# Safety Division Investigation into Electrical Contact and Fatality with PSNH 3 Phase Distribution System on April 19, 2014 Keene, NH

*September 18, 2015*

## Accident Description:

On Saturday April 19, 2014 at approximately 2:00 p.m., a student called the Keene State College Campus Security and reported a low hanging wire. This was later determined to be a high voltage electric power line. The low wire was located between the NH Route 101 footpath and the walking bridge from Martel Court near the Keene State Athletic Fields.

At 2:22 p.m., the Keene Fire Department notified PSNH of a live low hanging bare conductor that a Keene State maintenance employee, Nathan L. DeMond, possibly made contact with. Mr. DeMond was assisting campus security look for the low hanging wire in response to the student notification to Keene State College. The wire was part of a high voltage primary circuit near the Keene State College Athletic Fields. The area was lightly wooded and contained small areas of brush. Keene Fire Department confirmed that Mr. DeMond made contact with a 7,200 volt rated electrical primary wire and confirmed his death. Mr. DeMond was found with the lower part of the leg in contact with the primary wire, which was approximately 24 inches[1] off the ground. Burn marks on the ground and witness accounts of first responders corroborated the accident. The incident also started a brush fire and caused an electrical power outage impacting approximately 1,065 customers. Electrical service to 1,888 more customers was interrupted when PSNH de-energized the adjoining circuit to make the scene safe to allow crews to make repairs and restore customer service.

Keene State Security, Keene Fire Department and the State Fire Marshall's office responded and investigated the incident. The Safety Division of the Public Utilities Commission was the final investigatory agency involved.

## Environmental Conditions:

At the time of the accident, wind speeds were approximately 4 mph and the temperature was 57.2 degrees Fahrenheit. The temperature that day ranged from 28.4 degrees to 57.2 degrees. The sky was partly cloudy. There was no snow on the ground, but otherwise early spring conditions were present, including moist grass.

## Contributing Factors:

The Safety Division found two contributing factors to the accident and Mr. DeMond's death. First, there was a single low hanging bare electrical conductor that sagged to a level where the public could come into contact with it. The wire was hanging low

[1] Various statements by on scene responders estimated the conductor between 18 inches, 24 inches, and 30 inches off the ground.

because the wooden cross arm assembly that was designed to hold the wire at a safe height had decayed, rotted, and broken.

Second, the Safety Division determined that Mr. DeMond's leg came into contact with the high voltage wire. The contact caused burns on Mr. DeMond's leg and created a path for the electrical current to travel to the ground.

Falling trees, branches, and animal disturbances were not factors in the accident.

## Background Description of the Circuit and Support Structures

## Appendix A Maps

This appendix contains four maps of the area that provide background of the primary circuit and the location of fatality.

### Appendix A1

Appendix A1 is a map showing an overview of where the accident occurred and identifies major landmarks and the various electrical wires in the area, using PSNH's identifiers. The primary function of the 12.47 kv (rated) three phase circuit identified as W185 is to transmit electrical power from the Keene Switching and Distribution Substation to the easterly side of town eventually terminating in Keene at or near the former Marlboro Street Substation (Marlboro Street at Optical Avenue). The W185 circuit is located in a PSNH right of way (ROW) along with 3 other circuits. The three other PSNH designated circuits consisted of two 115 kv rated circuits, the T-198 and A-152 circuits, and another 12.47 kv rated circuit designated W15. The W185 circuit generally runs southerly past Route 101 and easterly branching just north of the Keene State Athletic Fields. The majority of the circuit is located in the PSNH ROW including the segment where the electrocution occurred, which was in an urban ROW that traverses long portion of Keene. A 12.47 kv three phase to phase circuit has a voltage rating of 7.2 kv phase to ground.

### Appendix A2

Appendix A2 is a map that provides more detail of the approximate location of the accident. The fatality occurred west of the Ashuelot River and north of the athletic fields where the 125 foot ROW branches east and only the two 12.47 kv circuits remained, the W185 circuit and the W15 circuit. The accident occurred on the northerly circuit W185. The adjoining W15 circuit parallels the W185.

Appendix A3

Appendix A3 is a photograph that shows detail where the fatality occurred with pole designations and dimensions between poles. Mr. DeMond made contact with the wire approximately 75 feet from the easterly side of Pole 24. As designed, the 370 foot span between Pole 24 and Pole 25 also crosses the Ashuelot River. The path of this segment was approximately 40 feet inside the northern edge of the ROW. The map also shows the 283 foot span between Poles 23 and 24 that crosses a brushy area that is slightly marshy depending upon the season. The broken cross arm was located on Pole 24. Once the wire became detached from Pole 24, the span became 653 feet between Pole 23 and Pole 25. The W15 circuit is located in the same ROW but had no role in the accident; it is shown for reference only.

Appendix A4

Appendix A4 is a diagram that shows a profile view of the sag and distance between the poles for circuit W185. Poles 24 and 25 are 45 feet tall and are typically embedded approximately 6.5 feet into the ground. The wooden Pole 23 is 40 feet long and embedded 6 feet deep, so its elevation from ground level was approximately 34feet high. Thus the elevation to the top of the Pole 24 was approximately 38.5 feet above ground level. The ground elevation was approximately the same throughout both spans. Calculated sags were provided by PSNH but do not correspond well to actual observations, indicating assumptions for conductor tensioning may have differed from field conditions. The purpose Appendix A4 is to illustrate how much the sag can be affected when span lengths are modified because of equipment failures.

