

**Public Service Company of New Hampshire d/b/a Eversource Energy**  
**Docket No. DE 20-161**

**Date Request Received: April 15, 2022**  
**Data Request No. DOE 5-005**

**Date of Response: April 27, 2022**  
**Page 1 of 3**

**Request from: Department of Energy**

**Witness: Freeman, Lavelle A**

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**Request:**

Refer to the Settlement Agreement (March 11, 2020) in Dkt. No. DE 19-139 and both of the Company's LCIRP filings. In the Settlement Agreement (March 11, 2020) in Dkt. No. DE 19-139, the Company agreed that it would meet certain specifications (a/k/a responsibilities) for its next LCIRP submission(s). The specifications were described in the Settlement Agreement (S/A) at pp 4 through 6, approved by the Commission in Order No. 26, 362 at 5-6 (June 3, 2020) (referencing the Company's 2020 LCIRP commitments). Has the Company met all of the specifications? Please explain in detail. Please provide any matrix, summary, listing, checklist, or cross reference between the Company's responsibilities as described in the Settlement Agreement (3/11/2020) (Docket No. DE 19-139) pages 4 through 6, and the sections of the Company's LCIRP filing(s) to demonstrate that the Company's responsibilities/specifications were met. The specification/responsibility topics include:

- a. Comprehensiveness of 2020 LCIRP
  - i. Load Forecast
  - ii. Assessment of Distribution System requirements
  - iii. Assessment of Demand Side Management Programs
    1. NWS Candidates
    2. Detailed NWS Potential Analysis
    3. Incorporation of NWS into Utility Planning
- b. Planning Criteria Revisions

**Response:**

Appendix A of the October 1, 2020 filing provides a summary of the Company's compliance with the LCIRP requirements set forth in RSA 378:38, RSA 4-E:1, and the Settlement Agreements approved by the Commission in Docket No. DE 19-139 and Docket DE 17-136.

As set forth in Appendix A, the Company complied with the Settlement Agreement approved in DE 19-139 as follows:

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**Load Forecast**

The forecast of future demand for the Company's service area is described in Section 5.1 of the LCIRP. Details are provided in Appendices B (regional level) and C (substation level).

**Assessment of Distribution System Requirements**

The October 1, 2020 LCIRP filing provides the following assessments: Equipment Ratings (Section 5.2), Bulk Substations and Feeders (Section 5.3), Non-Bulk Substations (Section 5.4), Distribution Circuit Planning (Section 5.5), Distribution System Planning Criteria (Section 5.6), and Smart Grid (Section 10 and Appendix J). The Distribution System Planning Guide is provided in Appendix D.

The October 1, 2020 LCIRP filing Appendix K (Grid Needs Assessment) includes information on the grid needs estimated at greater than \$250,000 for Bulk Substations, Non-bulk Substations, and distribution lines.

The October 1, 2020 LCIRP filing Appendix L (Project Authorization Forms) provides approval documentation for non-bulk substation and distribution line projects approved by the New Hampshire Project Approval Committee or the Solution Design Committee.

The March 31, 2021 LCIRP Supplemental filing (Appendix B, C, D, E and F) provides planning studies and project approval documents related to numerous substation and line projects.

**Assessment of Demand Side Management Programs**

Demand Side Energy Management programs are described in the October 1, 2020 LCIRP filing (Section 11).

**NWS Candidates**

As described in the October 1, 2020 LCIRP filing Appendix A, Section 2 (Bates pages 55-56), the Company developed a list potential non-wire solutions candidate that was shared with Commission Staff and the Office of Consumer Advocate in August 2020.

**Detailed NWS Potential Analysis**

Following selection of the Loudon Substation as the location for the detailed NWS analysis, the Company included the NWS analysis as Appendix A-2 to March 31, 2021 Supplemental filing (Bates pages 47-86). The Company also provided the Non-Wires Alternative Framework describing the screening tool used to conduct the Loudon Substation analysis as Appendix A-1 of its supplemental filing.

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**Incorporation of NWS into Utility Planning**

The October 1, 2020 LCIRP filing (Section 11.4) describes how NWS alternatives are incorporated into utility planning. See also the Distribution System Planning Guide (October 1, 2020 LCIRP filing Appendix D, section 4.8.3) and the NWA Framework provided in the March 31, 2021 LCIRP Supplemental filing (Appendix A-1).

**Planning Criteria Revisions**

The Planning Criteria Revisions are described in Section 5 of the LCIRP. Appendix D of the LCIRP also provides the newly developed Distribution System Planning Guide that will be the basis for distribution system planning at Eversource. As noted above, the Company's supplemental filing included a description of the non-wires alternative screening tool.

**Public Service Company of New Hampshire d/b/a Eversource Energy**  
**Docket No. DE 20-161**

**Date Request Received: May 16, 2022**  
**Data Request No. DOE 6-003**

**Date of Response: May 27, 2022**  
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**Request from: Department of Energy**

**Witness: Hebsch, Jennifer J**

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**Request:**

Reference data response DOE 4-2. Please supply the following information for the T&D Engineering Standards Bookshelf:

- a. "Screen Shot of Books" in pdf format of what the user sees when the Bookshelf is initially accessed.
- b. Table of contents for each book/standard in the Bookshelf.
- c. Process for adding-to and/or updating Bookshelf contents.

**Response:**

- a. Attachment DOE 06-003(a) is a pdf screen shot of the Standards Bookshelf.
- b. Attachment DOE 6-003(b) includes the table of contents, as applicable, for each book in the Standards Bookshelf.

**Distribution System Engineering Manual** – Only the front page/contents of this book is attached.

**Emergency Procedures** – Only the front page/contents of this book is attached.

**Maintenance Program - EMP** – Only the front page and index for this book is attached.

**Material** – Only the front page/contents of this book is attached.

**New Services** – The front page of the book is attached with the NH Requirements for Electric Service Connections table of contents.

**Overhead** – Only the front page/contents of this book is attached.

**Specifications** – Only the front page/contents of this book is attached.

**System Planning** – All table of contents attached.

**Tool & Equipment** – Only the front page/contents of this book is attached.

**Transmission & Substation** – All table of contents attached.

**Underground** - Only the front page/contents of this book is attached.

**Work Methods** – Two levels into the table of contents of this book is attached.

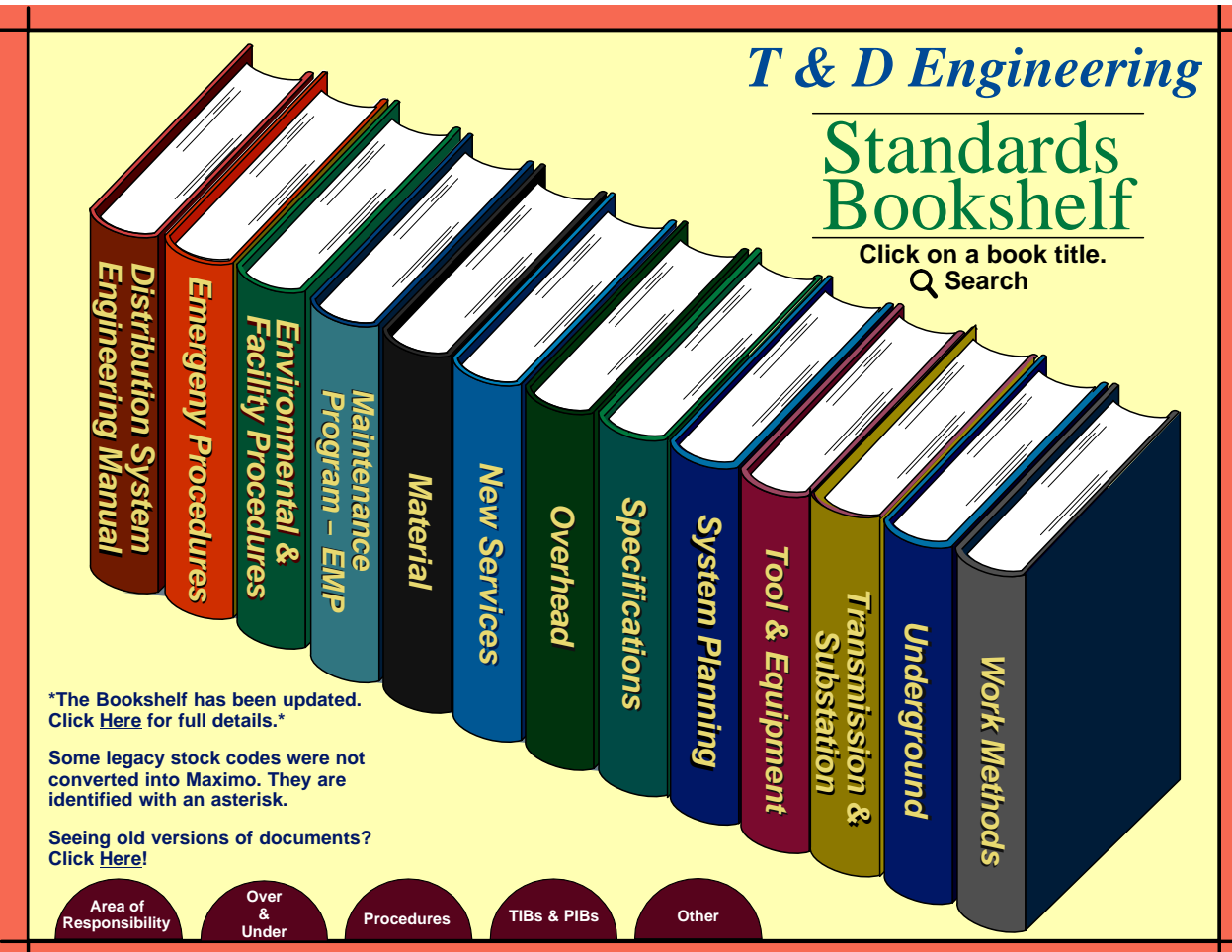
**Public Service Company of New Hampshire d/b/a Eversource Energy**  
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The Company's **Environmental and Facility Procedures** is no longer populated and therefore is not included in Attachment DOE 6-003(b).

- c. Attachment DOE 6-003(c) is TD Procedure - TD003 Document Control Process which describes the process for adding-to and/or updating Bookshelf contents.



**T & D Engineering**  
**Standards Bookshelf**

Click on a book title.  
🔍 Search

**Distribution System Engineering Manual**  
**Emergency Procedures**  
**Environmental & Facility Procedures**  
**Maintenance Program – EMP**  
**Material**  
**New Services**  
**Overhead**  
**Specifications**  
**System Planning**  
**Tool & Equipment**  
**Transmission & Substation**  
**Underground**  
**Work Methods**

\*The Bookshelf has been updated. Click [Here](#) for full details.\*

Some legacy stock codes were not converted into Maximo. They are identified with an asterisk.

Seeing old versions of documents? Click [Here](#)!

Area of Responsibility    Over & Under    Procedures    TIBs & PIBs    Other

# Distribution System Engineering Manual

- 01 – General
- 02 – Reliability
- 03 – Economics
- 04 – Calculations
- 05 – Design General
- 06 – Overhead Design
- 07 – Underground Design
- 08 – Conductors
- 09 – Arresters
- 10 – Protection
- 11 – Switches & Switchgear
- 12 – Capacitors
- 13 – Regulators
- 14 – Transformers
- 15 – Overhead Services & Secondaries
- 16 – Underground/DB Service & Secondaries
- 17 – Power Quality
- 18 – Substation
- 19 – Distributed Generation

Common Abbreviations:

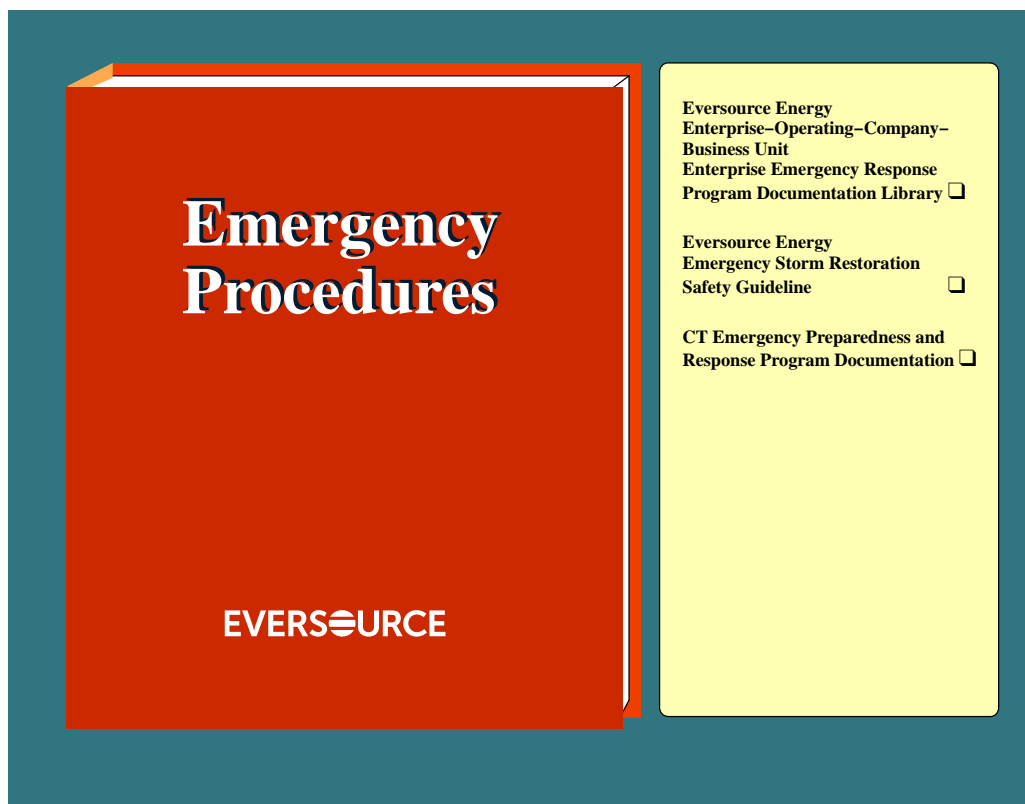
By Name

By Abbreviation

**Index of Distribution  
Engineering Reports (DERs)**

**Eversource Standard  
Consolidation**

**Technical Information**





# Eversource Maintenance Program

## Maintenance Books

- Transmission & Distribution System
- Gas System

## User Feedback System

- Submit New Feedback
- Feedback History
- Print User Feedback Form

## INDEX OF EVERSOURCE MAINTENANCE PROGRAM

Subject	Document Number	Revision Number	Effective Date MM/DD/YYYY
Maintenance Policy	n/a	2	8/6/2014
Introduction - Distribution Maintenance	5.00	5	10/1/2013
Spare			
Aircraft Warning Lights	5.74	1	7/1/2015
Arresters, Lighting	5.25	7	1/1/2017
Spare			
Batteries and Chargers	5.03	6	8/31/2016
Spare			
Cable Pump Houses & Controls	5.68	0	6/1/2015
Capacitors	5.05	5	7/1/2015
Circuit Breakers			
SF6	5.38	5	6/21/2021
Oil	5.39	6	6/21/2021
Vacuum, outdoor	5.40	6	6/21/2021
Air	5.41	6	6/21/2021
Circuit Breakers - Vacuum, Switchgear	5.42	5	7/1/2015
Circuit Switchers	5.07	3	6/1/2015
Spare			
Compressors - Air	5.08	4	6/1/2021
Customer Above Ground Installations	5.10	3	7/1/2015
Direct Buried Systems	5.11	4	6/1/2015
Spare			
Fault Indicator, Overhead	5.32	3	1/1/2017
Spare			
Generator, Emergency	5.18	3	7/1/2015
Infrared Survey	5.22	5	7/1/2015
Load Tap Changers - Superseded by EMP 5.58	5.27	4	11/23/2021
Meters - Transducers	5.75	0	6/1/2015
Spare			
Network Protectors	5.29	3	7/1/2015
Neutral Isolations	5.66	3	7/1/2015
Spare			
Overhead Plant	5.33	5	1/1/2017
Poles, Metal Streetlight	5.52	3	7/1/2015
Poles, Wood	5.61	3	7/1/2015
Power Line Carrier	5.02	0	1/7/2021

