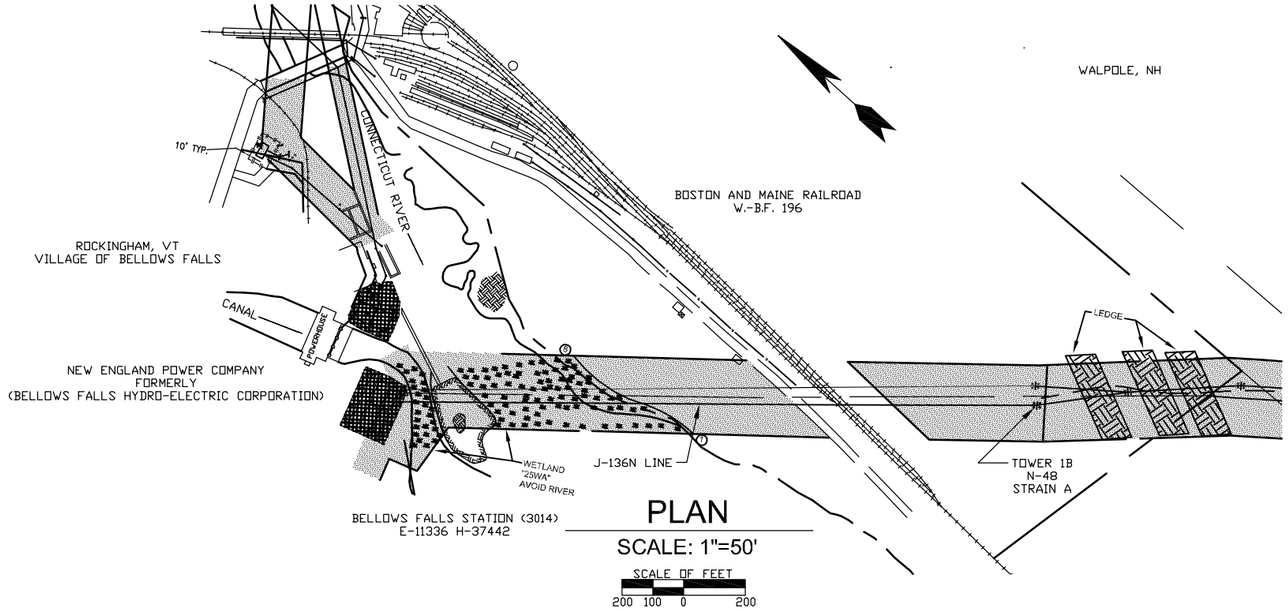
	Shieldwire Sag, feet	Conductor Sag, feet	Minimum separation between shieldwire and conductor
1	30 F, ½" ice - 135.9	30 °F, Bare - 154.9	10.1 feet, next to Structure lB
2	NESC Heavy - 137.9	NESC Heavy - 157.6	9.7 feet, next to Structure lB
3	30 °F, 3/4" ice, 4 psf wind - 136.9	30 °F, Bare - 154.9	8.8 feet, next to Structure lB

The minimum separations are based on the output of PLS-CADD, which searched for the Minimum distance between the shieldwire and conductor along the entire span for conditions 1, 2, and 3.
Condition 3 results in the minimum clearance between these wires

Minimum Clearance shieldwire to phase under these three conditions is 8.8 feet

- Required minimum clearance shieldwire to phase based on NESC Table 235-6, Section 2 is 4.8 feet

The shieldwire to phase wire clearances as proposed exceeds the NESC Requirement.