## Appendix B Photographs

Appendix B contains photographs taken at the scene including:

(a) those found on Mr. DeMond's camera, taken April 19, 2014;
(b) those taken by the first responders[2] on April 19, 2014;
(c) those taken by PSNH employees on April 19, 2014; and
(d) those taken by the Safety Division on April 21, 2014 both at the location of the accident and at PSNH's Keene area work center. The photos are labeled sets B1, B2, B3 and B4.

[2] First responders for purposes of this report also includes the NH Fire Marshall's Investigation Office

## Appendix C Utility Records

Appendix C contains maintenance records of PSNH's last inspection of Pole 24 on the W185 circuit. Appendix C includes a record apparently documenting a January 15, 2014, inspection of Pole 24 on the W185 circuit. The handwritten notes indicate "broken cross arm," and "1 guy loose & 1 guy broken." Attached to this maintenance record are two photographs of a wooden utility pole.

## Appendix D Public Outreach Safety Training

Appendix D is a copy of the MUST Safety Training presented in Keene on March 19, 2014.

## Appendix E NH Fire Marshall's Official Report

Appendix E is a copy of the New Hampshire Fire Marshall's report, which contains reports of witness interviews and the Marshall's narrative report.

## Installation History

PSNH Data Responses indicate Poles 23, 24 and 25 were installed in 1949 and the 10 foot long x 5 inch x 5 inch wooden cross arms were installed in 1950. The wooden cross arm dimensions are greater than the NESC requirements of Rule 261. The pole design included a double cross arm configuration on each side of the wooden pole supporting three phases of conductors that are separated by an appropriate distance. Single wooden class 3 poles that varied between 40 feet and 45 feet in height were used for the identified poles of W185. Three separate insulators, one per phase, prevented contact with the conductors and the wooden cross arm and wooden pole. The conductor consisted of 4/0 Copper with a 230 ampacity rating. All clearances and height requirements met NESC requirements.

A review of the easement information confirmed that PSNH had in place easements for the land west of the Ashuelot River and east of the Ashuelot River dating back to 1949.

A record research of Commission orders granting licenses for the Ashuelot River in Keene could not find an order granting a license for the span of W185 or W15 that crossed the Ashuelot River. The Ashuelot River is on the State of New Hampshire's list of public waters.[3] See RSA 371:17.

## Maintenance History:

PSNH Maintenance records indicate that Pole 23 was set in 1962, Pole 24 was set in 1969 and Pole 25 was estimated to be set in 1956. PSNH records indicated that "test and treat" maintenance was performed on October 8, 2008 for all three poles near the ground level, which resulted in some of the poles being treated to resist environmental degradation.

PSNH's pole maintenance procedure at the time of accident was known as NUMM (Northeast Utilities Maintenance Manual). The procedure required inspection of poles no less than once every 10 years, and "back bone" circuits needed to have drive-by inspections annually, and can include infrared inspections to determine hot spots.

PSNH last inspected Pole 24 of circuit W185 on January 15, 2014, approximately 94 days prior to the accident. PSNH's inspection records say that on January 15, 2014, Pole 24 had a "broken cross arm," one loose guy wire, and one broken guy wire that supported Pole 24. Photographs included with the documentation indicate that the cross arm was still attached to the pole, but they show the cross arm is broken or partially broken because the outside conductor can be seen sagging lower than the other side of the cross arm. Reference Appendix C.

[3] http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/olpw.pdf

**Code Compliance Issues:**

Puc 306.01(a)(1) requires that "[e]ach utility shall construct, install, operate and maintain its plant, structures and equipment and lines … [i]n accordance with good utility practice." Puc 306.01(b)(1), in turn, defines "good utility practice" to mean "in accordance with the standards established by ... the National Electrical Safety Code C2-2012." The utility must weigh "all factors, including potential delay, cost and safety issues, in such a manner to best accommodate the public."

The National Electrical Safety Code (NESC) states: "All electric equipment shall be constructed, installed, and maintained so as to safeguard personnel as far as practical."

The NESC further requires prompt replacement of defective equipment during Inspections of In-Service Equipment. "Electric equipment shall be inspected and maintained at such intervals as experience has shown to be necessary. Equipment or wiring found to be defective shall be put in good order or permanently disconnected."

The Safety Division finds that PSNH did not repair the broken cross arm on pole 24 in a prompt manner. Timely repair would have avoided the collapse of the insulator and the ensuing sagging of the Phase 1 wire. The cross arm was in imminent danger of complete failure to support the energized primary wire because it was noticeably broken as reported during the inspection on January 15, 2014. It fits the PSNH criteria for replacement because "it was partially decayed across the grain," and/or was a support structure "having a hollow heart with appearances of sound wood." Subsequent inspection of the cross arm by the Safety Division at the local PSNH work center revealed significant decay of the wood. *See* photographs taken by the Safety Division on April 21, 2014, at PSNH's Keene area work center, Appendix B.

**PSNH Emergency Response:**

The Safety Division finds the PSNH Emergency Response Time to be adequate. PSNH was notified at 2:22 pm of an electrical contact and was on scene at 2:37 pm. At the time of arrival, an outage of W185 circuit resulted from the fault. The PUC was notified at 2:50 pm of an electrocution as required by Puc 306.06. The outage was reported as 237,510 customer minutes or approximately 4 hours. The cross arms were replaced and the conductors re-energized. PSNH filed the required ten day and 60 day written reports in accordance with Puc 306.06.