## INDEX OF EVERSOURCE MAINTENANCE PROGRAM

<b>Subject</b>	<b>Document Number</b>	<b>Revision Number</b>	<b>Effective Date MM/DD/YYYY</b>
Reactor, Air Core	5.70	0	6/1/2015
Reclosers and Sectionalizers	5.44	4	7/1/2015
Regulators, Voltage	5.01	4	7/1/2015
Relay, Distribution Protective	5.17	3	7/1/2015
Spare			
Resistive Potential Devices - RPD	5.72	0	6/1/2015
Right of Way Inspection	5.45	4	1/31/2017
SCADA RTU	5.76	0	6/1/2015
Spare			
Static Compensator	5.69	0	6/1/2015
Streetlights and Floodlights	5.48	1	8/19/2011
Substation Property Inspection	5.56	3	8/31/2016
Spare			
Spare			
Switches, Disconnect	5.15	4	7/1/2015
Switches, Substation Vacuum	5.31	3	7/1/2015
Switches, Transfer	5.47	2	6/1/2015
Switches, Underground	5.51	2	7/1/2015
Switchgear, Metal-Clad	5.65	2	7/1/2015
Switchgear, Pad-Mounted	5.34	3	7/1/2015
Spare			
Touch Potential	5.62	2	7/1/2015
Transformer, Coupling Capacitor Voltage (CCVT)	5.71	0	6/1/2015
Transformers, Network	5.30	3	6/1/2015
Transformers, Potential	5.43	5	6/2/2021
Transformers, Station Service	5.67	0	6/1/2015
Transformers, Substation	5.58	5	7/1/2015
Transformers, Underground	5.55	3	7/1/2015
Transmission Cables	5.77	0	2/10/2016
Transmission Overhead	5.78	0	2/10/2016
Spare			
Spare			
Vault, Underground	5.59	4	10/12/2015
Vegetation Management	5.60	2	7/1/2015

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## Material Book

By Name

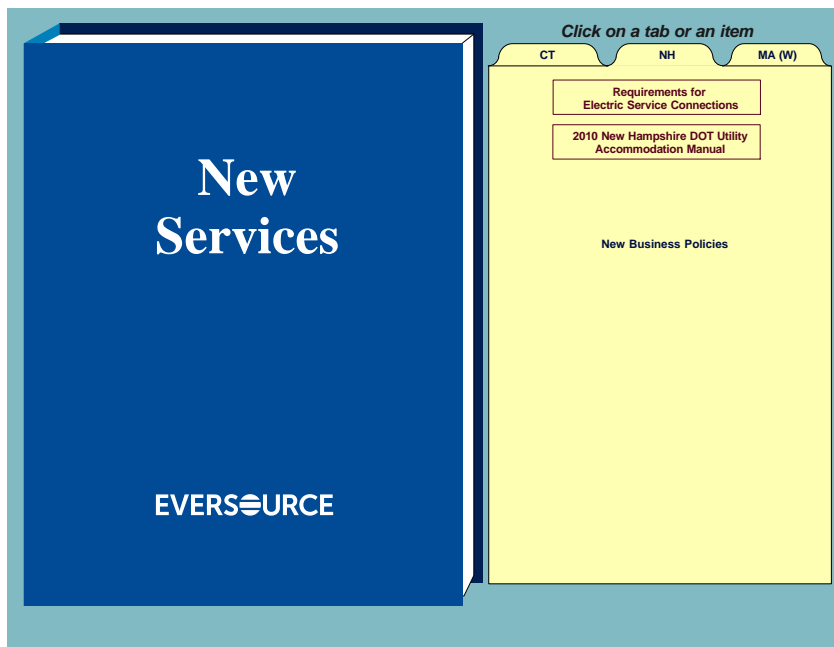
A	I	R
B	J	S
C	K	T
D	L	V
E	M	W
F	N	Y
G	O	
H	P	

Catalogs

Common Abbreviations:  
By Name  
By Abbreviation

Legend  
MSL

EVERSOURCE



**REQUIREMENTS FOR**  
Electric  
Service  
Connections

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Conjunctional Generating Equipment - Subsection 920	23
Qualifying Cogenerators, Qualifying Small Power Producers, and Limited Electrical Energy Producers- Subsections 930 - 931	24
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# Overhead Distribution

## Construction Standards

- 00 – General
- 03 – Construction Guidelines/ Line Sensors
- 04 – Clearances
- 05 – Poles
- 06 – Anchors, Guys & Pole Class
- 07 – General Information/ Antennas
- 08 – 4.8kV Pre-Build
- 09 – Conversions Minimum Reconstruction
- 10 – Distribution Pole Tops
- 11 – 27.6 kV & Multiple Circuits
- 12 – Risers
- 13 – Secondaries
- 14 – Services
- 15 – ADSS Fiber Optic Cables

## Construction Standards

- 16 – Arresters & Grounds
- 17 – Transformers
- 18 – Cutouts and Solid Blade Disconnects  
Switches & Sectionalizers  
Reclosers
- 19 – Capacitors
- 20 – Regulators
- 21 – Lighting
- 32 – Conductors – General
- 33 – Connectors & Splices
- 35 – Metering
- 36 – Distributed Generation

Common Abbreviations:  
By Name  
By Abbreviation

OH DTR Locator

 Search

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# System Planning

## System Planning Manual

- Transmission
- Distribution
- DER

## System Planning

- Distributed Generation Policies
- SysPlan Index

Technical Information

<b>EVERSOURCE</b>	<h2>System Planning</h2>
<h3>System Planning Index</h3>	

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**RETIRED DOCUMENTS**

	Section	Applicability	Doc #	Revision Number	Effective Date
1.0	Creation, Review and Approval of System Planning Group Procedures	All	SYSPLAN 000	1	5/15/2014
2.0	Transmission Reliability Standards	All	SYSPLAN 001	0	4/20/2018
3.0	Transmission Planning Procedure - Transmission System Modeling	All	SYSPLAN 002	1	1/20/2019
4.0	Transmission Planning Procedure - Bulk Power System Assessment Methodology	All	SYSPLAN 003	2	11/10/2011
5.0	System Planning Procedure - Major Project Planning and Development Process	All	SYSPLAN 004	1	7/14/2008
6.0	Planning Assessments of Pilgrim Nuclear Power Station Transmission and Back-up Supply	All	SYSPLAN 005	1	3/29/2010
7.0	Determining Transmission System Facility Ratings on the EMA Transmission System	EMA	SYSPLAN 006	2	6/10/2016
8.0	Calculation and Documentation of Auto Transformer Ratings	EMA	SYSPLAN 007	0	5/15/2014
9.0	Calculation and Documentation of Bulk Distribution Transformer Ratings	All	SYSPLAN 008	1	6/11/2008
10.0	Bulk Distribution Substation Assessment Procedure	All	SYSPLAN 010	1	8/1/2018
11.0	Evaluation of Distributed Generation Interconnection Applications	All	SYSPLAN 011	0	3/15/2013
12.0	Transmission Interconnection Process Roadmap	All	SYSPLAN 012	0	8/21/2012
13.0	Eversource EMA Load Shedding Program	EMA	SYSPLAN 014	1	12/30/2014
14.0	Consequential Load Loss Guideline	All	SYSPLAN 015	0	4/20/2018

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<b>RETIRED System Planning Index</b>	

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Section	Applicability	Doc #	Revision Number	Effective Date

<b>EVERSOURCE</b>	Distribution System Engineering Manual
<b>Distributed Generation Policies</b>	

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1.1	Interconnection Transformer Winding and Grounding	19.009
1.2	Power Quality Requirements (Flicker)	19.010
1.2.1	Transformer Reverse Power Capability	19.012
1.2.2	VAR Power Factor	19.013
1.2.3	VAR Operation Frequency	19.014
1.2.4	Transient Overvoltage	19.015
1.3	Utility Accessible Disconnect Switch	19.020
1.4	Utility Scale DER	
1.4.1	General Standards – Large-Scale DER	19.021
1.4.2	Substation Modification	19.022
1.4.3	Express Feeders	19.023
1.4.4	Right-of-Way	19.024
1.4.5	Power Factor Correction	19.025
1.4.6	Compliance with ISO-NE Operating Procedures 14 & 18	19.026
1.4.7	OP-17 Compliance Survey	19.027
1.4.8	Analyzing Non-Export Batteries, CHPs, and Base Loading Generation	19.028
1.5	DER Ride Through Settings	19.030


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<b>Distributed Generation Policies</b>	

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	2.2 Impact of DERs on Substation High Speed Bus Transfer Schemes	19.041
	2.3 Under-Frequency Load Shedding	19.042
	2.4 Closed Transition Generators	19.043
	2.5 Open Transition Generating Facilities	19.044
	2.6 Generator Step-Up Transformer Configurations	19.045
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<b>9.0</b>	Microgrids	TBD
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### Tool & Equipment Book

By Name

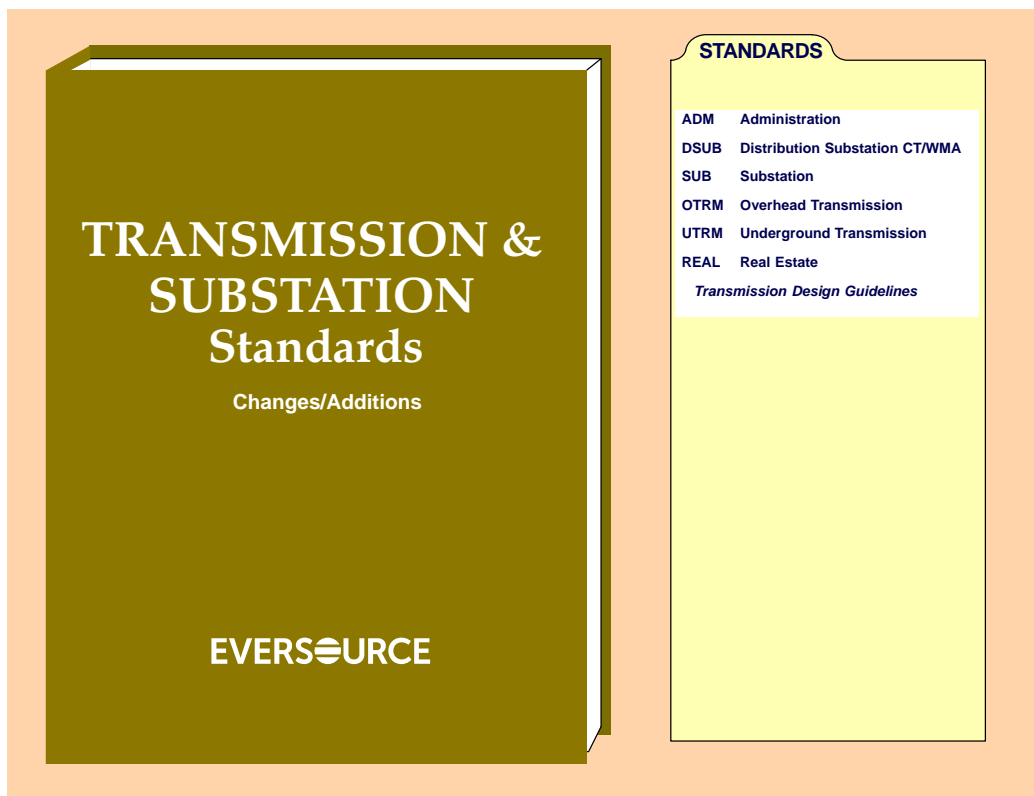
A	I	R
B	J	S
C	K	T
D	L	V
E	M	W
F	N	
G	O	
H	P	

General  
Common Abbreviations:  
By Name  
By Abbreviation  
Legend

**Tri-State Tool  
Committee**

Tools & Equipment Specifications  
5000 V 20 Kerte Jumper Cab..... SPC C-479  
Drawbar Pole..... SPC D-717  
Lineman's Leather Work Gloves..... SPC G-496  
Lineman's Leather Work Gloves..... SPC G-496  
General Purpose Rainsuit..... SPC R-007  
Lineman's Rainsuit..... SPC R-015  
Lineman's Rainsuit..... SPC R-016

**EVERSOURCE**  
Changes / Additions



**Northeast Utilities  
 Administrative Transmission Line Standards**

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Key:

- 00 Completed Standard
  - 00 Incomplete Standard
- 

- 00 Index
- 01 Preparation, Review, and Approval of Transmission Standards
- 02 Master Standards List
- 03 Spare
- 04 Control of As-Built (Record) Drawings
- 05 FTP Site Access
- 06 Incorporation of Documents into Transmission Standards by Cover Sheetting
- 08 – 99 Spare
- 09 Bases Documents

Revision History

Rev 0 – Original Index Posted 07/28/08

<b>Index</b>			
<b>Northeast Utilities</b>	<b>Administrative</b>	<b>ADM 00</b>	<b>Rev 0</b>
Approved by: KMS	NU Confidential Information	Page 1 of 1	8/13/2008

**Northeast Utilities  
 Administrative Transmission Line Standards**

Key:

- 00 Completed Standard
- 00 Incomplete Standard

- 00 Index
- 01 Preparation, Review, and Approval of Transmission Standards
- 02 Master Standards List
- 03 Spare
- 04 Control of As-Built (Record) Drawings
- 05 FTP Site Access
- 06 Incorporation of Documents into Transmission Standards by Cover Sheeting
- 08 – 99 Spare
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Revision History

Rev 0 – Original Index Posted 07/28/08

<b>Index</b>			
<b>Northeast Utilities</b>	<b>Administrative</b>	<b>ADM 00</b>	<b>Rev 0</b>
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Key:  
SUB 000 Posted  
SUB 000 Unposted

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SUB 002	Substation Primary One Line Diagrams
SUB 003	Basic Electrical Symbols – CL&P, WMECO
SUB 004	Drawing System
SUB 005	Nomenclature
SUB 006	SUB 006 345kV/115kV Substation Standards Design Criteria
SUB 007	Standard Voltages and Phasing
SUB 008	Substation Safety and Nomenclature Signs (Refer to TD 189)
SUB 009	Thermal Ratings
SUB 010	Substation Site Development
SUB 011	General Arrangements and Typical Designs
SUB 012	Substation Foundation Design
SUB 013	System 1 and System 2 Wiring Separation
SUB 014	Substation Ground
SUB 015	Substation Perimeter Fencing
SUB 016	Design of Substation Steel Structures
SUB 017	Bus Structural Design and Analysis
SUB 018	Disconnect Switch Application Guide
SUB 019	Outdoor Lighting
SUB 020	Cables
SUB 021	Capacitor Banks
SUB 022	Control Enclosure Components
SUB 023	Substation Electrical Clearances
SUB 024	Power Transformers, Reactors, Line Traps
SUB 025	Circuit Breakers, Circuit Switchers
SUB 026	Communications
SUB 027	Key Interlocking
SUB 028	Metering and Telemetering Testing
SUB 029	Protection & Control
SUB 030	Single & Three Line Diagrams, Panel Layouts, Phasing Diagrams
SUB 031	Relay and Control Circuit Fuse Wiring & Connections
SUB 032	Signs
SUB 033	Standard Installation Detail Drawings
SUB 034	Conduit and Trench Systems
SUB 035	SCADA Systems
SUB 036	Substation Sound Level Criteria
SUB 037	Backup Generator & Accessories

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- SUB 038 Substation Batteries & Chargers
- SUB 039 Surge Protection
- SUB 040 Direct Stroke Lightning Protection
- SUB 041 Substation Security (Retired – replaced by SUB 022.9)
- SUB 042 Equipment Structural Loading
- SUB 043 Coupling Capacitor Voltage Transformer (CCVT) Standard Drawings
- SUB 044 Spare
- SUB 045 Spare
- SUB 046 Animal Proofing Application Guide
- SUB 047 Secondary Oil Containment for Electrical Equipment
- SUB 048 005 Spare
- SUB 049 Protection and Control using IEC 61850 Protocol
- SUB 090 Telecommunication Structure Design & Analysis
- SUB 091 Substation Physical Hardening Protection
- SUB 092 005 Spare
- SUB 099 Design Basis Manual

Revision History

- Rev 0 – Original Index Posted 11/10/05
- Rev 1 – Changes to section 3.6, 13.27, 35, 42, 44, 45
- Rev 2 – Added section 8
- Rev 3 – Re-added section 30, 31, 32, 33 and 34
- Rev 4 – Added section 90
- Rev 5 – Added section 42, posted 10/1/06
- Rev 6 – Included PSN-drawing number in 004
- Rev 7 – Added section 47, posted on 04/23/07
- Rev 8 – Added SUB 006 Ground Survey, Removed Conduit and Trench Systems from SUB 013 11/23/2007
- Rev 9 – Added company revision SUB 13 Wiring Separation to conform to NPCC criteria 2/23/2007
- Rev 10 – Changed SUB 017 title from Bus, Insulators and Fittings to Bus Structural Design & Analysis 5/09/2008
- Rev 11 – Added to SUB 041 Animal Proofing
- Rev 12 – Changed Font to Gray on unposted Standards, Updated Header & Footer
- Rev 13 – Removed Sub 32 Confers to Sub 29 and Changed Bus 28 title to Protection and Controls
- Rev 14 – Added SUB 091, Substation Physical Hardening Protection, changed title from Northeast Utilities to EverSource.
- Rev 15 – Added SUB 043 line, change SUB 031 Wiring Diagrams to SUB 031 Relay and Control Circuit Fuse Wiring & Connections as a result of the removal of the Wiring Diagrams Index. 12/15/2015
- Rev 16 – Removed SUB 04 into indicated replacement standard 11/10/2017
- Rev 17 – Added Section 030 for new standard SUB 030.1 09/06/2019

**Key:**

SUB 000 Posted  
SUB 000 Unposted

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SUB 101 Index  
SUB 102 Substation Equipment Procurement Summary  
SUB 103 Unused  
SUB 104 Unused  
SUB 105 Unused  
SUB 106 Ground Survey (refer to OTRM 106)  
SUB 107 Unused  
SUB 108 Unused  
SUB 109 Unused  
SUB 110 Unused  
SUB 111 Unused  
SUB 112 Foundations  
SUB 113 Unused  
SUB 114 Grounding  
SUB 115 Chain Link Perimeter Fence  
SUB 116 Structures  
SUB 117 Substation Insulators  
SUB 118 Disconnect Switches  
SUB 119 Lighting  
SUB 120 Cables  
SUB 121 Capacitor Banks  
SUB 122 Control Enclosure  
SUB 123 Storage Enclosure  
SUB 124 Transformers, Reactors, Line Traps  
SUB 125 Circuit Breakers, Circuit Switchers  
SUB 126 Communication Systems  
SUB 127 Unused  
SUB 128 Metering  
SUB 129 Protective Relaying  
SUB 130 Switchboard Devices & Event Recording  
SUB 131 Unused  
SUB 132 Unused  
SUB 133 Unused  
SUB 134 Conduit & Trench Systems  
SUB 135 SCADA Systems  
SUB 136 Substation Sound Levels  
SUB 137 Backup Generator & Accessories  
SUB 138 Station Batteries & Chargers

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SUB 139 Surge Protection  
SUB 140 Direct Stroke Lightning Protection  
SUB 141 Substation Security  
**SUB 142 Fabrication of Structural Steel for Northeast Utilities Substations**  
SUB 143 Capacitor Voltage Transformers  
SUB 144 Oil Filled Voltage Transformers  
SUB 145 Current Transformers  
SUB 146 Unused  
SUB 147 Unused  
**SUB 148 Switchgear**  
SUB 149 158 Spares  
SUB 190 Telecommunication Structure Design & Analysis  
SUB 191 Substation Physical Hardening Protection  
**SUB 192 Dynamic VAR Compensation**  
SUB 193 158 Spares  
SUB 199 Unused

Revision History

Rev 0 - Original Index Posted 11/14/05  
Rev 1 - Changes to Section 133, 126, 128, 130, 135, 137, 138, 139, 140, 141, 144, 145  
Rev 2 - Added Section 108 8/12/2007  
Rev 3 - Added Sub for all Mixed Conductor and Trench Systems to 134 10/22/2007  
Rev 4 - Changed title of SUB 133 from "Fencing" to "Chain Link Perimeter Fence"  
Rev 5 - Changed title of SUB 137 from "Emergency" to "Backup"  
Rev 6 - Changed Font to Gray on unposted Standards, Updated Header & Footer.  
Rev 7 - Added Subheader SUB 117 11/09/2018  
Rev 8 - Added (activated) SUB 192 01/09/2019



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<b>Key:</b>	
SUB 000	Approved
SUB 000	Under Development
<hr/>	
SUB 201	Index
SUB 202	Eversource Substation Equipment Acceptance Testing Guidelines
SUB 203	Unused
SUB 204	Unused
SUB 205	Unused
SUB 206	Unused
SUB 207	Unused
SUB 208	Substation Safety and Nomenclature Signs (Refer to TD 189)
SUB 209	Unused
SUB 210	Site Development
SUB 211	Unused
SUB 212	Concrete Foundations
SUB 213	Wiring Separation
SUB 214	Grounding
SUB 215	Chain Link Perimeter Fence
SUB 216	Structures
SUB 217	Bus, Insulators and Fittings
SUB 218	Disconnect Switches
SUB 219	Outdoor Lighting
SUB 220	Cables
SUB 221	Capacitor Banks
SUB 222	Control Enclosure
SUB 223	Unused
SUB 224	Power Transformers, Reactors, Line Traps
SUB 225	Circuit Breakers, Circuit Switchers
SUB 226	Communication Systems
SUB 227	Unused
SUB 228	Metering
SUB 229	Protective Relaying
SUB 230	Switchboard Devices & Event Recording
SUB 231	Unused
SUB 232	Unused
SUB 233	Unused
SUB 234	Duct Banks
SUB 235	SCADA Systems
SUB 236	Unused
SUB 237	Backup Generator & Accessories
SUB 238	DC Battery & Charging System Installation and Testing

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SUB 239 Surge Protection  
SUB 240 Direct Stroke Lightning Protection  
SUB 241 Substation Security  
SUB 242 Unused  
**SUB 243 345-kV Capacitor Voltage Transformers**  
SUB 244 Potential Transformers  
SUB 245 Current Transformers  
SUB 246 Unused  
SUB 247 Unused  
SUB 248 - 289 Spare  
SUB 250 Telecommunication Structure Design & Analysis  
SUB 251 - 258 Spare  
SUB 259 Unused

Revision History

Rev 0 - Original Index Posted 11/18/05  
Rev 1 - Changes to Section 210, 212, 213, 214, 226, 229, 230, 237, 238.  
Rev 2 - Added section 208 5/15/06  
Rev 3 - Added SUB 250 and Moved Conduit and Trench Systems to 234  
Rev 4 - Changed Font to Gray on unposted Standards. Updated Header & Footer  
Rev 5 - Changed Nonused Utilities to EverSource, updated title of SUB 252.

Key:

OTRM 000 Posted  
OTRM 000 Unposted

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OTRM 000 OTRM Design Standards Index  
OTRM 001 Spare  
OTRM 002 Transmission Line Design Process  
OTRM 003 Drawing Numbering System  
OTRM 004 Plan and Profile CAD Requirements  
OTRM 005 Design Considerations for Air Navigation Safety  
OTRM 006 PLS-CADD Design Standards  
OTRM 007 HOLD  
OTRM 008 HOLD  
OTRM 009 Spare  
OTRM 010 NU Standard Structure Types  
OTRM 011 Spacing of Transmission Lines in Rights-of-Way  
OTRM 012 EMF Calculation Protocol  
OTRM 013 Life Cycle Cost Evaluations for CL&P & WMECO  
OTRM 014 – 019 Spare  
OTRM 020 Project Specifications  
OTRM 021 HOLD  
OTRM 022 HOLD  
OTRM 023 Right of Way Encroachments and Uses (Superseded by M7-EN-3003)  
OTRM 024 – 029 Spare  
OTRM 030 Right-of-Way Vegetation Initial Clearance for 115kV, 230-kV,  
and 345kV Transmission Lines  
OTRM 031 Structure Worksite and Access Areas  
OTRM 032 HOLD  
OTRM 033 Spare  
OTRM 034 – 049 Spare  
OTRM 050 Guidelines for Blasting near Utilities  
OTRM 051 Transmission Line and Substation Terminal Structure & Lightning Mast  
Foundations  
OTRM 052 HOLD  
OTRM 053 – 058 Spare  
OTRM 059 Communication Antennas on Transmission Structures  
OTRM 060 Extreme Wind & Ice Loading on Transmission Line Structures  
OTRM 061 HOLD  
OTRM 062 HOLD  
OTRM 063 Natural Wood Pole Structures  
OTRM 064 Structure Grounding and Counterpoise  
OTRM 065 Lightning Arresters  
OTRM 066 Transmission Line Terminal Structures

OTRM 067 Overhead to Underground Transition Structures (69/115kV only)  
OTRM 068 HOLD  
OTRM 069 HOLD  
OTRM 070 Wire Sizes, Design Tensions and Deadends, Modeling of Wires & Cables  
OTRM 071 Fiber Optic OPGW, ADSS, & Shield Wire  
OTRM 072 Mitigation of Wind Induced Conductor Motion  
OTRM 073 Insulators and Devices  
OTRM 074 Transmission Phase Designaton  
OTRM 075 Overhead Transmission Line Ampacity and Thermal Ratings  
OTRM 076 Conductor Shielding  
OTRM 077 Clearance of 69kV, 115kV, 345kV Conductor to Ground & Other Facilities  
OTRM 078 Conductor Clearances within the Supporting Structure (115kV & 345kV)  
OTRM 079 AM Radio Noise Consideration – 345-kV Conductor Corona  
OTRM 080 Audible Noise Guide  
OTRM 081 Evaluation of Stationary Conducting Objects in ROW  
OTRM 082 AC Interference Studies

Revision History

Rev 0 -- Original Index Posted 11/22/05  
Rev 1 -- Several Additions to Index 8/4/06.  
Rev 2 -- Changes to Sections 10 thru 13 11/17/06  
Rev 3 -- Upgraded and Changed Index Layout 3/01/2007  
Rev 4 -- Changed OTRM 006 from Aerial Laser Survey Criteria to PLS-CADD Design Standards. Also changed approved from RLO to KMS 1/22/2008  
Rev 5 -- Revised title of OTRM 070 to include "Deadends" 1/28/2008  
Rev 6 -- Revised title of OTRM 064 slightly 1/29/2008  
Rev 7 -- Added 070.1  
Rev 8 -- Changed Font to Gray on unused Standards, Updated Header & Footer  
Rev 9 -- Changed Northeast Utilities to Eversource; changed series numbers in use from Spare to HOLD 07/13/2016  
Rev 10 -- Updated title of OTRM 011 03/13/2018

Key:

**OTRM 000** Posted  
OTRM 000 Unposted

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OTRM 100 OTRM Procurement Standards Index  
OTRM 101 Spare  
OTRM 102 HOLD  
OTRM 103 HOLD  
OTRM 104 HOLD  
OTRM 105 Unused  
**OTRM 106** LiDAR Acquisition Requirements and Feature Codes  
**OTRM 107** Property Survey  
**OTRM 108** Engineering/Design Survey  
OTRM 109 Spare  
**OTRM 110** Wood and Steel Structures Material Matrix  
OTRM 111 HOLD  
OTRM 112 HOLD  
OTRM 113 HOLD  
OTRM 114 – 119 Spare  
OTRM 120 HOLD  
OTRM 121 HOLD  
OTRM 122 HOLD  
OTRM 123 Unused  
OTRM 124 – 129 Spare  
OTRM 130 HOLD  
OTRM 131 HOLD  
OTRM 132 HOLD  
OTRM 133 Spare  
OTRM 134 – 149 Spare  
OTRM 150 HOLD  
OTRM 151 HOLD  
**OTRM 152** Soil Boring and Testing Requirements OH Transmission Facilities  
OTRM 153 – 158 Spare  
OTRM 159 HOLD  
**OTRM 160** Technical Requirements for Steel Pole Structures  
**OTRM 161** Technical Requirements for Lattice Steel Structures  
**OTRM 162** Glue-Laminated Wood Transmission Structures  
**OTRM 163** Natural Wood Pole Transmission Structures  
**OTRM 164** Resistance and Resistivity Measurements  
OTRM 165 HOLD  
OTRM 166 HOLD  
OTRM 167 HOLD  
OTRM 168 HOLD

OTRM 169 HOLD  
OTRM 170 HOLD  
OTRM 171 Technical Requirements for Composite Optical Ground Wire  
OTRM 172 HOLD  
~~OTRM 173 Specification for 115 kV Polymer (NCI) Insulators (Cancelled- NCI use  
banned)~~  
OTRM 174 HOLD  
OTRM 175 HOLD  
OTRM 176 HOLD  
OTRM 177 HOLD  
OTRM 178 HOLD  
OTRM 179 AM Radio Broadcast Frequency Signal Strength Measurements along  
Proposed EHV Rights-Of-Way  
OTRM 180 HOLD  
OTRM 181 HOLD  
OTRM 182 HOLD  
OTRM 183 - 189 Spare  
OTRM 190 UAS, Survey Inspection, and Photography of Transmission Lines  
OTRM 191 - 197 Spare  
OTRM 198 Inspection and Supplemental Treatment of Transmission Wood Poles  
(formerly OTRM 268)  
OTRM 199 Inspection and Supplemental Treatment of Transmission Steel Structures

Revision History

Rev. 0 – Original Index Posted 11/22/05.  
Rev. 1 – Several Additions to Index 8/24/06.  
Rev. 2 – Revised Index Layout and Added 152 8/1/07.  
Rev. 3 – Added 107 & 108  
Rev. 4 – Changed Font to Gray on unposted Standards. Updated Header & Footer. 7/23/08  
Rev. 5 – Unknown changes  
Rev. 6 – Changed Northeast Utilities to Eversource; changed series numbers in use from Spare to HOLD 07/13/2016  
Rev. 7 – Updated title of OTRM 152 05/14/2018  
Rev. 8 – Added OTRM 190 and OTRM 199 5/31/18  
Rev. 9 – Added OTRM 198 6/14/18

Key:

OTRM 000 Posted  
OTRM 000 Unposted

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OTRM 200 Index  
OTRM 201 Spare  
OTRM 202 HOLD  
OTRM 203 HOLD  
OTRM 204 HOLD  
OTRM 205 Unused  
OTRM 206 Construction Staking and As-Built Surveying Requirements  
OTRM 207 HOLD  
OTRM 208 HOLD  
OTRM 209 Spare  
OTRM 210 HOLD  
OTRM 211 HOLD  
OTRM 212 HOLD  
OTRM 213 HOLD  
OTRM 214 – 219 Spare  
OTRM 220 HOLD  
OTRM 221 Transmission Line Construction - General  
OTRM 222 Operation of Equipment on Eversource Rights-of-Way  
OTRM 223 Unused  
OTRM 224 – 229 Spare  
OTRM 230 Vegetation Clearing Procedures and Practices for Transmission Line  
Sections  
OTRM 231 Access Roads and Structure Work Site  
OTRM 232 Identification and Warning Signs  
OTRM 233 Spare  
OTRM 234 – 249 Spare  
OTRM 250 Drilling and Blasting  
OTRM 251 Transmission Line, Substation Terminal Structure, and Lightning Mast  
Foundations  
OTRM 252 HOLD  
OTRM 253 – 258 Spare  
OTRM 259 HOLD  
OTRM 260 Steel Pole Installation  
OTRM 261 Transmission Line Steel Lattice Towers  
OTRM 262 Laminated Wood Pole Structure Construction  
OTRM 263 Wood Pole Structures  
OTRM 264 Counterpoise Installation General Specification  
OTRM 265 HOLD  
OTRM 266 HOLD

OTRM 267 HOLD  
~~OTRM 268 Inspection and Supplemental Treatment of Transmission Wood Poles  
(RENUMBERED OTRM 198)~~  
~~OTRM 269 Inspection and Supplemental Treatment of Transmission Steel Structures  
(RENUMBERED OTRM 199)~~  
**OTRM 270 Overhead Conductor Wire Sizes & Design Tension**  
OTRM 271 HOLD  
OTRM 272 HOLD  
OTRM 273 HOLD  
OTRM 274 HOLD  
OTRM 275 HOLD  
OTRM 276 HOLD  
OTRM 277 HOLD  
OTRM 278 HOLD  
OTRM 279 HOLD  
OTRM 280 HOLD  
OTRM 281 HOLD  
OTRM 282 HOLD  
OTRM 283 - 299 Spare

Revision History

Rev. 0 – Original Index Posted 11/22/05.  
Rev. 1 – Several Additions to Index 8/24/06.  
Rev. 2 – Deleted OTRM 229 (Best Management Practices) 8/24/06.  
Rev. 3 – Updated and changed Index Layout 3/01/2007  
Rev. 4 – Updated Font to Gray on unposted Standards. Updated Header & Footer. 7/23/08.  
Rev. 5 – Changed number from OTRM 201 to 200. Verified Standard Titles. Removed OTRM 281. 4/3/2009  
Rev. 6 – Updated title of OTRM 251  
Rev. 7 – Changed series numbers in use from Spare to HOLD 07/13/2016  
Rev. 8 – Added OTRM 268 and OTRM 269  
Rev. 9 – Updated title of OTRM 222  
Rev. 10 – Removed OTRM 269, which was renumbered OTRM 199  
Rev. 11 - Removed OTRM 268, which was renumbered OTRM 198



Key:

UTRM 000 Posted  
UTRM 000 Unposted

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UTRM 000	UTRM Design Standards Index
UTRM 001	Cross Reference to OTRM Standards
UTRM 002	Transmission Safety and Environmental Design Considerations
UTRM 003	Spare
UTRM 004	Spare
UTRM 005	Spare
UTRM 006	Spare
UTRM 007	Spare
UTRM 008	Spare
UTRM 009	Cable Thermal Ratings
UTRM 010	Spare
UTRM 011	Spare
UTRM 012	Spare
UTRM 013	Unused
UTRM 014	Spare
UTRM 015	Spare
UTRM 016	Power Cable Structures and Bridge Attachments
UTRM 017	Spare
UTRM 018	Spare
UTRM 019	Spare
UTRM 020	Unused
UTRM 021	Spare
UTRM 022	Unused
UTRM 023	Spare
UTRM 024	Spare
UTRM 025	Spare
UTRM 026	Spare
UTRM 027	Spare
UTRM 028	Spare
UTRM 029	Spare
UTRM 030	Spare
UTRM 031	Spare
UTRM 032	Spare
UTRM 033	Spare
UTRM 034	Unused
UTRM 035	Unused
UTRM 036	Unused
UTRM 037	Unused
UTRM 038	Spare

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UTRM 039 Spare  
UTRM 040 Spare  
UTRM 041 Spare  
UTRM 042 Spare  
UTRM 043 Spare  
UTRM 044 Spare  
UTRM 045 Spare  
UTRM 046 Spare  
UTRM 047 Spare  
UTRM 048 Spare  
UTRM 049 Spare  
UTRM 050 Drilling and Blasting (Refer to OTRM 050)  
UTRM 051 Unused  
UTRM 052 Unused  
UTRM 053 Spare  
UTRM 054 Spare  
UTRM 055 Spare  
UTRM 056 Spare  
UTRM 057 Spare  
UTRM 058 Spare  
UTRM 059 Spare  
UTRM 060 Spare  
UTRM 061 Spare  
UTRM 062 Spare  
UTRM 063 Spare  
**UTRM 064 Sheath Bonding and Grounding**  
UTRM 065 Spare  
**UTRM 066 Termination Structures**  
UTRM 067 Spare  
UTRM 068 Spare  
UTRM 069 Spare  
UTRM 070 Unused  
**UTRM 071 Cable – Fiber Optic**  
UTRM 072 Unused  
UTRM 073 Spare  
UTRM 074 Phasing (Refer to OTRM 074)  
**UTRM 075 Cable Thermal Ratings**  
UTRM 076 Spare  
**UTRM 077 Clearance Requirements**  
UTRM 078 Spare  
UTRM 079 Unused  
UTRM 080 - 091 Spare  
UTRM 092 Pre-cast Concrete Splice Vaults (refer to UTRM 192)  
UTRM 093 – 099 Spare



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<u>Key</u>	
UTRM 000	Posted
UTRM 000	Unposted
<hr/>	
UTRM 100	UTRM Procurement Standards Index
UTRM 101	Cross Reference to other Applicable Standards
UTRM 102	Unused
UTRM 103	003 Spare
UTRM 109	Thermal Sand
UTRM 110	Fluidized Thermal Backfill (FTB™)
UTRM 111	Spare
UTRM 112	Spare
UTRM 113	HPFF Pipe and Accessories
UTRM 114	114 Spare
UTRM 120	Cathodic Protection
UTRM 121	Spare
UTRM 122	Factory Fabricated Pressurization Plant for HPFF Cable
UTRM 123	Spare
UTRM 124	Spare
UTRM 125	Spare
UTRM 126	Spare
UTRM 127	Spare
UTRM 128	Spare
UTRM 129	Spare
UTRM 130	Spare
UTRM 131	Spare
UTRM 132	Spare
UTRM 133	Spare
UTRM 134	Unused
UTRM 135	Unused
UTRM 136	Unused
UTRM 137	Unused
UTRM 138	Spare
UTRM 139	Spare
UTRM 140	Spare
UTRM 141	Spare
UTRM 142	Spare
UTRM 143	Spare
UTRM 144	Spare
UTRM 145	Spare
UTRM 146	Spare
UTRM 147	Spare
UTRM 148	Spare

UTRM 149 Spare  
UTRM 150 Unused  
UTRM 151 Unused  
**UTRM 152 Soil Boring and Testing Requirements UG Transmission Lines**  
UTRM 153 Spare  
UTRM 154 Spare  
UTRM 155 Spare  
UTRM 156 Spare  
UTRM 157 Spare  
UTRM 158 Spare  
UTRM 159 Spare  
UTRM 160 Spare  
UTRM 161 Spare  
UTRM 162 Spare  
UTRM 163 Spare  
UTRM 164 Unused  
UTRM 165 Spare  
UTRM 166 Unused  
UTRM 167 Spare  
UTRM 168 Spare  
UTRM 169 Spare  
**UTRM 170 Cable – XLPE, EPR, HPFF**  
UTRM 171 Unused  
**UTRM 172 Thermocouple Temperature Monitoring System**  
**UTRM 173 XLPE Cable Support and Restraint System**  
UTRM 174 Unused  
**UTRM 175 Terminations – XLPE, EPR, HPFF**  
UTRM 176 Spare  
UTRM 177 Unused  
UTRM 178 Spare  
**UTRM 179 Underground Cable Splices**  
UTRM 180 – 191 Spare  
**UTRM 192 Pre-cast Concrete Splice Vaults**  
UTRM 193 – 199 Spare

Revision History:

Rev. 0 – Original Index Posted  
Rev. 1 – Changed Font to Gray on unposted Standards. Updated Header & Footer.  
Rev. 2 – Changed from UTRM 101 ot UTRM 100. Updated Standards Titles

Key:

UTRM 000 Posted  
UTRM 000 Unposted

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UTRM 200 UTRM Construction Standards Index  
UTRM 201 Cross Reference to other Applicable Standards  
UTRM 202 Transmission Safety and Environmental Construction Considerations  
UTRM 203 Spare  
UTRM 204 Spare  
UTRM 205 Spare  
UTRM 206 Spare  
UTRM 207 Spare  
UTRM 208 Spare  
UTRM 209 Unused  
UTRM 210 Spare  
UTRM 211 Spare  
UTRM 212 Spare  
UTRM 213 HPFF Pipe and Accessories Installation  
UTRM 214 Spare  
UTRM 215 Spare  
UTRM 216 Spare  
UTRM 217 Spare  
UTRM 218 Spare  
UTRM 219 Spare  
UTRM 220 Unused  
UTRM 221 Spare  
UTRM 222 Pressurization Plant Installation  
UTRM 223 Spare  
UTRM 224 Spare  
UTRM 225 Spare  
UTRM 226 Spare  
UTRM 227 Spare  
UTRM 228 Spare  
UTRM 229 Spare  
UTRM 230 Spare  
UTRM 231 Spare  
UTRM 232 Spare  
UTRM 233 Spare  
UTRM 234 Duct Bank Construction  
UTRM 235 Conduit Material and Installation  
UTRM 236 Marking of Underground Cable Systems in Rights-of-Way  
UTRM 237 Post Construction Duct and Pipe Cleaning and Inspection  
UTRM 238 Spare

UTRM 239 Spare  
UTRM 240 Spare  
UTRM 241 Spare  
UTRM 242 Spare  
UTRM 243 Spare  
UTRM 244 Spare  
UTRM 245 Spare  
UTRM 246 Spare  
UTRM 247 Spare  
UTRM 248 Spare  
UTRM 249 Spare  
UTRM 250 Drilling and Blasting (Refer to OTRM 250)  
UTRM 251 Horizontal Directional Drilling  
UTRM 252 Pipe Jacking and Boring  
UTRM 253 Spare  
UTRM 254 Spare  
UTRM 255 Spare  
UTRM 256 Spare  
UTRM 257 Spare  
UTRM 258 Spare  
UTRM 259 Spare  
UTRM 260 Spare  
UTRM 261 Spare  
UTRM 262 Spare  
UTRM 263 Spare  
UTRM 264 Unused  
UTRM 265 Spare  
UTRM 266 Unused  
UTRM 267 Spare  
UTRM 268 Spare  
UTRM 269 Spare  
**UTRM 270 Cable – XLPE, EPR, HPFF**  
**UTRM 271 Temperature Monitoring and Communication Cable Installation**  
**UTRM 272 Temperature Monitoring Thermocouple Installation**  
UTRM 273 Spare  
UTRM 274 Unused  
UTRM 275 Unused  
UTRM 276 Spare  
UTRM 277 Unused  
UTRM 278 Spare  
UTRM 279 Unused  
UTRM 280 291 Spare  
**UTRM 292 Precast Concrete Vault Installation**  
**UTRM 292.1 Retrofit of Concrete Splice Vault with Round Frame and Cover**

