**THE STATE OF NEW HAMPSHIRE**
**BEFORE THE**
**PUBLIC UTILITIES COMMISSION**

PETITION OF PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE FOR LICENSES TO CONSTRUCT AND MAINTAIN ELECTRIC LINES AND FIBER OPTIC CABLE OVER AND ACROSS PUBLIC WATERS IN THE CITIES OF CONCORD AND FRANKLIN, AND TOWNS OF BOW, NORTHFIELD AND PEMBROKE, NEW HAMPSHIRE.

TO THE PUBLIC UTILITIES COMMISSION:

Public Service Company of New Hampshire ("PSNH"), a public utility engaged in the generation, transmission, distribution and sale of electricity in the State of New Hampshire, hereby petitions the Public Utilities Commission ("Commission"), pursuant to RSA 371:17, for licenses to construct and maintain electric lines and fiber optic cable at six locations over and across public waters in the Cities of Concord and Franklin, and the Towns of Bow, Northfield and Pembroke, New Hampshire, and in support of its petition states as follows:

1. In order to meet the reasonable requirements of service to the public, PSNH has previously constructed and currently operates and maintains a 115 kV transmission line, designated as line V-182. The V-182 line runs between PSNH's Garvins Substation in Bow, New Hampshire, and PSNH's Webster Substation, in Franklin, New Hampshire, and is an integral part of the PSNH transmission system and the overall New England transmission grid. The V-182 line, as presently constructed, crosses public water bodies at six locations in the Cities of Concord and Franklin, and the Towns of Bow, Northfield and Pembroke, New Hampshire. With the exception of the two existing crossings of the Soucook River in Concord and Pembroke, the overhead crossings of the V-182 line at these locations have been previously licensed by the Commission and are listed in Table 1 attached to this Petition. [1]

2. In order to continue to meet the reasonable requirements of service to the public, PSNH has determined it is necessary to upgrade the V-182 line conductors to increase the power transfer capability of the line. This need is a result of load growth in the central part of New Hampshire. The V-182 line is the smaller of two 115kV circuits that traverse northerly from Merrimack Station in Bow, New Hampshire, to the Webster Substation in Franklin, New Hampshire. When Merrimack Station is running, the loss of

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[1] The V-182 line crossings of Turtle Town Pond (formerly Turtle Pond) in Concord were previously licensed under the same Commission order as two crossings. The rebuild of the V-182 will cross Turtle Town Pond in eight contiguous spans, which this Petition treats as two licensed crossings at this location. The V-182 line crossings of the Soucook River were apparently not previously licensed due to either oversight or to the application of navigability or other crossing license criteria at the time of original construction. The rebuild of the V-182 crossings of the Soucook River will be licensed under this Petition.

the larger line causes the V-182 line to exceed its thermal capabilities. Rebuilding the V-182 line will allow PSNH to provide reliable electric service to its customers in this area of the State.

3. The necessary conductor upgrade of the V-182 line will require that the line and its associated water crossings be rebuilt within the right-of-way corridor that it presently occupies. The existing V-182 line pole structures, most of which are of H-Frame type construction, will be replaced with new structures designed to handle the increased loads of the larger conductor. The existing 336 ACSR 26/7 phase wires will be replaced with 1590 ACSR 45/7. A majority of the line will be rebuilt utilizing single pole structures with davit arms. In these locations, the two existing static wires will be replaced with only one new optical ground wire, containing fiber optic cable, known as OPGW cable. Use of OPGW cable instead of regular static wire will improve and enhance the reliability and capacity of the communications systems used in PSNH's electric system operations. Where the existing H-Frame type structures are being replaced with new H-Frame type structures or deadend structures, one 7#8 Alumoweld static wire and one OPGW cable will be installed.