**PSNH Public Electrical Safety Education and Outreach:**

PSNH did not have any records of conducting electrical safety training sessions known as "Fires and Wires" for Keene State College. PSNH provides a training session for municipal departments such as Keene Fire Department approximately every 3 years.

Records indicate that a training session was last given to Cheshire Medical Facility in Keene during February 2013.

A MUST (Managing Underground Safety Training) was held at Keene State College on March 19, 2014 by a collaborative group of utilities[4] (gas/electric/telecom) safety session and focuses on underground damage prevention but also has a segment regarding electrical hazards both above ground and below ground was held. The March 2014 MUST session was attended by twelve Keene State College employees including Mr. DeMond. Unitil Electric Service gave that electrical safety presentation. Reference Appendix D.

[4] This includes PSNH, Unitil, Liberty Utilities and New Hampshire Electric Cooperative.

# Appendix A

**PUC Safety Division**

**Maps of Electrical**

**Accident of**

**April 19, 2014**

**Appendix A 1**

# PSNH Keene Fatality - 4/19/2014

Area Overview - Keene, NH

*Drawn: July 18, 2014*

Prepared By:
NH Public Utilities Commission
Safety Division ; GIS Section

N

Legend

Town Boundary
Stream/Brook
Water Feature
Road
Interstate
NH Route
US Route
Ramp
Driveway
Rail/Rail Bed
Substation
115 kV Line
12.5 kV Line
4.16 kV Line
12.5 kV Line (Underground)