UTRM 293 – 299 Spare

Revision History

Rev 0 – Original Index Posted 12/19/05  
Rev 1 – Additions to Index Section Descriptions 11/03/2006  
Rev 2 – Added UTRM 234 & 235  
Rev 3 – Changed Font to Gray on unposted Standards. Updated Header and Footer  
Rev 4 – Changed from UTRM 201 to 200. Updated Standards Titles.  
Rev 5 – Added UTRM 292.1



**Northeast Utilities  
Real Estate Standards**

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Key:

REAL 000 Posted  
REAL 000 Unposted

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REAL 000 Index  
REAL 001 Property Disposition Checklist  
REAL 002 Real Estate Revenue Lease/License Procedure  
REAL 003 Surplus Property Review  
REAL 004 Corporate Approval To Divest Of Real Estate

Revision History

Index			
Northeast Utilities Approved by: KMS	Real Estate	REAL 001	Rev 0
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# Underground & URD Distribution

## Construction Standards

- 00 – General
- 32 – Cables
- 33 – Connectors
- 35 – Metering
- 36 – Distributed Generation
- 42 – Clearances
- 43 – Tagging / Identification / Labeling
- 54 – Secondary / Service
- 56 – Grounds / Bonds
- 58 – Transformers
- 60 – Switchgear / Switches

[UG DTR Locator](#)

[Search](#)

## Construction Standards

- 61 – Controls / Sensing / Communication
- 62 – Fault Indicators / Fuses
- 63 – Foundations / Box Pads / Handholes
- 64 – Joints / Splices / Tubing
- 65 – Miscellaneous Equipment / Tools
- 66 – Special Projects
- 67 – Terminations
  - Risers
- 76 – Manholes / Vaults / Conduits / Ducts
- 84 – Network / Conventional

Common Abbreviations:

By Name

By Abbreviation

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## Work Method Categories

### Operation & Maintenance of Equipment & Material

- Overhead (01 – 25)
- Substation & Transmission (51 – 75)
- Underground (26 – 50)

Description: These categories cover control box functionality, switch/ reclosure operation, breaker maintenance and testing, pad-mount equipment operation.

### Procedures and Tools

- Material Handling, Tool Operation, Phasing, Safety, Shared Practices, Voltage Testing, Work Site Setup, etc. (76 – 100)

Description: "Procedures and Tools" cover procedures and processes that can be used system wide (OH, UG, Stations, etc.) as well as how to use and operate specific tools.

WMS Locator

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**EVERSOURCE**  
Changes / Additions

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## Overhead Work Methods

### Overhead Equipment & Material

01 – Other, OH  
02 – Anchoring & Guying  
03 – Capacitors  
04 – Connectors  
05 – Cutouts, Fuses, Switches, &  
Sectionalizers  
06 – Insulators, Arrestors & Fault Indicators

### Overhead Equipment & Material

07 – Lighting  
08 – Pole, Hardware & Inspections  
09 – Reclosers, Pole-Top  
10 – Regulators  
11 – Transformers, Pole-Top



Common Abbreviations:  
By Name  
By Abbreviation

**EVERSURCE**  
Changes / Additions

Docket DE 20-161  
Data Request DOE 6-003  
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Attachment DOE 6-003(b)  
Page 47 of 49

## Underground Work Methods

### Underground Equipment & Material

26 – Other, Pad-mounted & UG  
27 – Joints, Splices & Terminations  
28 – Transformers, Pad-mounted & UG  
29 – Switches & Switchgear  
30 – Reclosers, Pad-mounted

### Underground Equipment & Material

56 – Network Protectors  
58 – Secondary & Tertiary Network  
Operations  
59 – Sectionalizers & Switches  
60 – Transformers (Power)

Note: The above categories are from  
the "Substation & Transmission" index  
page. All "Back to Index" buttons will  
link to the Substation index.



Common Abbreviations:  
By Name  
By Abbreviation

**EVERSOURCE**  
Changes / Additions

Docket DE 20-161  
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## Substation Work Methods

### Substation & Transmission Equipment & Material

51 – Other, Substation  
52 – Other, Transmission  
53 – Cables & Conductors  
54 – Circuit Breakers  
55 – Individual & Mobile Substation  
56 – Network Protectors

### Substation & Transmission Equipment & Material

57 – Relays, CT's & PT's  
58 – Secondary & Tertiary Network Operations  
59 – Sectionalizers & Switches  
60 – Transformers (Power)  
61 – Batteries and Battery Banks



Common Abbreviations:  
By Name  
By Abbreviation

**EVERSOURCE**  
Changes / Additions

Docket DE 20-161  
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Procedures & Tools

76 – General / Other  
77 – Other, Overhead  
78 – Other, Substation & Transmission  
79 – Other, Underground  
80 – Battery Operated Tools  
81 – Cable  
82 – Conduit & Underground Chambers  
83 – Fault Locating  
84 – Hand, Hydraulic & Pneumatic Tools  
85 – Personal Protective Equipment

Procedures & Tools

86 – Preventive Maintenance /  
Inspections, Other (Non-Equipment)  
87 – Rigging, Lifting & Handling  
88 – Safety & OSHA  
89 – Grounding  
90 – Testing & Troubleshooting  
91 – Voltage Testing & Phasing  
92 – Wire – (All Voltages & Types)



Common Abbreviations:  
By Name  
By Abbreviation



**Public Service Company of New Hampshire d/b/a Eversource Energy**  
**Docket No. DE 20-161**

**Date Request Received: February 18, 2022**  
**Data Request No. DOE 4-029**

**Date of Response: March 07, 2022**  
**Page 1 of 2**

**Request from: Department of Energy**

**Witness: Labrecque, Richard C, Freeman, Lavelle A**

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**Request:**

Please define the following for the 3 sets of planning criteria provided in the above Excel spreadsheet, i.e., DOE 4-28.1 Attachment 1:

- a. When each was/is used, including first use.
- b. How each is used and by whom.
- c. How each will be used going forward and by whom, including which is the Company's first choice.
- d. What has been done and planned by the Company to help Staff better understand the need for three sets of criteria, and the potential consequences if the preferred set is not accepted/approved by Staff.

**Response:**

Of the three criteria being compared in DOE 4-28.1 Attachment 1, only two are documents that set System Planning criteria: ED-3002 and the Distribution System Planning Guide (DSPG 2020). The third document being referenced is a system study report that references the criteria in the Distribution System Planning Guide. The following responses compare the use of ED-3002 and the Distribution System Planning Guide.

- a. Of the different documents guiding New Hampshire System Planning design criteria, the first is ED-3002, which was originally issued January 10, 2003. This document was the primary guidance for NH System Planning until SYSPLAN-010 was revised.

SYSPLAN-010 was a criteria document created in 2014. In 2018, the first effort to bring all planning criteria of the different operating companies into one document occurred. The revised SYSPLAN-010 document was adopted by all three states on August 1, 2018 and supersedes ED-3002. However, some specific planning criteria not addressed by SYSPLAN-010 are still applicable from ED-3002.



**Public Service Company of New Hampshire d/b/a Eversource Energy**  
**Docket No. DE 20-161**

**Date Request Received: February 18, 2022**  
**Data Request No. DOE 4-029**

**Date of Response: March 07, 2022**  
**Page 2 of 2**

The Distribution System Planning Guide, adopted September 22, 2020, is today's primary document for system planning criteria, rating, and planning methodology. The DSPG 2020 supersedes SYSPLAN-10 and ED-3002, by extension. However, some specific items not addressed by the DSPG 2020 are still applicable in SYSPLAN-010 and ED-3002.

- b. All documents are used by New Hampshire Distribution System Planning for criteria on how to study the distribution system and ensure system capacity needs are fulfilled, and system voltage remains within limits for base case and contingency scenarios.

ED-3002: Portions not superseded by DSPG 2020 and SYSPLAN-010, used by New Hampshire

SYSPLAN-010: Portions not superseded by DSPG 2020, used by Connecticut, Massachusetts, and New Hampshire

DSPG 2020: Used by Connecticut, Massachusetts, and New Hampshire

- c. The Company's primary distribution system planning criteria document is the Distribution System Planning Guide, released in 2020. Any items not addressed by the DSPG 2020, are supplemented, first by SYSPLAN-010 and then by ED-3002. Based on changing roles and responsibilities, some items are still referenced in SYSPLAN-010 by Transmission Planning and in ED-3002 by Distribution Engineering, until replacement guides/policies can be written.
- d. The new Distribution System Planning Guide was included in the Company's initial filing in this docket. Eversource's initial filing highlighted the implementation of the new DSPG and changes to the criteria were described. Subsequent to the initial filing of the LCIRP, Eversource and Staff discussed the new planning criteria at a technical session. The Eversource response to data request DOE 4-028 provides additional details. Eversource is committed to these new criteria as a means to ensure system reliability under various single contingency events. Customers will be exposed to the risk of prolonged outages if the system is not planned and designed to these criteria.

**Public Service Company of New Hampshire d/b/a Eversource Energy**  
**Docket No. DE 20-161**

**Date Request Received: February 18, 2022**  
**Data Request No. DOE 4-002**

**Date of Response: March 10, 2022**  
**Page 1 of 1**

**Request from: Department of Energy**

**Witness: Hebsch, Jennifer J**

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**Request:**

Please provide a copy of the latest distribution standards for Eversource and any studies or memos supporting any recent changes covering the minimum requirement for Class 2 poles, covered wire, pole construction configuration, etc.

**Response:**

Eversource is providing the following Standards in Attachment DOE 4-002 (1):

- Distribution System Engineering Manual (DSEM)
- Overhead Construction Standards
- Underground Construction Standards

To access the above books, perform the following:

1. Unzip the files to a separate directory
2. Open the file called Standards.pdf
3. This opens the “bookshelf” with the three books in it.
4. Click on the book title which will open the book and allow the user to open the various table of contents and documents.

Additional supporting information is also included:

- Attachment DOE 4-002(2) – Eversource Policy: Use of Steel Poles on Distribution Lines

Note that Eversource is working on a topic-by-topic review to consolidate its standards so that each section identifies enterprise-wide as well as operating company level standards within the section. Some standards apply to certain operating companies while others apply to all operating companies.

# Use of Steel Poles on Distribution Lines



***This policy applies to Eversource NH installations***

## Responsibility

All Engineering and Operations personnel are expected to understand and abide by this policy.

## Policy

New poles installed in Eversource three phase lines in distribution Rights-of-Way are to be direct embedded self-weathering steel poles, class and height to be determined by the Transmission Line Engineering group.

The use of steel poles in other situations such as for single phase lines, jointly owned facilities, or other special situations is by exception only and requires approval from managers or above in Operations and Engineering.

Steel poles shall not be used for service poles.

See the attached Supervisor Briefing Sheet for additional information.

## Revision History

0	Created new policy, effective 10/3/2019	
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## Use of Steel Poles on Distribution Lines

### Steel Pole FAQ (Sabre weathering steel poles)

1. **Are there Eversource standards for steel poles?** Refer to Section 10 of the Overhead book, 9.1--9.4.
2. **Do we build to 200 kV BIL?** Steel Construction in the Distribution ROW is built to 350BIL - Wood construction is built to 200 kV BIL. Consult OH Standards book for correct material.
3. **What do we use for guy attachments? Our current attachment has teeth.** Consult Standards - on angles and dead ends where a guy will be attached, a Tee Plate is used on steel construction (SC:532221). It is flat and will sit flush to the pole.
4. **Can we equipotentially ground on a steel pole? How to ground?** Equipotentially grounding a line is done in almost the same way as a wood pole. The only difference is that you can use a step rung to attach a ground to in lieu of the cluster bracket; however, a cluster bracket is also an acceptable method.
5. **Should caulk guns be purchased - how much caulking is required?** Caulk or RTV is required to seal the drill holes to keep out moisture after a bolt is inserted.
6. **How do you drill holes or work in the air if steps are only on one side?** The preferred method would be to drill the poles on the ground before they are set. Poles now have step rung brackets on three sides above the neutral to assist with drilling and reaching outside phases. To reach outside phases where only one side has steps, a diving board can be utilized or hot stick methods.
7. **Is there a special type of rubber to be used on these poles?** No, the rubber we use on wood poles provides the same insulating value regardless of the material it is covering. Proper inspection of rubber goods and Insulate/Isolate techniques shall be followed when working on steel poles.
8. **Can we glove out of the bucket on an energized steel pole?** Yes, these poles can be worked energized using proper PPE and insulate/isolate methods.
9. **Can the Skylift lift and set steel poles?** The Skylift is limited by weight - use lifting chart on machine to determine if the machine can handle the load. Listed below are the 5 most common size distribution poles and their weight.

Height/Type	Weight
40' Class I	818 lbs.
45' Class I	946 lbs.
50' Class I	1,078 lbs.
45' H1	993 lbs.
50' H1	1,137 lbs.

10. **Who is responsible for setting and working on the steel ROW poles? Can the AWC's ask for help from the Transmission group?** *The AWC's are responsible for all distribution lines in their*

## Use of Steel Poles on Distribution Lines

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area both off-road and road side. If there is a need for an off-road machine, call the Supervisor on-call and the determination will be made whether the Transmission group will be able to assist, or a contractor will be called.

- 11. If an off-road machine is needed for assistance, who takes the lead?** In a non-storm event and the Transmission group is called to an event in the ROW, they will generally send one or two guys with the machine to assist the crew currently working.
- 12. Where are the steps? How many are needed? What is the process for installing the step?** Each work center was issued a cage of steps to use if needed. The number of steps is determined by pole size but generally they require 15-20 depending on application. A PowerPoint Presentation is available showing the installation of the steps - contact your supervisor if you were not shown the PPT.
- 13. What belts are required to climb?** Steel Poles can be climbed with either a climbing belt, a Ladder belt or a harness. *100% fall arrest must be maintained at all times.* When climbing - the best method is to loop the climbing belt or lanyard around a step above you and take a few steps up. Next, take a separate belt or lanyard and loop it around a step above you. Repeat process until you get to your desired location.
- 14. Are we going to be trained on how to climb using 100% fall arrest?** A video will be available on how to climb a steel pole.
- 15. Are we going to be trained in the rapid rail system?** Rapid Rail is a fall arrest system used on Transmission structures. This system is not used on the Distribution system.
- 16. Are these poles set with a strap or chain?** There is no difference between setting a wood pole and steel pole as far as work procedures go.
- 17. Is there a cluster bracket we can use to hang equipment to avoid drilling holes?** Currently there is no approved bracket, holes must be drilled to attach equipment.
- 18. Copper ground wire is exposed at the bottom of the pole, will this get stolen?** Most of the D-ROW system is well off road and the likelihood of this wire being stolen is low. The pole is made of steel and will act as a ground in the event the wire is stolen.
- 19. How do we use the mag drill to drill holes?** Consult the owner's manual that came with the drill to become familiar with it. A video is also being made available to show the operation of the unit on a steel pole.
- 20. Where is pole top equipment mounted on the poles?** Refer to OH standards on the equipment that is being installed. There is no change between wood and steel poles - same measurements will be used.
- 21. How do we perform pole top rescue on these poles?** It is the same method we currently use for wood poles.