4. Rebuilding the V-182 line will require construction of new overhead crossings at the following public water body locations: two locations on the Merrimack River, one located on the Bow/Concord town line and the other located on the Franklin/Northfield town line, two locations on the Soucook River both located on the Concord/Pembroke town line, Turtle Town Pond located in Concord, and Chance Pond located in Franklin. The location map, design and proposed construction plan and profile drawing, and required clearance calculations for each of the new crossings are attached to this petition as Appendices A through G, inclusive.[2]

5. The required technical information provided in this petition is based on the 2007 National Electrical Safety Code (NESC) C2-2007.

6. All public water bodies will be spanned using laminated wood structures. These structures will either be deadend structures (Type DA) or tangent structures (Type WT-1), depending on the design criteria for each crossing. Detail design specifications for each of these structure types are attached to this petition as FIGURES 1 and 2, respectively. As shown on FIGURE 1, the phase wires have an approximate separation at the structure of 14' horizontal. The static wire is carried on the structure by a support bracket approximately 12" down from the top of the structure. As shown on FIGURE 2, the top and middle phase wires have an approximate separation at the structure of 7' vertically and 12' horizontally, while the middle and bottom phase wires are 8' vertically and 13' horizontally. The static wire is carried on the structure by a support bracket approximately 6" down from the top of the structure.

7. Flood water elevations for the crossings were based on information contained in flood insurance rate maps obtained from FEMA. Table 232-1 of the NESC

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[2] Because of its width, the eight-span crossing of Turtle Town Pond in Concord is covered in two Appendices (D and E).

states that the minimum clearance over a water body must be based on a 10-yr flood elevation. For the purpose of the design of all but the Turtle Town Pond crossings, the 100-yr flood elevation was used. It should be noted that the 100-year elevations, would be well above the 10-year flood elevation. No FEMA maps were available for Turtle Town Pond. Consequently, the Turtle Town Pond water crossing designs were based upon an assumed high water level determined using good engineering judgment, as is more particularly explained in Appendices D and E.

8. Based on Table 232-1 of the NESC, for open supply conductors 750 V to 22 kV to ground, the minimum clearance to the water surface during normal flood level (100-yr flood, or as assumed in the case of Turtle Town Pond, for the purpose of this Petition) is 20.5' (for waters less than 20 acres), 28.5' (for waters 20-200 acres), and 34.5' (for waters 200-2000 acres). NESC Rule 232.C.1.a states that an additional clearance of 1.6-ft or [(69.7 kV-22 kV) x 0.4] is needed for 115 kV, which brings the total required minimum clearance to 22.1', 30.1', and 36.1', respectively. For overhead shield/surge protection wires that meet NESC Rule 230.E.1, the minimum clearance to the water surface at the normal flood level is 17.5', 25.5', and 31.5' respectively for those water bodies. As the static wires are located above the phase wires at all crossings, this NESC minimum clearance requirement will always be met. Based on Table 232-1 of the NESC, for open supply conductors 750 V to 22 kV to ground, the minimum clearance to roads subject to truck traffic is 18.5'. With the additional 1.6' of clearance required for 115 kV, the total required clearance is 20.1'.

9. A total of three phase wires and one OPGW cable will span each water crossing. Where three (3) pole deadend structures are installed on either side of the crossings, an additional shield wire will be installed. This wire shall be 7#8 Alumoweld. All three 1590 ACSR 45/7 phase conductors and the shield wire(s) will be sagged using the NESC Heavy Loading (0 degrees F., 4 pounds per square foot wind loading, ½-inch radial ice) sag charts upon installation in the field. The 1590 ACSR conductors will be sagged using a maximum tension of 10,000 pounds (unless stated otherwise in the Appendices to this Petition) and the shield wire(s) will be sagged using a maximum tension of approximately 4,500 pounds (unless stated otherwise in the Appendices to this Petition). The sags and clearances to the water surface for each of the proposed crossings are provided in the attached Appendices.