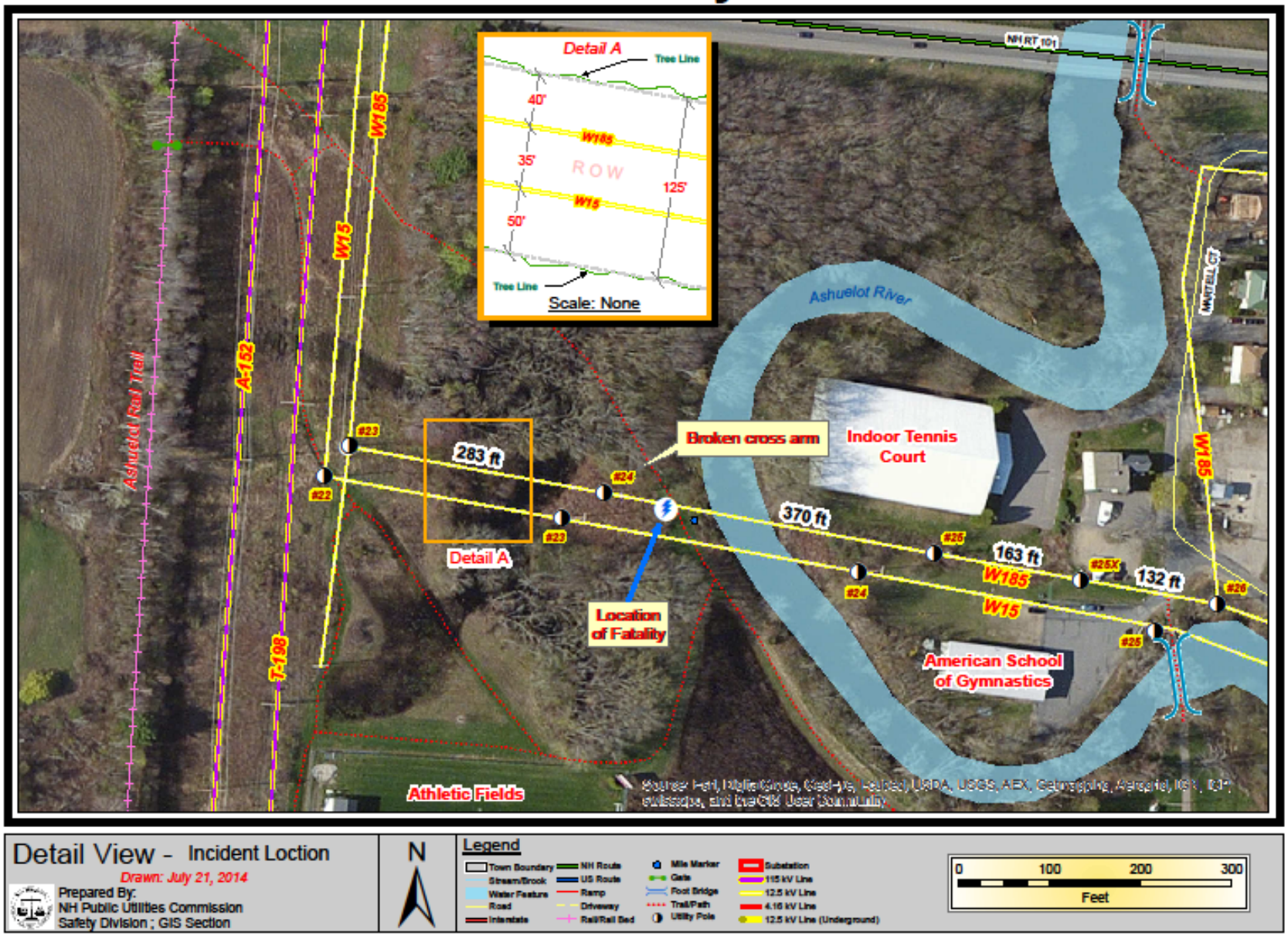
0 250 500 750 1,000
Feet

**Appendix A 2**

# PSNH Keene Fatality - 4/19/2014

**Appendix A 3**

# PSNH Keene Fatality - 4/19/2014




Detail View - Incident Loction

Drawn: July 21, 2014

Prepared By:
NH Public Utilities Commission
Safety Division ; GIS Section

N

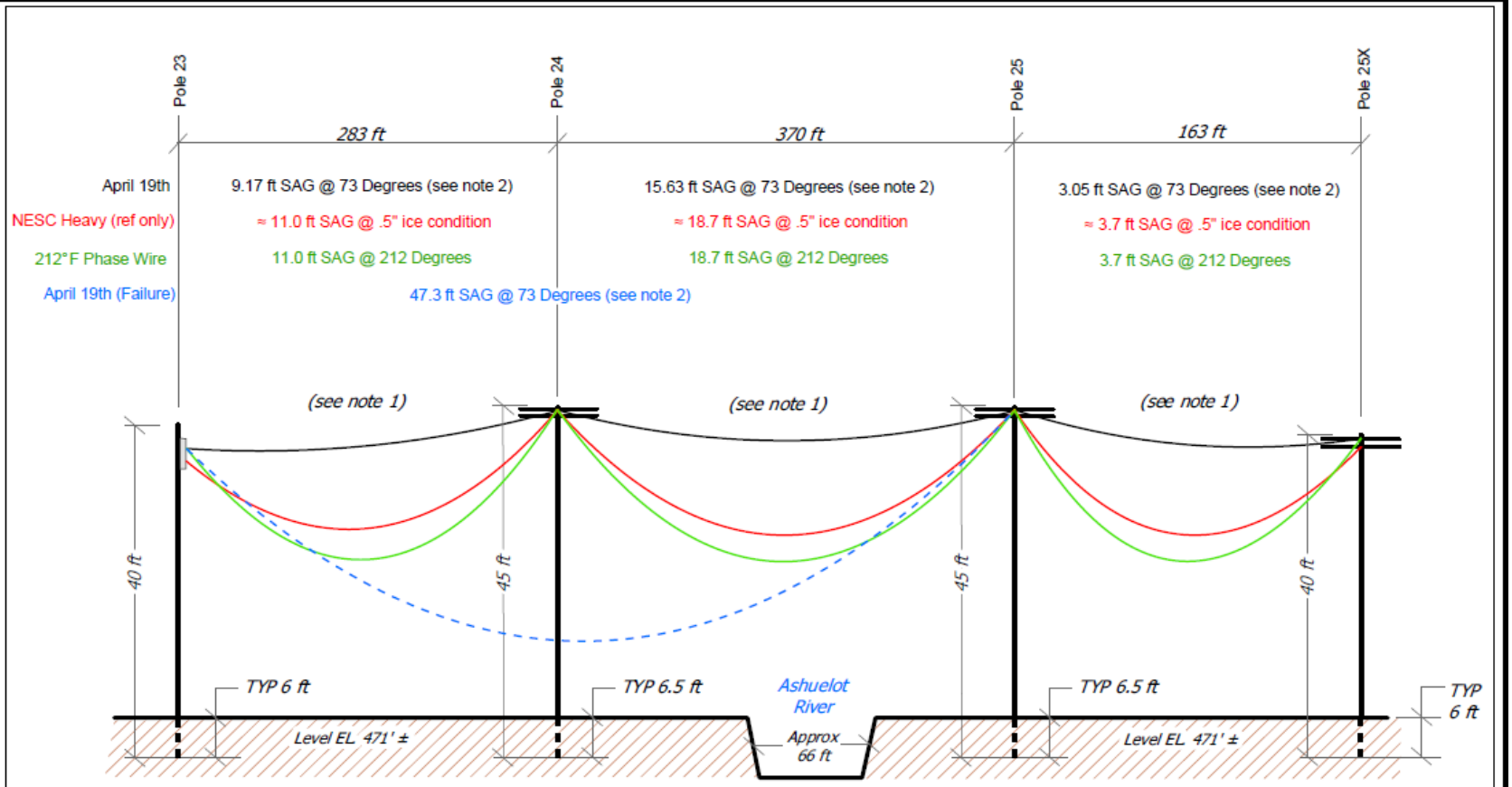
Legend

Town Boundary
Stream/Brook
Water Feature
Road
Interstate
NH Route
US Route
Ramp
Driveway
Rail/Rail Bed
Mile Marker
Gate
Foot Bridge
Trail/Path
Utility Pole
Substation
115 kV Line
12.5 kV Line
4.16 kV Line
12.5 kV Line (Underground)

0 100 200 300
Feet

**Appendix A 4**

# PSNH Keene Fatality - 4/19/2014




Profile View for Phase Wires
- Incident Loction -

Prepared By:
NH Public Utilities Commission
Safety Division ; GIS Section

Notes:
1. Neutral wires not shown - Typ 5 - 6 ft below crossarm.
2. 73 degrees is based on a 57 degree ambient temperature.
3. Data and dimensions were obtained from PSNH report received by the NHPUC

# Appendix B

**April 19, 2014 and April 21, 2014**

**Photo Documentation**

**Electrical Contact PSNH W185 Circuit**

**Keene NH**

## Photo B 1-1

Photo B 1-1 Taken April 19, 2014 prior to electrical contact being made and recovered from deceased's camera. Looking westerly, this is Pole 24 of W185; the broken cross arm is hanging in the air. Phase 1 conductor is missing as well as insulators. Lowest wire is the neutral. Phases 2 and 3 are remain intact. The double cross arm is supported by the metal V shape supports.