Attachment JED/RDW-5 is CONFIDENTIAL. Since the bulk of the information is confidential, this page is a placeholder for Bates 00095-000122 and content has been omitted in its entirety.

**Public Service Company of New Hampshire d/b/a Eversource Energy**  
**Docket No. DE 20-161**

**Date Request Received: April 15, 2022**  
**Data Request No. DOE 5-009**

**Date of Response: April 27, 2022**  
**Page 1 of 1**

**Request from: Department of Energy**

**Witness: Paruta, Marisa B**

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**Request:**

Refer to Eversource's Response to DR DOE 4-016. Please provide any planning studies, calculations, estimates or evaluations of the impact on customers' retail distribution rates (\$ per kWh, \$ per customer-month or any other customer measure used by the Company) if the capital forecast included in Attachment DOE 4-016 Page 3 were completed, implemented and/or constructed by the Company, and the Company were to request recognition of these capital amounts in retail distribution rates at current, approved or expected ROI, depreciation, and customary recovery of taxes, O&M and other expenses. Please provide all supporting workpapers.

**Response:**

See Attachment DOE 5-009 for an illustrative presentation and calculation of the impact on revenue requirements if the capital forecast included in Attachment DOE 4-016, page 3, were completed, implemented and/or constructed by the Company. For purposes of this illustrative presentation, the Company used several assumptions that were based on: (1) historical information, including the capital structure, rate of return, whole life depreciation rates, property tax rates, income tax rates, plant retirements, and sales volume, consistent with the most recently filed Docket No. DE 19-057 2020 Step Adjustment (Step #2) for calendar year 2020 plant in service, approved on July 30, 2021, and the most recent base distribution rate case Settlement Agreement, approved on December 15, 2020, and (2) forecasted assumptions, including accumulated depreciation, that were developed using information available at the time the calculation was compiled.

In addition, the Company has developed a measure of the impact of these capital investments to base distribution rates, and to a typical residential bill. The cumulative incremental revenue requirements of \$54.5 million over the period 2021-2026 (see Attachment DOE 5-009, page 1) if applied to current rates would result in an overall average increase of 0.388 cents/kWh, and would vary on a class basis, as shown in Attachment DOE 5-009, page 7. A typical residential customer using 600 kWh in a month would see an increase of \$5.89, or 4.4% (see Attachment DOE 5-009, page 8).

**ILLUSTRATIVE REVENUE REQUIREMENT**

Line	Description	Year-Ending 12/31/2020 (A)	Year-Ending 12/31/2021 (B)	Year-Ending 12/31/2022	Year-Ending 12/31/2023	Year-Ending 12/31/2024	Year-Ending 12/31/2025	Year-Ending 12/31/2026	Reference
1	Total Utility Plant in Service	\$ 2,345,505,174	\$ 2,451,293,636	\$ 2,556,772,098	\$ 2,663,304,560	\$ 2,770,613,023	\$ 2,878,916,485	\$ 2,994,162,947	Page 2, Line 1
2	Accumulated Provision for Depreciation	633,383,630	678,518,775	727,145,733	774,886,383	831,957,767	892,557,751	954,518,363	Page 2, Line 2
3	Net Utility Plant	<u>\$ 1,712,121,544</u>	<u>\$ 1,772,774,861</u>	<u>\$ 1,829,626,366</u>	<u>\$ 1,888,418,178</u>	<u>\$ 1,938,655,256</u>	<u>\$ 1,986,358,734</u>	<u>\$ 2,039,644,584</u>	Line 1 - Line 2
4	Gross Plant Change (year over year)		\$ 105,788,462	\$ 105,478,462	\$ 106,532,462	\$ 107,308,462	\$ 108,303,462	\$ 115,246,462	Line 1 Current Col. - Line 1 Prior Col.
5	Net Plant Change (year over year)		\$ 60,653,317	\$ 56,851,504	\$ 58,791,812	\$ 50,237,078	\$ 47,703,478	\$ 53,285,851	Line 3 Current Col. - Line 3 Prior Col.
6	Rate of Return		6.87%	6.87%	6.87%	6.87%	6.87%	6.87%	Page 3, Line 8
7	Gross Revenue Conversion Factor		1.37142	1.37142	1.37142	1.37142	1.37142	1.37142	Page 4, Line 7
8	Return		\$ 5,713,974	\$ 5,355,816	\$ 5,538,607	\$ 4,732,690	\$ 4,494,007	\$ 5,019,906	Line 5 x Line 6 x Line 7
9	Depreciation Rate		3.15%	3.15%	3.15%	3.15%	3.15%	3.15%	Page 5, Line 71
10	Depreciation		\$ 1,910,579	\$ 1,790,822	\$ 1,851,942	\$ 1,582,468	\$ 1,502,660	\$ 1,678,504	Line 5 x Line 9
11	Property Tax Rate		2.06%	2.06%	2.06%	2.06%	2.06%	2.06%	Page 6, Line 3
12	Property Taxes		\$ 2,174,903	\$ 2,168,529	\$ 2,190,199	\$ 2,206,152	\$ 2,226,609	\$ 2,369,350	Line 4 x Line 11
13	Total Revenue Requirement		<u>\$ 9,799,456</u>	<u>\$ 9,315,168</u>	<u>\$ 9,580,747</u>	<u>\$ 8,521,310</u>	<u>\$ 8,223,275</u>	<u>\$ 9,067,760</u>	Line 8 + Line 10 + Line 12



**ILLUSTRATIVE DISTRIBUTION PLANT**

Line	Description	Year-Ending 12/31/2020 (A)	Year-Ending 12/31/2021 (B)	Year-Ending 12/31/2022	Year-Ending 12/31/2023	Year-Ending 12/31/2024	Year-Ending 12/31/2025	Year-Ending 12/31/2026	Reference
1	Total Utility Plant In Service	\$ 2,345,505,174	\$ 2,451,293,636	\$ 2,556,772,098	\$ 2,663,304,560	\$ 2,770,613,023	\$ 2,878,916,485	\$ 2,994,162,947	Line 9 below
2	Accumulated Provision for Depreciation	633,383,630	678,518,775	727,145,733	774,886,383	831,957,767	892,557,751	954,518,363	Step 2/Company Forecast
3	Net Utility Plant	<u>\$ 1,712,121,544</u>	<u>\$ 1,772,774,861</u>	<u>\$ 1,829,626,366</u>	<u>\$ 1,888,418,178</u>	<u>\$ 1,938,655,256</u>	<u>\$ 1,986,358,734</u>	<u>\$ 2,039,644,584</u>	Line 1 - Line 2
4	Gross Distribution Plant Change (year over year)		<u>\$ 105,788,462</u>	<u>\$ 105,478,462</u>	<u>\$ 106,532,462</u>	<u>\$ 107,308,462</u>	<u>\$ 108,303,462</u>	<u>\$ 115,246,462</u>	Line 1 Current - Line 1 Prior
5	Net Distribution Plant Change (year over year)		<u>\$ 60,653,317</u>	<u>\$ 56,851,504</u>	<u>\$ 58,791,812</u>	<u>\$ 50,237,078</u>	<u>\$ 47,703,478</u>	<u>\$ 53,285,851</u>	Line 3 Current - Line 3 Prior
6	Beginning Plant Balance	\$ 2,250,917,651	\$ 2,345,505,174	\$ 2,451,293,636	\$ 2,556,772,098	\$ 2,663,304,560	\$ 2,770,613,023	\$ 2,878,916,485	Step 2/Prior Year Line 9
7	Additions	123,141,060	134,342,000	134,032,000	135,086,000	135,862,000	136,857,000	143,800,000	Step 2/Base Capital Forecast
8	Retirements	(28,553,538)	(28,553,538)	(28,553,538)	(28,553,538)	(28,553,538)	(28,553,538)	(28,553,538)	Step 2 Retirements
9	Ending Plant Balance	<u>\$ 2,345,505,174</u>	<u>\$ 2,451,293,636</u>	<u>\$ 2,556,772,098</u>	<u>\$ 2,663,304,560</u>	<u>\$ 2,770,613,023</u>	<u>\$ 2,878,916,485</u>	<u>\$ 2,994,162,947</u>	Line 6 + Line 7 + Line 8

Public Service Company of New Hampshire  
 d/b/a Eversource Energy  
 Docket No. DE 20-161  
 Attachment DOE 5-009  
 Page 3 of 8

**COST OF CAPITAL PER DE 19-057**

Line	Description	Fixed Percentage (A)	Cost (B)	Rate of Return (C) = (A) x (B)	Reference
1	Short-Term Debt	2.44%	2.07%	0.05%	
2	Long-term Debt	43.15%	4.08%	1.76%	
3	Common Equity	54.41%	9.30%	5.06%	
4	Total Capital	100.00%		6.87%	Line 1 + Line 2 + Line 3
5	Weighted Cost of				
6	Debt			1.81%	Line 1 + Line 2
7	Equity			5.06%	Line 3
8	Cost of Capital			6.87%	Line 6 + Line 7

**COMPUTATION OF GROSS REVENUE CONVERSION FACTOR**

Line Description	12/31/2020	12/31/2021	12/31/2022	12/31/2023	12/31/2024	12/31/2025	12/31/2026	Reference
1 Operating revenue percentage	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%	100.000%	
2 Less: New Hampshire corporate business tax	7.700%	7.700%	7.700%	7.700%	7.700%	7.700%	7.700%	
3 Operating revenue percentage after state taxes	92.300%	92.300%	92.300%	92.300%	92.300%	92.300%	92.300%	Line 1 - Line 2
4 Federal income tax rate	21.000%	21.000%	21.000%	21.000%	21.000%	21.000%	21.000%	
5 Federal income tax	19.383%	19.383%	19.383%	19.383%	19.383%	19.383%	19.383%	Line 3 x Line 4
6 Operating income after federal income tax	72.917%	72.917%	72.917%	72.917%	72.917%	72.917%	72.917%	Line 3 - Line 5
7 Gross revenue conversion factor	137.142%	137.142%	137.142%	137.142%	137.142%	137.142%	137.142%	1 / Line 6

Note: Amounts shown above may not add due to rounding.

**SUMMARY OF ESTIMATED SURVIVOR CURVES, NET SALVAGE PERCENT, ORIGINAL COST AND  
 AND CALCULATED ANNUAL AND ACCRUED DEPRECIATION RELATED TO ELECTRIC PLANT AS OF DECEMBER 31, 2018  
 WHOLE LIFE DEPRECIATION - AMR RECOVERY OVER 9 YEARS**

