

In Re: Petition of New England Power Company  
d/b/a National Grid for Licenses to Construct and  
Maintain Electric Lines Over and Across Public  
Waters in the Towns of Walpole and Surry,  
New Hampshire

## **EXHIBIT C**

### **I-135N COLD RIVER CROSSING**

#### **1. Statement of Need**

In order to improve the reliability of NEP's electric transmission system in southwestern New Hampshire, NEP proposes to reductor the approximately 80 year old I-135N line. The I-135N reductoring is a high priority project because it eliminates low voltage and thermal capacity limitations identified in the ISO-NE Regional System Plan. Presently, a low voltage situation occurs as the result of a double circuit tower outage on the I-135S and J-136S lines on the system between the Flagg Road Substation and Pratts Junction. Currently, the low voltage problem is managed by load shedding. Voltage and thermal issues can also develop as the result of the loss of Vermont Yankee 345/115kV transformer, the 115kV K-186 line or the 355kV 340 line. At this time, the J-136N line will continue to be operated as currently configured.

#### **2. National Electric Safety Code**

NEP's engineers have designed the crossing to be in compliance with the 2007 Edition of the National Electrical Safety Code, (NESC) C2-2007.

#### **3. Specific Electrical and Physical Description**

Voltage: 115kV, 3-phase, 60 Hertz

Conductor: 795 kcmil ACSR, 26/7

Structures: Reuse existing double circuit lattice steel towers with the conductors in a horizontal configuration

Shieldwires: Located above the conductors consist of one Fiber Optic Shield Wire, 36 fiber optic strands, equivalent to 3/8" EHS Galvanized steel.

Horizontal Distance between conductors: 12 feet

Vertical Distance at the tower between the conductors and the shieldwire: 10 feet

#### **4. Elevation of Water Level**

The water surface elevation of the Cold River used for design at the crossing was 234.0 feet (on August 20, 2003) above MSL based on NGVD of 1929. The 100-

year flood elevation at the same location is 255.0 based on FEMA Maps dated May 23, 2006.

5. **Rounding**

All elevations have been rounded to the nearest one-tenth of a foot.

6. **Applicable Area of Water Body**

The Route 12A bridge over the Cold River is located downstream of the I-135N line and obstructs sailboats coming up from the Connecticut River. Under normal conditions, the area under this wire crossing is shallow, making the area unsuitable for sailboats.

7. **Maximum Sag and Clearance (each span)**

The governing case is maximum sag and clearance to both water and land with phase conductors at maximum quantity temperature of 284°F.

8. **Condition Producing Minimum Clearance for Phase Conductors – expected and NESC clearance**

The governing case is maximum sag and clearance to both water and land with phase conductors at maximum operating temperature.

With the conductor at maximum sag, which occurs at the maximum operating temperature of 284°F, the NESC clearance requirement to the water is 18.6 feet, based on water areas not suitable for sailboating or where sailboating is prohibited.

The minimum clearance at the crossing is designed to be 40.0 feet at 284°F.

9. **Conductor Producing Minimum Clearance for Neutral/Static Conductors – expected and NESC clearance**

- a. Expected Clearance: 40.0 feet at maximum conductor sag
- b. NESC Clearance Requirement: 18.6 feet at maximum conductor sag  
Based on the NESC clearance requirement to the water areas not suitable for sailboating or where sailboating is prohibited.

10: **Combinations of Conditions Between Phase and Neutral/Static Conductors**

Governing condition: Shieldwire at NESC Heavy, and conductor at 0F bare.

- a. Expected clearance: 30.0 feet
- b. NESC clearance requirement: 4.8 feet

Based on the NESC clearance for span wires parallel to the line

**11. Minimum Clearance for Phase Conductors to Both Water and Land**

The minimum clearance at the crossing is designed to be 40 feet at 284°F.

**12. Permits and Approvals**

All necessary permit applications have been filed or will be filed including wetland applications.

**13. Maintenance and Operation of Crossing**

The Crossing will be maintained and operated in compliance with NESC at all times.

**14. Easement Rights**

The line is located within an existing easement.