## Photo B 1-2

Photo B 1-2 Taken April 19, 2014 prior to electrical contact being made and recovered from deceased's camera. Looking easterly phase 1 conductor of W185 is low to the ground but is above the Ashuelot River. Mile Marker Post of the walking trail is located nearby. The remaining poles of Circuit W185 are shown beyond the river and W 15 is shown to the right. The building to the left is the Indoor Tennis Courts and the building in the rear right is the American School of Gymnastics.

## Photo B 1-3

Photo B-1-3 Taken April 19 2014 prior to electrical contact and recovered from deceased's camera. One can see the green colored conductor 4/0 wire approximately 2 feet above the ground. Photo is looking northerly. Ashuelot River is to the east and PSNH Pole 24 is outside the picture looking west.

## Photo B 2-4

Photo B 2-4 This photo taken on the day of the electrical contact after the Fire Marshal arrived shows the W185 phase 1 conductor is missing from the double crossarm (attached to both sides of poles) that is completely broken and rotted. The conductor and supporting insulator is missing from the photo as it laying near the ground (see Photo B 2-5). *Photo courtesy of NH State Fire Marshal's Office taken April 19 2014*

## Photo B 2-5

Photo B 2- 5 Close up of insulators from W185 phase 1 and portion of cross arm and conductor laying near bottom of pole 24. Insulators still attached to conductor but have completely pulled out from wooden cross arms. Spool of wire used for repair of guy wire is shown at left. *Photo courtesy of NH State Fire Marshal's Office taken April 19 2014*

## Photo B 2-6

Photo B 2-6 Taken day of electrical contact April 19 2014. Looking southerly displaying area of brush fire. *Photo courtesy of NH State Fire Marshal's Office taken April 19 2014*

## Photo B 2-7

Photo B 2-7 Taken day of electrical contact April 19 2014. Looking easterly; displaying area of brushfire. Phase 1 conductor at the ground level. PSNH Work Crew had arrived on seen after contact occurred. Boom Truck is background. Insulators are on ground at base of Pole 24 of W185. Circuit W 15 is shown with all 3 phases intact. *Photo courtesy of NH State Fire Marshal's Office*

## Photo B 2-8

Photo B 2-8 Taken day of electrical contact April 19 2014. Electrical Contact Area near the trail opening between brush area 1 and brush area 2. *Photo courtesy of NH State Fire Marshal's Office taken April 19 2014*

## Photo B 2-9

Photo B 2-9 Taken day of electrical contact April 19 2014. Another view of Electrical Contact Area near the trail opening between brush area 1 and brush area 2. *Photo courtesy of NH State Fire Marshal's Office taken April 19 2014*

## Photo B 2-10

Photo B 2-10 Taken day of electrical contact April 19 2014. Third photo of Electrical Contact Area near the trail opening between brush area 1 and brush area 2 . *Photo courtesy of NH State Fire Marshal's Office taken April 19 2014*

## Photo B 3-11

Photo B 3-11 Taken April 19, 2014 after contact was made. Looking South on the trail area brush area 2 is shown on the left while brush area 1 is on the right. The marker post is shown on the left side. The contact area is in the middle. *Photo provided by Public Service Co of New Hampshire*

## Photo B 3-12

Photo B 3-12 Taken April 19, 2014 after contact was made. Looking North on the trail area brush area 1 is shown on the left while brush area 2 is on the right. The marker post is shown on the right side. The contact area is in the middle. *Photo provided by Public Service Co of New Hampshire*

## Photo B 3-13

Photo B 3-13 Taken April 19, 2014 after contact was made. Looking North on the trail area approaching the contact area. The contact area is in the darker area in the middle. *Photo provided by Public Service Co of New Hampshire*