10. With the exception of the crossing of Turtle Town Pond in Concord (Appendices D and E), none of the new crossing structures will be set within jurisdictional wetlands or other areas that will require New Hampshire Department of Environmental Services (NHDES) permitting. The appropriate NHDES wetlands permits will be applied for and obtained by PSNH prior to the installation of any of the new structures associated with the crossing at this location in Concord. In the event that wetland permits are required to gain access to any of the other new crossing structures, such permits will likewise be obtained by PSNH prior to construction.

11. The proposed crossings have been designed and will be constructed, maintained and operated by PSNH in accordance with the applicable requirements of the NESC.

12. With the exception of both sides of the Merrimack River crossing on the Bow/Concord town line (Appendix A), which is land owned by PSNH, PSNH owns permanent easements, not less than a minimum of 225' wide, for its lines and facilities on both sides of the public water bodies at all of the proposed crossing locations. Each of the crossings will be constructed within the limits of those easements.

13. PSNH submits that the licenses petitioned for herein may be exercised without substantially affecting the rights of the public in the public waters listed in this Petition. Minimum safe line clearances above all water surfaces and affected shorelines will be maintained at all times. The use and enjoyment by the public will not be diminished in any material respect as a result of the overhead line and cable crossings.

WHEREFORE, PSNH 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 PSNH licenses to construct and maintain electric lines and fiber optic cable over and across the public waters as specified in the Petition; and

c. Issue an Order Nisi and orders for its publication.

Dated at Manchester this 24th day of April, 2008.

Respectfully submitted,

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
By Its Attorney

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Senior Counsel, Legal Department
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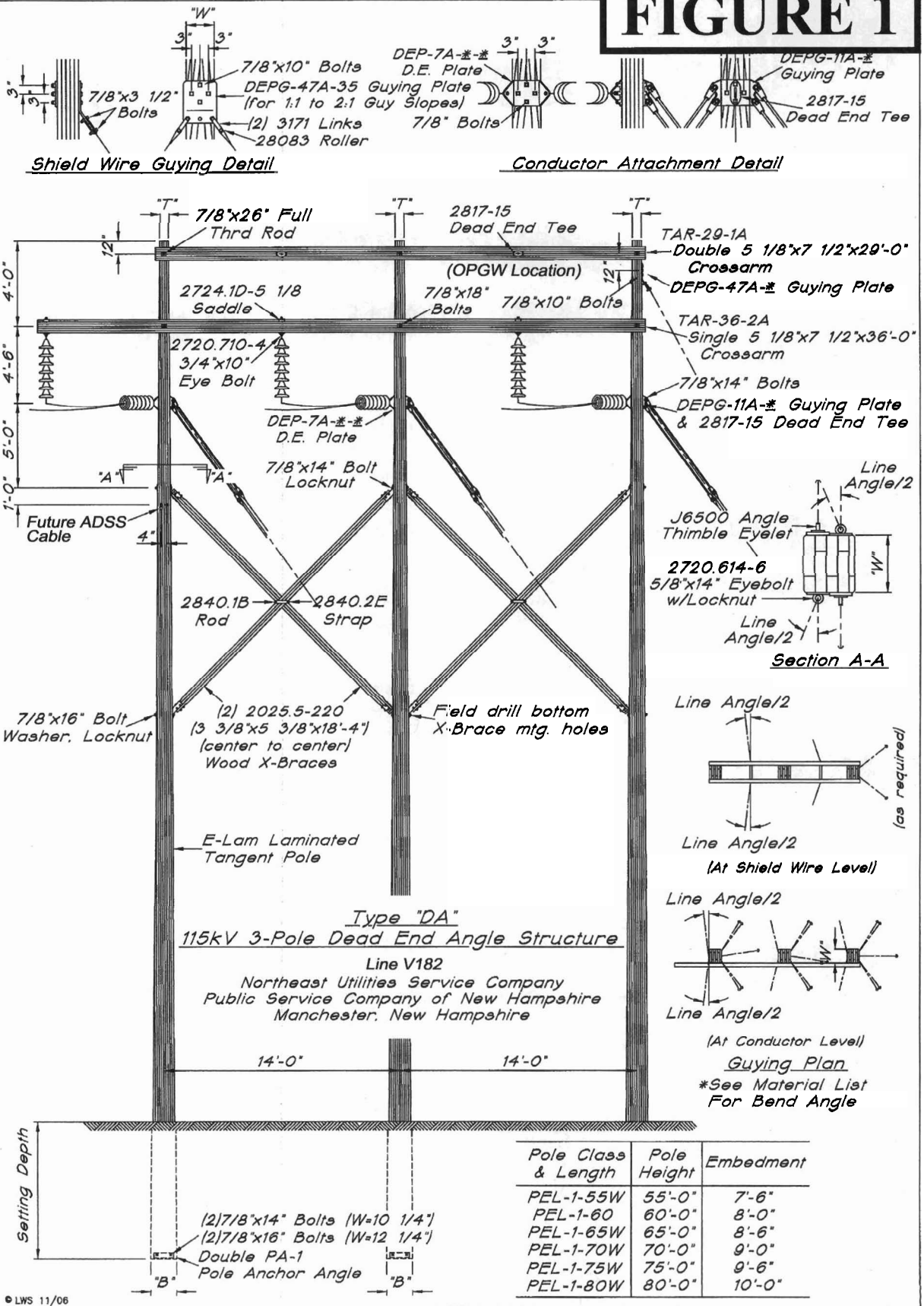
Table 1
Crossing Licenses
For Existing V-182 Line