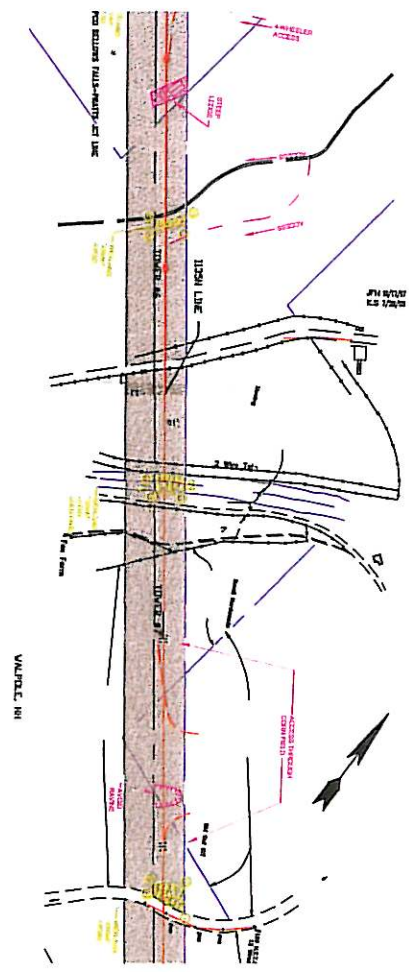
**15. Public Rights on Public Water or Lands**

The public's use and enjoyment of the Cold River will not be diminished in any material respect as the result of the I-135N reconductoring and the crossing subject to this Petition.

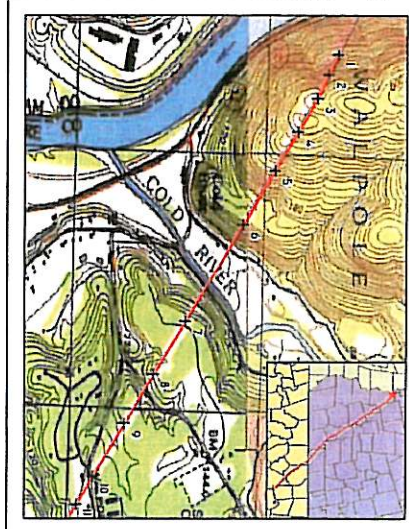
**16. Plan Requirements**

Please see attached Plan of I-135N Cold River Crossing.

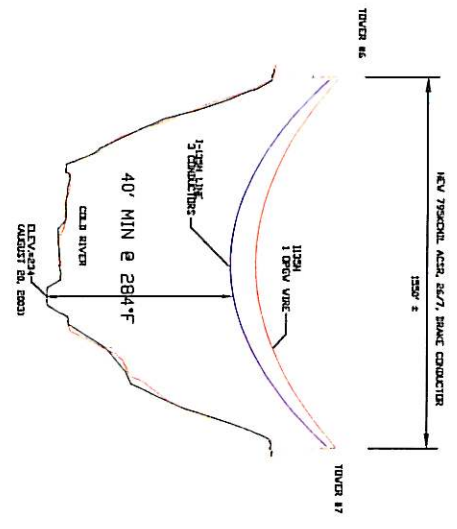




**PLAN**  
SCALE: 1"=50'  
SCALE OF FEET  
0 100 200



**KEY MAP**  
MAP SOURCE - USGS TOPOGRAPHIC IMAGE  
SCALE - 1:24,000  
0 0.125 0.25 0.5 0.75 1 1.25  
MILES



**PROFILE**  
HORIZONTAL: 1"=50'  
VERTICAL: 1"=100'

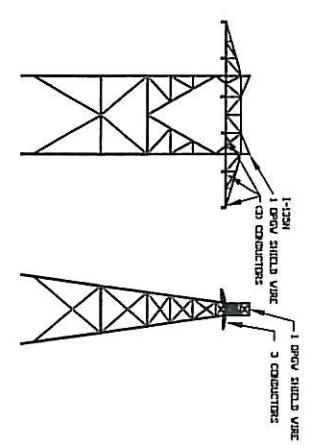
(August 20, 2003) = Date Flown

**LEGEND**

••• Tower Location

Existing Conductor to be Replaced

New England Power Company  
Plan Showing Location of  
1-135N Transmission Line  
Over and Across  
Cold River  
Walpole, New Hampshire  
Scale: As Shown  
Date: October 2007



**ELEVATION**  
SCALE: 1"=20'  
Facing West

**SIDE ELEVATION**  
SCALE: 1"=20'

115KV LINE  
LINE CROSSING OF THE COLD RIVER  
IN WALPOLE, NH  
PLAN & PROFILE  
SCALE: 1:50

DESIGN	DATE	BY
DESIGNED BY	1/7/07	
CHECKED BY		
INFORMED BY		
APPROVED BY		

**nationalgrid**

REV	DATE	DESCRIPTION	BY	CHKD	APPD	SCALE
1	1/7/07					
2						
3						
4						
5						
6						
7						
8						
9						
10						

INCHES ON ORIGINAL