## Photo B 3-14

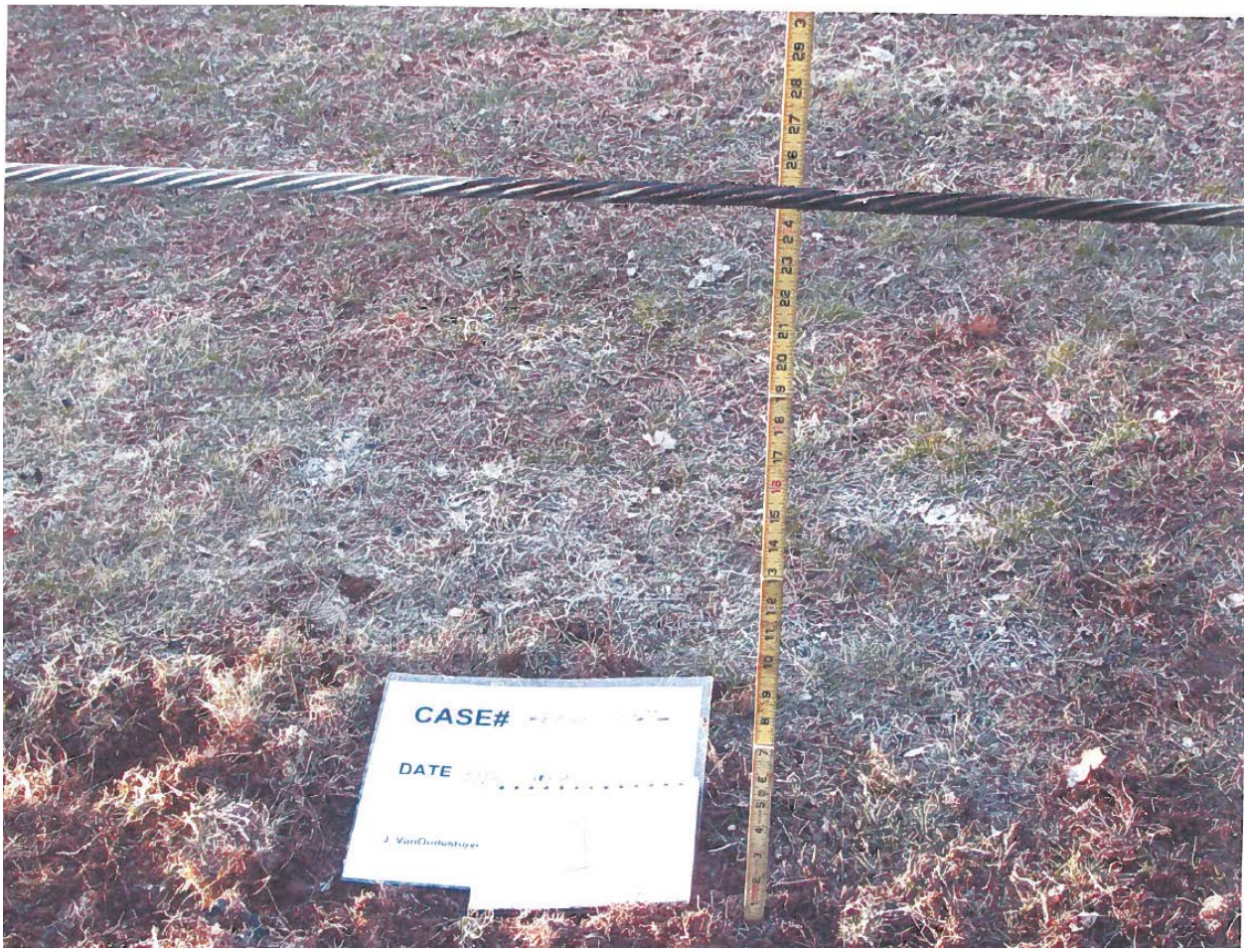



Photo B 3-14 Taken April 19, 2014 after contact was made. Closeup of the contact area. The primary conductor is of Phase 1 for W185 is approximately 24 inches above ground level. *Photo provided by Public Service Co of New Hampshire*

## Photo B 3-15

Photo B 3-15 Taken April 19, 2014 after contact was made. Closeup of the contact area and the primary conductor is of Phase 1 for W185. Discolored area of conductor is where contact was made. *Photo provided by Public Service Co of New Hampshire*

## Photo B 3-16

Photo B 3-16 Taken April 19, 2014 after contact was made. Collapse and failure of cross arm for Pole 24 of W185. Phase 2 and 3 conductors and insulators are intact. *Photo provided by Public Service of New Hampshire*