LINE	PLANT ACCOUNT	DESCRIPTION	SURVIVOR CURVE	NET SALVAGE PERCENT	ORIGINAL COST AS OF DECEMBER 31, 2018	CALCULATED ANNUAL ACCRUAL AMOUNT	RATE (G)=(F)/(E)	CALCULATED ACCRUED DEPRECIATION
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
1								
2								
3		<b>ELECTRIC PLANT</b>						
4								
5		<b>INTANGIBLE PLANT</b>						
6								
7	303.00	MISCELLANEOUS INTANGIBLE PLANT	5-SQ	0	18,278,819.53	1,769,835	9.68	14,600,391
8	303.00	MISCELLANEOUS INTANGIBLE PLANT - AMR	5-SQ	0	2,864,448.00	95,483 *	3.33	2,660,846
9	303.20	MISCELLANEOUS INTANGIBLE PLANT - 10 YEAR	10-SQ	0	31,771,797.33	486,807	1.53 **	28,607,554
10								
11		<b>TOTAL INTANGIBLE PLANT</b>			<b>52,915,064.86</b>	<b>2,352,125</b>	<b>4.45</b>	<b>45,868,791</b>
12								
13		<b>DISTRIBUTION PLANT</b>						
14								
15	360.20	LAND AND LAND RIGHTS	75-R4	0	4,123,039.65	54,836	1.33	2,204,822
16	361.00	STRUCTURES AND IMPROVEMENTS	75-R3	(25)	26,387,975.26	438,700	1.66	6,187,652
17	362.00	STATION EQUIPMENT	55-S0.5	(25)	303,092,439.65	6,895,353	2.28	65,238,205
18	362.10	STATION EQUIPMENT - ENERGY MANAGEMENT SYSTEM	25-R2.5	0	3,155,937.71	126,238	4.00	1,015,444
19	364.00	POLES, TOWERS AND FIXTURES	53-R0.5	(90)	303,587,829.37	10,901,646	3.59	110,737,706
20	365.00	OVERHEAD CONDUCTORS AND DEVICES	55-R1	(35)	582,095,624.35	14,302,089	2.46	154,119,837
21	366.00	UNDERGROUND CONDUIT	60-R2	(40)	38,757,668.49	906,154	2.34	9,625,266
22	367.00	UNDERGROUND CONDUCTORS AND DEVICES	54-R1.5	(40)	133,741,822.05	3,463,913	2.59	42,368,714
23	368.00	LINE TRANSFORMERS	40-S0	(2)	262,401,157.73	6,693,270	2.55	73,140,846
24	369.10	OVERHEAD SERVICES	44-R2	(125)	81,721,434.74	4,173,922	5.11	47,501,588
25	369.20	UNDERGROUND SERVICES	55-R1.5	(125)	76,631,011.71	3,138,040	4.10	32,482,673
26	370.00	METERS	18-L1	0	44,821,891.75	2,479,416	5.53	19,961,157
27	370.00	METERS - AMR	18-L1	0	31,614,492.00	2,981,203 *	9.43	5,819,204
28	371.00	INSTALLATION ON CUSTOMERS' PREMISES	17-L0	(50)	6,563,781.88	578,892	8.82	3,082,834
29	373.00	STREET LIGHTING AND SIGNAL SYSTEMS	27-L0	(10)	5,130,537.46	208,813	4.07	2,083,777
30								
31		<b>TOTAL DISTRIBUTION PLANT</b>			<b>1,903,906,643.80</b>	<b>57,342,485</b>	<b>3.01</b>	<b>575,569,725</b>
32								
33		<b>GENERAL PLANT</b>						
34								
35	389.20	LAND AND LAND RIGHTS	65-R4	0	26,976.55	415	1.54	13,692
36	390.00	STRUCTURES AND IMPROVEMENTS	50-S0.5	(10)	84,363,470.03	1,854,713	2.20	20,052,815
37	390.10	STRUCTURES AND IMPROVEMENTS - LEASEHOLD	20-S0.5	0	50,859.53	2,543	5.00	19,095
38	391.10	OFFICE FURNITURE AND EQUIPMENT	20-SQ	0	9,755,154.62	487,758	5.00	4,695,337
39	391.20	OFFICE FURNITURE AND EQUIPMENT - COMPUTER EQUIPM	5-SQ	0	1,672,250.89	243,506	14.56	960,508
40								
41		<b>TRANSPORTATION EQUIPMENT</b>						
42								
43	392.00	OTHER	15-S4	15	30,225.00	1,714	5.67	14,507
44	392.10	CARS	6-L3	15	97,593.41	13,828	14.17	13,479
45	392.20	LIGHT TRUCKS	11-S1	15	8,605,166.97	664,878	7.73	2,087,250
46	392.30	MEDIUM TRUCKS	14-S3	15	2,764,714.96	167,791	6.07	767,426
47	392.40	HEAVY TRUCKS	15-S2.5	15	26,391,434.00	1,496,262	5.67	8,212,511
48	392.50	ROLLING EQUIPMENT	13-L2.5	15	1,321,753.47	86,396	6.54	235,242
49	392.60	TRAILERS	13-L3	15	4,958,571.11	324,117	6.54	1,661,871
50	392.70	ELECTRIC VEHICLE CHARGING STATION	10-R4	0	7,902.10	790	10.00	5,244
51								
52		<b>TOTAL TRANSPORTATION EQUIPMENT</b>			<b>44,177,361.02</b>	<b>2,755,776</b>	<b>6.24</b>	<b>13,597,530</b>
53								
54	393.00	STORES EQUIPMENT	20-SQ	0	3,257,904.89	162,895	5.00	1,109,379
55	394.00	TOOLS, SHOP AND GARAGE EQUIPMENT	25-SQ	0	14,194,677.76	567,787	4.00	4,037,342
56	395.00	LABORATORY EQUIPMENT	20-SQ	0	2,072,746.95	96,633	4.65	1,330,656
57	396.00	POWER OPERATED EQUIPMENT	15-L4	0	159,421.09	10,633	6.67	71,720
58								
59		<b>COMMUNICATION EQUIPMENT</b>						
60								
61	397.10	MICROWAVE	15-SQ	0	5,646,707.11	240,089	4.25	3,854,488
62	397.20	OTHER	15-SQ	0	22,098,802.35	1,279,811	5.79	10,667,691
63	397.30	GPS	5-SQ	0	443,487.30	54,399	12.27	366,151
64								
65		<b>TOTAL COMMUNICATION EQUIPMENT</b>			<b>28,188,996.76</b>	<b>1,574,299</b>	<b>5.58</b>	<b>14,888,330</b>
66								
67	398.00	MISCELLANEOUS EQUIPMENT	20-SQ	0	1,279,168.86	63,958	5.00	658,566
68								
69		<b>TOTAL GENERAL PLANT</b>			<b>189,198,988.95</b>	<b>7,820,716</b>	<b>4.13</b>	<b>61,443,970</b>
70								
71		<b>TOTAL DEPRECIABLE PLANT</b>			<b>2,146,020,697.61</b>	<b>67,515,326</b>	<b>3.15</b>	<b>682,882,486</b>
72								
73		<b>NONDEPRECIABLE PLANT</b>						
74								
75	301.00	ORGANIZATION			45,057.29			
76	360.10	LAND			5,830,013.57			
77	389.10	LAND			4,806,992.04			
78								
79		<b>TOTAL NONDEPRECIABLE PLANT</b>			<b>10,682,062.90</b>			
80								
81		<b>TOTAL ELECTRIC PLANT</b>			<b>2,156,702,760.51</b>	<b>67,515,326</b>		<b>682,882,486</b>
82								
83		* AMR METERS NET BOOK VALUE BEING DEPRECIATED OVER 9 YEARS						
84		** NEW ADDITIONS TO THIS ACCOUNT WILL BE DEPRECIATED USING A 10.00% RATE						
85								
86		Less Transportation Equipment				(2,755,776)		
87		<b>TOTAL ELECTRIC PLANT</b>				<b>64,759,550</b>		

Public Service Company of New Hampshire  
d/b/a Eversource Energy  
Docket No. DE 20-161  
Attachment DOE 5-009  
Page 6 of 8

### PROPERTY TAX RATE CALCULATION

Line	Description	Year-Ended 12/31/2020	Reference
1	Total Distribution Property Taxes	\$ 48,644,096	Step 2 CY 2020 Property Tax expense
2	Gross Distribution Plant In Service	<u>\$ 2,366,075,567</u>	Total Distribution Plant @ 12/31/2020
3	Gross Property Tax Rate	<u>2.06%</u>	Line 1 / Line 2

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**Illustrative Distribution Revenue Allocation**

Current Rate Distribution Revenue	\$ 417,434	Source: Line 55, Column F
Estimated Requirements 2022-2026	\$ 54,508	DOE 5 - 009 P1 Line 13
Proposed Distribution Revenue	\$ 471,942	Line 11 + Line 13
Incremental Increase	\$ 54,508	Line 15 - Line 11
Incremental Change	<b>13.06%</b>	Line 15 / Line 11

	A	B	C = B * Line 19	D = B + C	E	F = E - B	G = F / A	H = E / B
	Test Year 2018 Billed Sales (MWh)	Current Rate Distribution Revenue (Rev \$000)	D Change (Rev \$000)	Distribution Target (Rev \$000)	Proposed Rate Distribution (Rev \$000)	Difference Proposed vs Current (Rev \$000) c/kWh % Chg.		
R	3,144,509	\$ 236,433.4	\$ 30,873.0	\$ 267,306.5	\$ 267,312.5			
R-TOD	462	40.6	5.3	46.0	40.6			
	3,144,971	236,474.1	30,878.3	267,352.4	267,353.2	\$ 30,879.1	0.982	13.06%
R-WH	92,916	4,749.7	620.2	5,369.9	4,749.7			
G-WH	3,379	155.5	20.3	175.8	155.5			
LCS-R	36,777	781.2	102.0	883.2	781.2			
LCS-G	4,510	76.1	9.9	86.0	76.1			
	137,582	5,762.4	752.4	6,514.8	5,762.4	-	0.000	0.00%
G	1,715,822	100,361.8	13,105.0	113,466.9	100,361.8			
G-TOD	856	209.1	27.3	236.4	209.1			
	1,716,678	100,570.9	13,132.4	113,703.3	100,570.9	-	0.000	0.00%
G-SH	5,452	241.7	31.6	273.2	241.7	-	0.000	0.00%
GV	1,665,676	43,396.4	5,666.6	49,063.0	43,396.4	-	0.000	0.00%
LG	1,172,439	22,580.3	2,948.5	25,528.8	22,580.3	-	0.000	0.00%
B-GV	2,778	253.3	33.1	286.3	253.3			
B-LG	80,345	1,564.9	204.3	1,769.3	1,564.9			
	83,123	1,818.2	237.4	2,055.6	1,818.2	-	0.000	0.00%
EOL	11,371	2,149.1	280.6	2,429.7	2,149.1			
OL	17,130	4,441.0	579.9	5,020.9	4,441.1			
	28,501	6,590.2	860.5	7,450.7	6,590.2	0.0	0.000	0.00%
Total Retail	<b>7,954,422</b>	<b>\$ 417,434.1</b>	<b>\$ 54,507.7</b>	<b>\$ 471,941.8</b>	<b>\$ 448,313.2</b>	\$ 30,879.1	0.388	7.40%

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Public Service Company of New Hampshire  
 d/b/a Eversource Energy  
 Docket No. DE 20-161  
 Attachment DOE 5-009  
 Page 8 of 8

**Comparison of Rates Effective March 1, 2022 and Illustrative Rates  
 for Residential Service Rate R**

(A) Effective Date	(B) Charge	(C) Distribution Charge	(D) Transmission Charge	(E) Stranded Cost Recovery Charge	(F) System Benefits Charge	(G) Regulatory Reconciliation Adjustment	(H) Electricity Consumption Tax	(I) Energy Service Charge	(J) Total Rate
March 1, 2022	Customer charge (per month)	\$ 13.81							\$ 13.81
	Charge per kWh	<b>\$ 0.05196</b>	\$ 0.03046	\$ 0.00458	\$ 0.00743	\$ (0.00032)	\$ -	\$ 0.10669	<b>\$ 0.20080</b>
Illustrative	Customer charge (per month)	\$ 13.81							\$ 13.81
	Charge per kWh	<b>\$ 0.06178</b>	\$ 0.03046	\$ 0.00458	\$ 0.00743	\$ (0.00032)	\$ -	\$ 0.10669	<b>\$ 0.21062</b>

**Calculation of 600 kWh monthly bill, by rate component:**

	3/1/2022	Illustrative	\$ Change	% Change in each Component	Change as a % of Total Bill
Distribution	\$ 44.99	\$ 50.88	\$ 5.89	13.1%	4.4%
Transmission	18.28	18.28	-	0.0%	0.0%
Stranded Cost Recovery Charge	2.75	2.75	-	0.0%	0.0%
System Benefits Charge	4.46	4.46	-	0.0%	0.0%
Regulatory Reconciliation Adjutment	(0.19)	(0.19)	-	0.0%	0.0%
Electricity Consumption Tax	-	-	-	0.0%	0.0%
Delivery Service	\$ 70.29	\$ 76.18	\$ 5.89	8.4%	4.4%
Energy Service	64.01	64.01	-	0.0%	0.0%
Total	\$ 134.30	\$ 140.19	\$ 5.89	4.4%	4.4%

Attachment JED/RDW-6 is CONFIDENTIAL. Since the bulk of the information is confidential, this page is a placeholder for Bates 000132-000290 and content has been omitted in its entirety.



**Public Service Company of New Hampshire d/b/a Eversource Energy**  
**Docket No. DE 20-161**

**Date Request Received: April 15, 2022**  
**Data Request No. DOE 5-004**

**Date of Response: April 27, 2022**  
**Page 2 of 2**

**Least Cost Alternative Solution** – the alternative solution with the least cost. As set forth in RSA 378:37, it is New Hampshire’s energy policy that “least cost planning” requires selection of solutions that represent the “lowest reasonable cost” based on consideration of factors other than cost including reliability and diversity of energy sources.

**378:37 New Hampshire Energy Policy.** – The general court declares that it shall be the energy policy of this state to meet the energy needs of the citizens and businesses of the state at the lowest reasonable cost while providing for the reliability and diversity of energy sources; to maximize the use of cost effective energy efficiency and other demand side resources; and to protect the safety and health of the citizens, the physical environment of the state, and the future supplies of resources, with consideration of the financial stability of the state's utilities.

The Company takes these considerations into account when planning the distribution system.

**Best Overall Alternative Solution** – Eversource typically refers to this as the “Preferred Alternative.” This is the alternative with the best combination of electrical performance, cost, future system expandability and feasibility to comprehensively address all of the identified needs in the required timeframe.

Transcript

Interview #: 62

Date: February 01, 2022 – 10:00 am

Interviewer(s): Ron Willoughby, Bob Grant, Joe DeVirgilio

Interviewee: **Rick Labrecque, Manager NH Distribution System Planning (+)  
Manager DER Planning (dual management role)**

**Excerpt Page 4:**

Rick: [00:12:31](#) Whereas if you build a non-PTF chunk of system in say the outskirts of Maine and New Hampshire, and it's really only serving chunks of Maine or New Hampshire, it's not doing anything for the power flows around the grid. They're going to say, "Why should Connecticut and Mass pay for a chunk of that investment?" So they have a different cost recovery mechanism for that.

Bob: [00:13:00](#) Okay. I was just curious. I wasn't sure what that was. Go ahead, Ron.

Ron: [00:13:04](#) The New Hampshire Distribution System Planning Guidelines are actually part of the LCIRP for New Hampshire. Do those guidelines mirror the other two states and then identify the state exceptions or how do those guidelines compare with... Since you're trying to standardize as much as possible. Could you explain that?

Rick: [00:13:31](#) Yep. A couple of years ago there was a 3-state process to harmonize the planning criteria amongst the three states. They looked at existing practices, existing documentation, best practices, and develop this common distribution system planning guide. For the most part it is uniform throughout but there are exceptions in there that are called out if Mass, Connecticut, or New Hampshire has a particular difference. It's signaled in that document.

Ron: [00:14:21](#) Are the DER guidelines part of that or is that a separate document? I'm trying to remember.

Rick: [00:14:30](#) I believe there's a very short paragraph in there about DER. **We are creating our a new DER Planning Guide**, and that's been a long time coming. We're getting closer to the first final draft and it's going to be a living document. I think even more so than the Distribution System Planning Guide that the DER state of the art and criteria and standards and study methodologies are... We've come a long way but there's still new things that new technologies and new study methodologies and tools that haven't fully incorporated yet. So our plan is to get a DER planning guide, finalized, published that'll be 90% of all the good stuff and we'll just revise it as needed.

- Bob:            [00:15:41](#)            When is that expected?
- Rick:           [00:15:45](#)            Maybe by the end of the first quarter (2022). Some will definitely be there in the first half of the year.
- Bob:            [00:15:59](#)            Let me ask you this. I know you're dealing with distribution, but at some point in distribution, you have to integrate your thinking with the transmission and substation folks because of the substations. How does that work from the planning perspective?

Transcript

Interview #: 19

Date: November 16, 2021 – 9:00 am

Interviewer(s): Ron Willoughby, Bob Grant

**Interviewee: Ryan West, Director NH Grid Modernization**

**Excerpt Pages 12 and 15:**

**Page 12:**

Hampshire is to really look at all the use cases. Let's work together here and say, all right, strategically, we want to do all of this. Here's the enabling stuff that we got to get to before we can apply it.

Ron: [00:37:12](#) For the difference between DMS and DERMS, DERMS is like a distribution SCADA, right? I mean, that's like transmission level at the distribution level. Is that DERMS?

Ryan: [00:37:23](#) Yes.

Eric: [00:37:24](#) And then DMS is a step back from that. Am I correct?