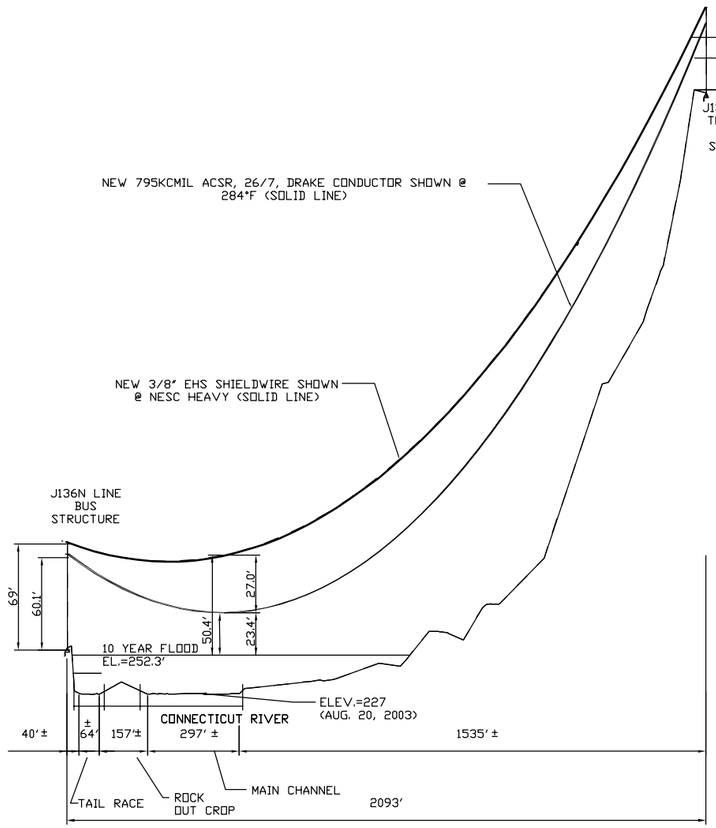


PLAN

SCALE: 1"=50'

SCALE OF FEET

200 100 0 200



PROFILE

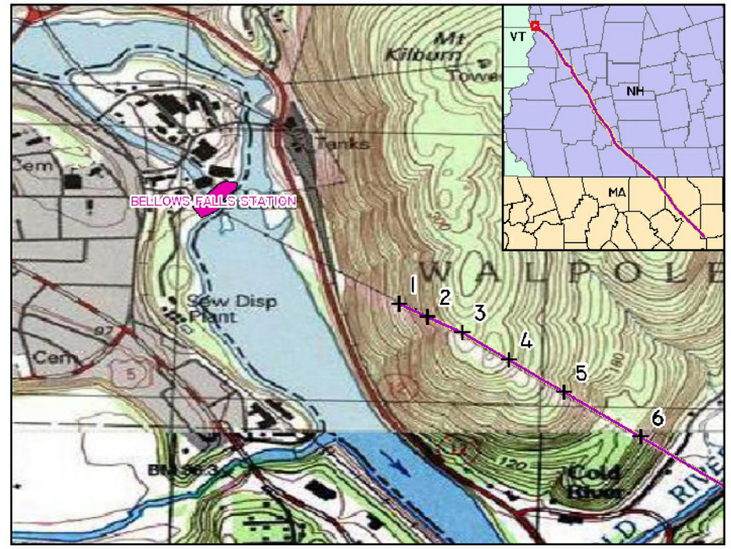
HORIZONTAL:1"=500'

VERTICAL:1"=100'

PHOTO

RAPIDS UNDER J136N & I135N MARCH 12. 2008 (August 20, 2003) = Date Flown

BELOW BELLOWS FALLS



KEY MAP

MAP SOURCE - USGS TOPOGRAPHIC IMAGE

SCALE - 1:24,000

0 0.125 0.25 0.5 0.75 | MILES

LEGEND

Tower Location

Existing Conductor to be Replaced

EXHIBIT 1-1

New England Power Company
Plan Showing Location of
J-136N Transmission Line
Over and Across
Connecticut River
Walpole, New Hampshire

Scale: As Shown Date: August 2010

REV	DATE	REVISION DESCRIPTION	DRWN	CHKD	APPVD
1	10/28/08	EDIT TO YEAR FLOOD DESCRIPTION			

ORIGINAL

INCHES ON ORIGINAL

nationalgrid

	NAME	DATE
ORIGINAL DRAWN BY	KMK	8/17/10
CHKD BY		
INSPTD BY		
APPRV BY		

115KV LINE
LINE CROSSING OF CONNECTICUT RIVER
IN WALPOLE, NH
PLAN & PROFILE
SCALE : AS NOTED

INCHES ON ORIGINAL