## Photo B 3-17

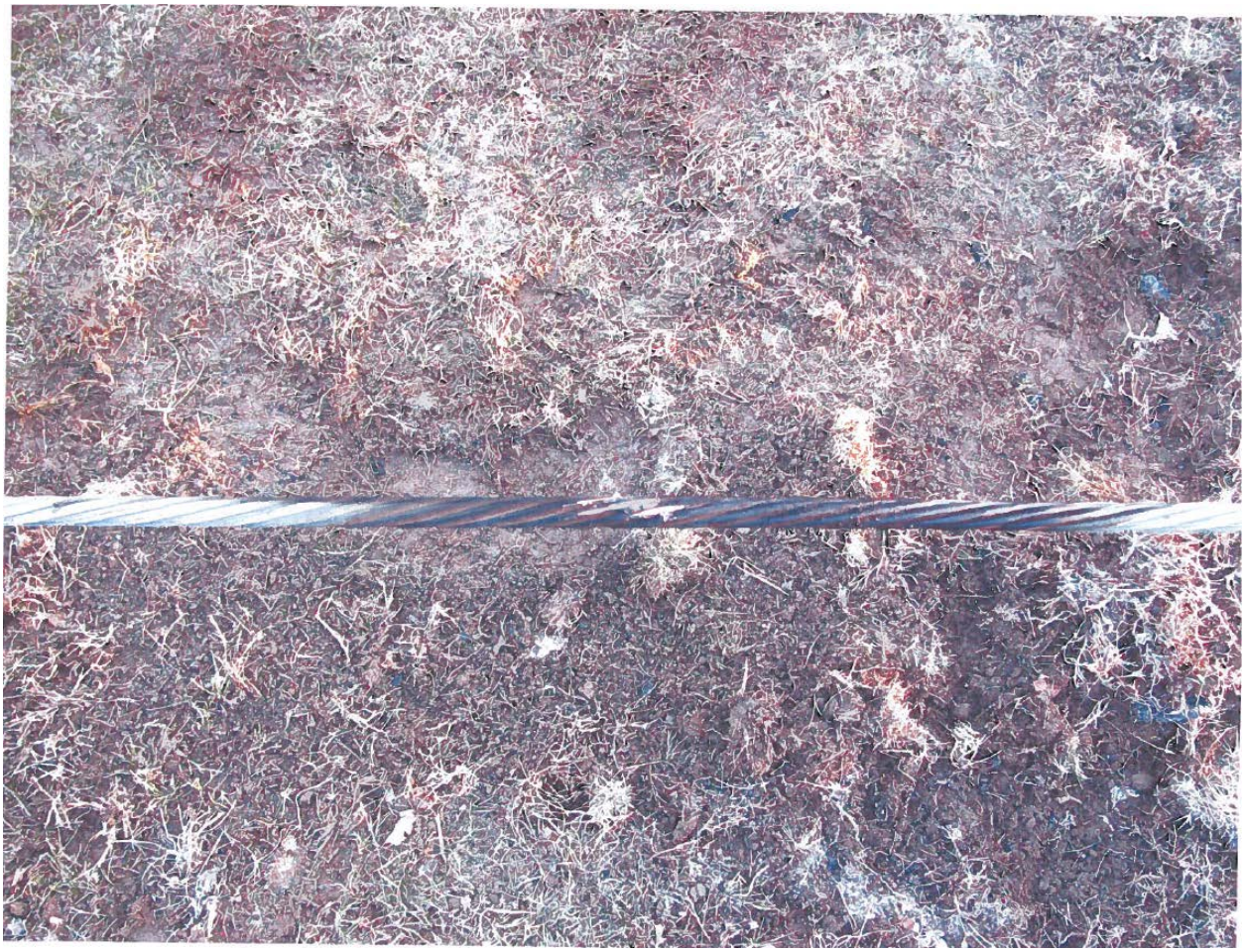


Photo B 3-17 Taken April 19, 2014 after contact was made. Close up of primary conductor rated for 7,200 volts and contact area. *Photo provided by Public Service of New Hampshire*

## Photo B 3-18

Photo B 3-18 Taken April 19, 2014 after contact was made. Eastern side of cross arm for Pole 24 of W185. Phase 1 conductor and insulator are near the base of the wooden pole. Lower wire is the neutral wire. Upper wire is the phase 2 conductor. *Photo provided by Public Service of New Hampshire*

## Photo B 3-19

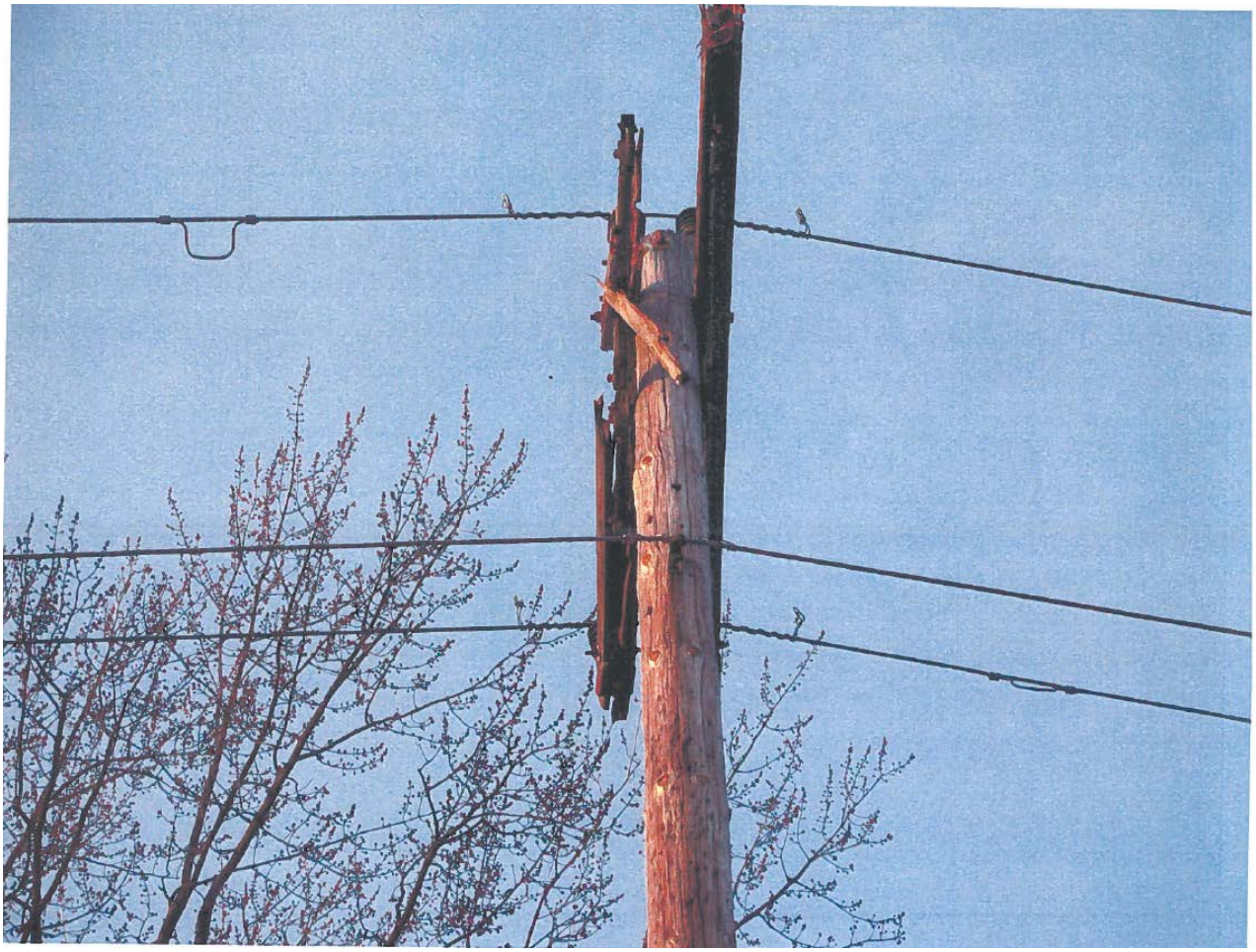


Photo B 3-19 Taken April 19, 2014 after contact was made. Taken from below Pole 24 of W185. Looking northerly, phase 1 conductor and insulator are near the base of the wooden pole. Based on angle of camera the upper wire is phase 2 conductor, the middle wire is neutral and the lowest wire is the phase 3 conductor. *Photo provided by Public Service of New Hampshire*