Ryan: [00:37:30](#) Yeah. Not necessarily. Let me define it because I know DMS and DERMS in the industry is used all over the place, and it is used all over the place and means different things. So for us, a **DMS** system is initially the core value there is reliability. So we look at it as the logic to automate our distribution devices optimally for restoration. So the FLISR capability (fault location, isolation and service restoration), that core functionality is reliability driven. And that's how we that's why we're implementing DMS and really trying to drive how we can operate the system more efficiently and respond to outages and really continue the improvement of reliability. So the DMS, for us, in our systems it is the GE products, the eCare distribution is the product, the DMS product.

Ryan: [00:38:39](#) It is very closely, I'll call it an integration, but it's essentially in line, we have a GE SCADA system. So it is two separate software tools, but very closely integrated because it is their whole package. So it is, in our realm, we have a SCADA combined T&D SCADA. We'll have the DMS is same package. We do have a separate OMS vendor, the Oracle OMS system. So for DMS, what we're deploying is again, that flow capability, the real time power flow is the basis. And then when we look forward, this is where I mentioned the VVO is an application module that we have to enable in the DMS, in the future. We're not doing that yet, but we want to enable that. And there's other, a contingency analysis tool is

in the DMS suite, but we're not implementing it right now. That's on the roadmap.

Ryan: [00:39:47](#) There's some other advanced applications that the product has that we're working our way toward. And then so for DERMS, we are, I would say, still evaluating the marketplace on DERMS. If you've, I'm sure you've probably attended a conference in the last five years, people, vendors called everything DERMS.

Ron: [00:40:10](#) Yeah.  
Ryan: [00:40:15](#) And so they went from demand response systems to register just demand response to the other side where you've got utility scale

**Page 15:**

Ryan: [00:46:52](#) Not in the DERMS or CVR space, really. Nothing.

Bob: [00:46:59](#) Right. So you still got a dum system.

Ryan: [00:47:03](#) So the distribution automation program that where we... I don't know if you've heard yet or that there's the over 1700 devices on the system. That provides individual phase measurement for voltage currents, megawatts, MVAR. So we get a lot of information. And in an operator, we do have visibility into the power flow from device to device, right? And this is focused on the backbone. So it's on the three phase backbone of the system. And so the DMS, when we get the power flow solving, it gives us that next level all the way out to the ends of the distribution system.

Ron: [00:47:47](#) Now, the DMS. I had a note here that the phase one, I guess it's phase one for New Hampshire's to be completed in 2022. Are my notes correct on that?

Ryan: [00:47:59](#) That is correct, yep. [inaudible 00:47:59] service in 2022, yep.

Ron: [00:48:02](#) When you're doing levels of communication for that DMS, you have the local, let's say if it's a recloser, it can communicate obviously with itself, but it can communicate with other devices on that line. You move up to the substation. That's another level of communication. And then between substations is another level of communication. All those levels of communication, is that what's being implemented now for DMS?

Ryan: [00:48:32](#) Yeah. I'll quickly talk about the communication architecture. The automation strategy, if you will, was intended... When all those devices were deployed, it was intended with the end goal of having a DMS path logic to control them. So we don't have any peer to peer communication between devices in the field. And we also don't do any peer to peer communication of the substations. And that is based on the fact that we didn't want logic happening and then having the DMS come and have its logic to essentially do the same thing. So the communication structure is very much, we have the remote device communicating typically to the base station tower. And then that comes back to our data system. And that data system is processing all the data to present it to the DMS, for it to solve the... Just to have the logic for isolation and restoration current event. Right? So we don't do any of the peer to peer schemes on the distribution side.

Ron: [00:49:58](#) Everything is coming back to one place. Everything on the system is coming back to one place rather than intermediate places.

Ryan: [00:50:05](#) Correct.

**Public Service Company of New Hampshire d/b/a Eversource Energy**  
**Docket No. DE 20-161**

**Date Request Received: February 18, 2022**  
**Data Request No. DOE 4-020**

**Date of Response: March 08, 2022**  
**Page 1 of 1**

**Request from: Department of Energy**

**Witness: WALKER, GERHARD, Freeman, Lavelle A**

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**Request:**

Please provide 2020-2021 NWA solution options for New Hampshire categorized as either accepted or rejected along with the corresponding reasons why (accepted or rejected).

**Response:**

The Company has conducted the full and detailed analysis on the following stations:

- Loudon Station

For Loudon Station, the Company has provided the results of the analysis in report format as part the Company's supplemental filing in this proceeding submitted on March 31, 2021 as Supplemental Appendix A-2.

One project that is in conceptual engineering and another that is in design engineering were both rejected for NWA.

- Monadnock Substation, presently in the design phase, has an asset condition issue with transformer TB40 and substandard station design (no transformer breakers nor high-side circuit switchers) in addition to N-1 contingent capacity limitations. Based on Eversource NWA suitability criteria, asset condition related projects are not typically considered for NWA solutions.
- Dover Substation, presently in the conceptual phase, has asset condition issues at the substation including an oil circuit breaker and electromechanical relays in addition to N-1 contingent capacity limitations of approximately 28.8 MW. A full NWA analysis was not performed since that magnitude of peak load was considered unachievable in the present NWA regulatory environment. In addition, based on Eversource NWA suitability criteria, asset condition related projects are not typically considered for NWA solutions.

All other design violations identified in the 2020-2029 Load Flow Study Report have yet to be studied within local area studies where a detailed NWA screening analysis will be performed to assess the feasibility of the solutions.

Transcript

Interview #: 13

Date: November 17, 2021 – 9:00 am

Interviewer(s): Ron Willoughby, Bob Grant

Interviewee: **Digaunto Chatterjee, VP System Planning**

**Excerpt Pages 6 and 16:**

**Page 6**

Ron: [00:18:09](#) We saw somewhere that you have... I forget the number exactly, somewhere between 400 and 500 installed megawatts for DER in New Hampshire. Is that an accurate number, or is that too high?

Digaunto: [00:18:26](#) That doesn't sound... That sounds too high. 107 is the precise number that is installed, eight megawatts are under construction, so yeah. 115 megawatts.

Ron: [00:18:38](#) And then I also read somewhere... Let me see...

Digaunto: [00:18:43](#) By the way, that's in our footprint. So it could be you have Unitell, and...

Ron: [00:18:46](#) Oh, okay. Okay.

Digaunto: [00:18:52](#) That may be where you're getting 400 MWs.

Ron: [00:18:53](#) It may be because there was a project, a large interconnection project, more than 200 megawatts a single interconnection. That doesn't sound like you guys though, right?

Digaunto: [00:19:03](#) Yeah, no. We will kick them out if they're trying to connect to our distribution system. We'll study them from transmission interconnection system.

Bob: [00:19:14](#) So let me ask this question. With those six sites in mind, how have you changed the distribution system, or some of these going directly to transmission or sub transmission, how have you changed your distribution requirements for them, and what you have to do on your circuit in order to accept them for two-way flow?

Digaunto: [00:19:42](#) First things first, hosting capacity maps have to be published, so just showing DER developers where, how much capacity you actually have to interconnect. That's just step one. So we've been using our Synergi tool for that in Massachusetts and Connecticut, we're about to roll it out in New Hampshire as well, so that's just step one. So you incentivize,



inform DER customers. The other thing, which is a much more complicated, scary topic, we'll get to it.

Digaunto: [00:20:24](#) We've now started to look at non-wires alternative (NWA) as one of the tools in the toolbox for our distribution system upgrades to the extent we have a capacity overload, and you have a large or a number of PDs down at the customer site, we have taken a position that we will consider those behind the meter customer cited PDs, as one of the many solutions to our... Call it feeder reconductoring or adding a new transformer, replacing transformers, so we build a very cutting edge tool (NWA Tool) that synthesizes all of this into one package and informs what is really the least cost, long-term, most cost effective solution, so you shouldn't to do.

**Page 16**

Ron: [00:48:48](#) Okay.

Digaunto: [00:48:49](#) A bulk electric system. High side is 115 kV. In New Hampshire we have high side, but some of these bulk transformers are 345 kV. You have 345 kV to 34.5 kV transformers. That's a bulk transformer, and then a lot of New Hampshire non-bulks are 13.8 kV to 4 kV. 34.5 kV to 13.8 kV. Those are non-bulks.

Ron: [00:49:13](#) So everything on the line, including transformers on the line, that's the distribution engineering folks?

Digaunto: [00:49:19](#) Distribution engineering takes care of that.

Bob: [00:49:23](#) He washes his hands [inaudible 00:49:25].

Ron: [00:49:23](#) Yeah, he quickly did that. Okay.

Bob: [00:49:33](#) I want to drop back because we're taking a whole different path in our 25 pages of questions here.

Ron: [00:49:40](#) It's okay.

Bob: [00:49:40](#) You get the cliff notes, we get the details. I just want to go back and talk a little bit about capital programs.

Digaunto: [00:49:47](#) Yeah.

Bob: [00:49:47](#) Can you explain your role in capital programs?

Digaunto: [00:49:51](#) Sure. So, capital program, broadly speaking, they're... I would say there are five broad categories. They're basic business, the stuff you've just got to do to connect new customers. You've got your grid modernization program and then you've got equipment obsolescence, and then you've got your distribution line work, and then finally distribution station work.

Digaunto: [00:50:22](#) So my role as VP system planning is twofold. It's number one, taking care of my own house. It is the substation projects that come out of system planning, making sure that their justification, their planning criteria violations are deeply grounded in foundational analysis, the rooted solid justification that I can testify in court that they are absolutely necessary. That's number one, making sure all of their system impacts are well grounded, submitted twice in new England for bulk transformers because it touches the transmission system. There's an I39 process, it's basically a... You have to do a transmission impact analysis.

**Public Service Company of New Hampshire d/b/a Eversource Energy**  
**Docket No. DE 20-161**

**Date Request Received: February 18, 2022**  
**Data Request No. DOE 4-001**

**Date of Response: March 11, 2022**  
**Page 1 of 2**

**Request from: Department of Energy**

**Witness: Hebsch, Jennifer J, Johnson, Russel D, Freeman, Lavelle A, Labrecque, Richard C**

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**Request:**

Reference: Eversource's October 1, 2020 Least Cost Integrated Resource Plan ("LCIRP") and the March 31, 2021 Supplement ("Supplement"), including all Attachments (providing various area planning studies, solution selection forms, and project authorization forms.)

- a. Please provide a table that lists each planned project Eversource has identified in its LCIRP (2020) and 2021 Supplement. Please indicate -- in the table-- if the project was the "least cost option." In the table, please list the "alternative options" (to resolve the same issue) and list the costs for the selected solution and each option. Please identify the sections of the 2020 LCIRP and Supplement, by bates numbered page, that reference the project and alternative options.
- b. For each instance where the Company did not choose the least cost option discussed in the area planning studies, solution selection forms, and project authorization forms, please explain in detail why the project was selected. The explanation should be in narrative form, referencing the table.
- c. Please provide supporting documents, including economic analysis and calculations.

**Response:**

The LCIRP (including the Appendices and the Supplemental filing) identifies projects in the following locations:

**Group #1** - Original Filing Appendix K – this is a Grid Needs Assessment that lists numerous line and station projects >\$250K.

**Group #2** - Original Filing Appendix L – provides Solution Selection Forms ("SSFs")/Project Authorization Forms ("PAFs")/Initial Funding Requests ("IFRs") for 6 different projects.

**Group #3** - March Supplement – Appendix C – this is a listing of Proposed Reliability Projects (distribution line reliability) that have been proposed but have not been funded by the 2021 or previous years capital budgets.

**Public Service Company of New Hampshire d/b/a Eversource Energy**  
**Docket No. DE 20-161**

**Date Request Received: February 18, 2022**  
**Data Request No. DOE 4-001**

**Date of Response: March 11, 2022**  
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**Group #4** - March Supplement – Appendix D – contains early versions of the IFRs for 20 System Planning projects that are in early development (SSFs have not been created).

**Group #5** - March Supplement – Appendix E – contains early SSFs for White Lake, Dover, and Monadnock

**Group #6** - March Supplement – Appendix F – contains PAFs for Distribution Line projects in the 2021 Capital Plan.

Response to Parts (a) and (b): Attachment DOE 4-001 provides the requested data for planned projects in Group #2, Group #5, and Group #6, totaling 37 projects.

The projects in Groups #1, #3, and #4 have either not progressed to the planned stage or are duplicates of projects included in Groups #2, #5, or #6.

Response to Part (c): Supporting documentation for these projects (SSFs and PAFs) are included in either the original LCIRP filing or the Supplement. For each project, specific additional supporting documentation is available on request.

Interview #: 16

Date: November 8, 2021 - 12:30 pm

Interviewer(s): Ron Willoughby, Bob Grant

**Interviewee: Russel Johnson, Director NH Distribution Engineering**

**Excerpt Page 6:**

*Well, here's something [00:27:00] we can spend about 20 minutes talking about. I'll start with the definition of what our **hit list worst performing circuit** is up here, which is a contribution to company [SAIDI 00:27:17] measure.*

Their approach here is considered a standard practice, but important to identify potential critical system weaknesses and move to ensuring all customers receive the same reliable service.

*That's the nature of it. And, by the way, it's one year. [00:28:30] It's not a rolling four years. So what tends to happen is that you have perennial circuits that have to be... The 150 mile circuits that are serving 8,000 customers, just because of the exposure they have, are generally in the top 10. But then you have a great deal of volatility just by the fact that it only looks at one year.*

34.5Kv designs allows a utility the opportunity to run very long circuits with less issues of voltage sags. However, by the very fact that the circuits are much longer, they are exposed to more opportunities for interruptions. This is particularly true for radial circuits. The solution if appropriate is to loop the circuit or tie it with another circuit to allow fault isolation, and limit the outage to the impacted line segment, thereby reducing the total number of customers impacted by the outage and reducing the total number of customer minutes out. RCG believes this is what Eversource is trying to accomplish.

*I would have to say it's a consideration, but we're not focused on the top 10. And the reason why is because some of these circuits have been in the top 10 for a decade and [crosstalk 00:29:58] we spent tons of money on [00:30:00] them, addressing specific things. But I'll give you a perfect example was the 31 41 X circuit was always on the hit list because it was a massive circuit that fed somewhere between eight and 9,000 customers with no real backup. So*

*when we put a line from a Kingston, new Kingston substation [00:30:30] and tied it into the end of this and split the circuit in half, it dropped out of the top 10 immediately just because now we had a circuit tie, so you split it in half. And so my point is, is that yes, we're very aware of the circuits that are on the hit list.*

The 31 41X circuit is an example of the long circuit issue we described. And they finally came to the conclusion to split the circuit. These kind of examples