| Town | Water Body | NHPUC Order Number | NHPUC Docket No. | Current Petition Appendix |
|---|---|---|---|---|
| | | | | |
| **Bow-Concord** | | | | |
| | Merrimack River | 12,219 | DE 76-22 | A |
| | | | | |
| **Concord-Pembroke** | | | | |
| | Soucook River | Not Previously Licensed | | B |
| | Soucook River | Not Previously Licensed | | C |
| | | | | |
| **Concord** | | | | |
| | Turtle Town Pond | 21,817 | DE 94-272 | D |
| | Turtle Town Pond | 21,817 | DE 94-272 | E |
| **Franklin-Northfield** | | | | |
| | Merrimack River | 12,219 | DE 76-22 | F |
| | | | | |
| **Franklin** | | | | |
| | Chance Pond | 18,782 | DE 87-131 | G |
| | | | | |

# FIGURE 1




| Pole Class & Length | Pole Height | Embedment |
|---|---|---|
| PEL-1-55W | 55'-0" | 7'-6" |
| PEL-1-60 | 60'-0" | 8'-0" |
| PEL-1-65W | 65'-0" | 8'-6" |
| PEL-1-70W | 70'-0" | 9'-0" |
| PEL-1-75W | 75'-0" | 9'-6" |
| PEL-1-80W | 80'-0" | 10'-0" |

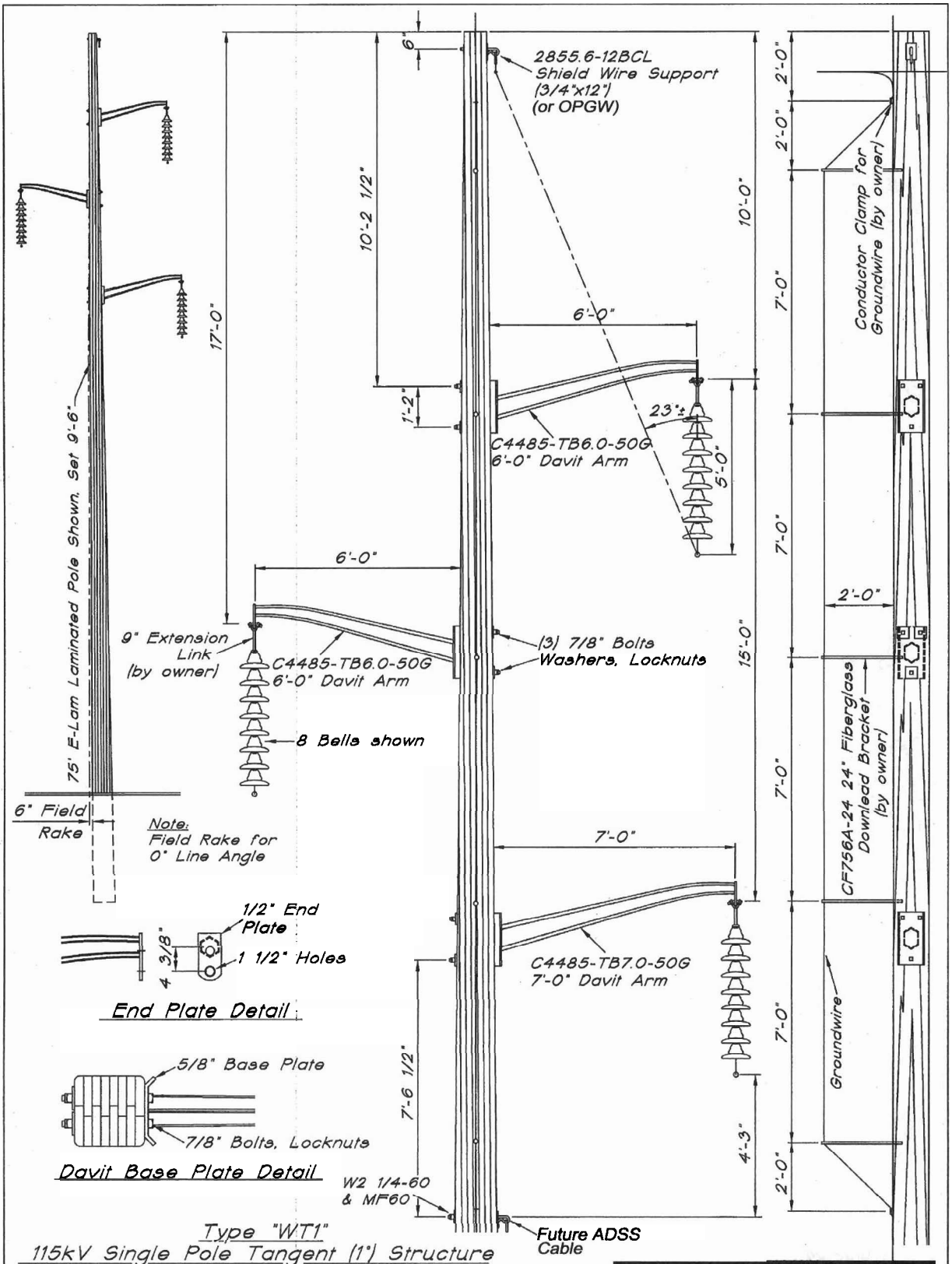


| NO. | REVISION | DATE | CK. |
|---|---|---|---|
| 3. | | 12-20-06 | |
| 2. | | 12-19-06 | |
| 1. | | 12-4-06 | |

ACAD DWG. FILE: NESC5803A1

Laminated Wood Systems, Inc.
E-LAM
P.O. BOX 386, SEWARD, NE 68434 1-800-949-ELAM

| DRAWN | DATE | DWG. NO. |
|---|---|---|
| D. Policky | 11-27-06 | NESC-0058.03A1 |




Type "WT1"
115kV Single Pole Tangent (1°) Structure

Line V182
Northeast Utilities Service Company
Public Service Company of New Hampshire
Manchester, New Hampshire

# FIGURE 2

| NO. | REVISION | DATE | CK. |
|---|---|---|---|
| | | | |

ACAD DWG. FILE: NESC5401A1

Laminated Wood Systems, Inc.

E-LAM

P.O. BOX 386, SEWARD, NE 68434 1-800-949-ELAM

| DRAWN | DATE | DWG. NO. |
|---|---|---|
| D. Policky | 7-25-06 | NESC-0054.01A1 |