## Photo B 3-20

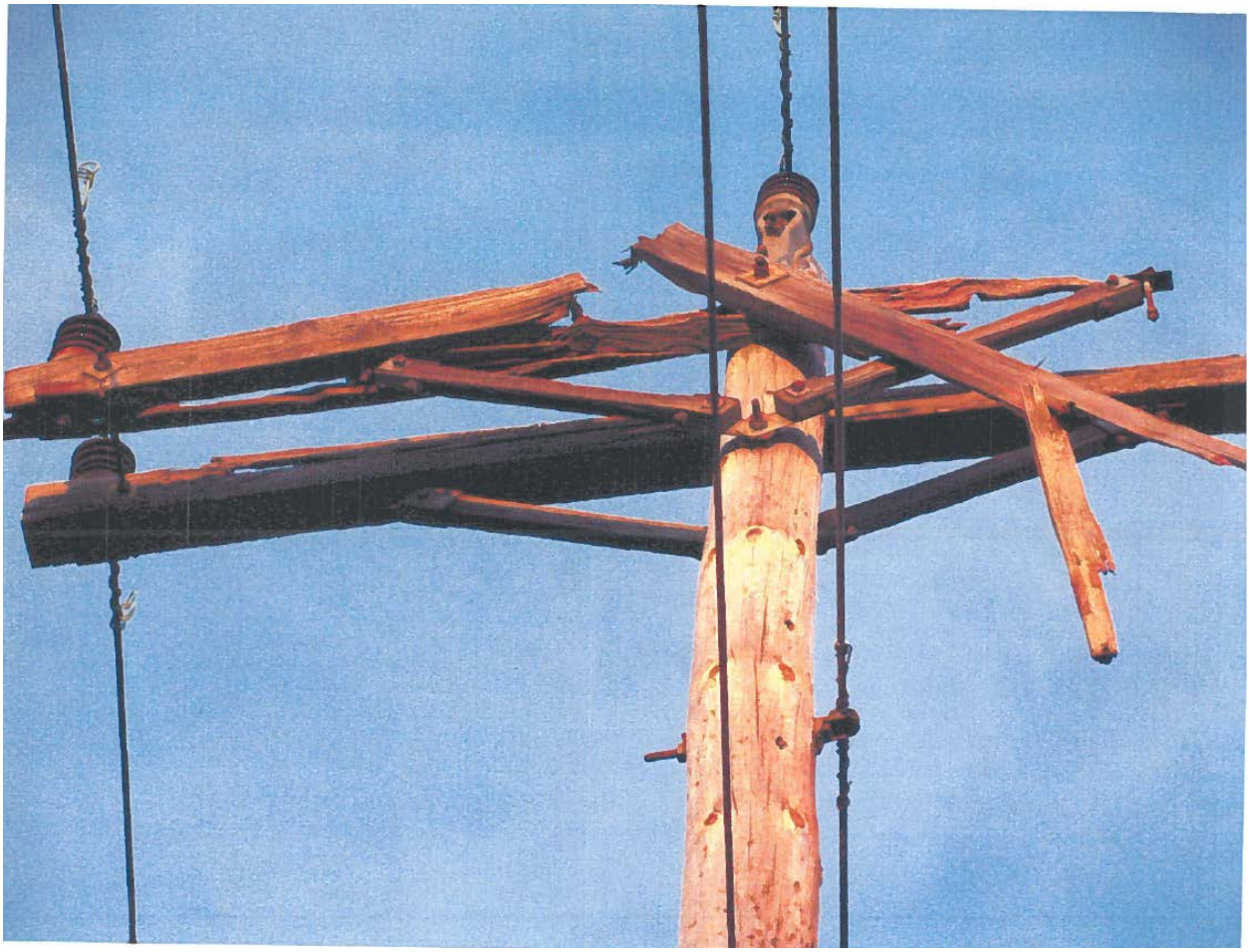


Photo B 3-20 Taken April 19, 2014 after contact was made. Western side of cross arm for Pole 24 of W185. Phase 1 conductor and insulator are near the base of the wooden pole. Phase 3 conductor is on the left side. Guy wire is second most left wire as shown. Neutral is on the foremost right side.
*Photo provided by Public Service of New Hampshire*

## Photo B 4-21

Photo B 4-21 Taken April 21, 2014. Restored and repaired double cross arm on Pole 24 of W185. Phase 1 conductor is nearest the end of the cross arm and shows clearly on the new insulators.
*Photo taken by NHPUC Safety Division*

## Photo B 4-22

Photo B 4-22 Taken April 21, 2014. Components of failed double cross arm on Pole 24 of W185 on floor of Keene Area Work Center. Insulators, removed conductor (3 ft), broken cross arm and supports *Photo taken by NHPUC Safety Division*

## Photo B 4-23

Photo B 4-23 Taken April 21, 2014. Remnants of failed double cross arm on Pole 24 of W185 on floor of Keene Area Work Center. Wood Rot is evident, bolts will no longer hold brackets on broken cross arm and supports *Photo taken by NHPUC Safety Division*

## Photo B 4-24

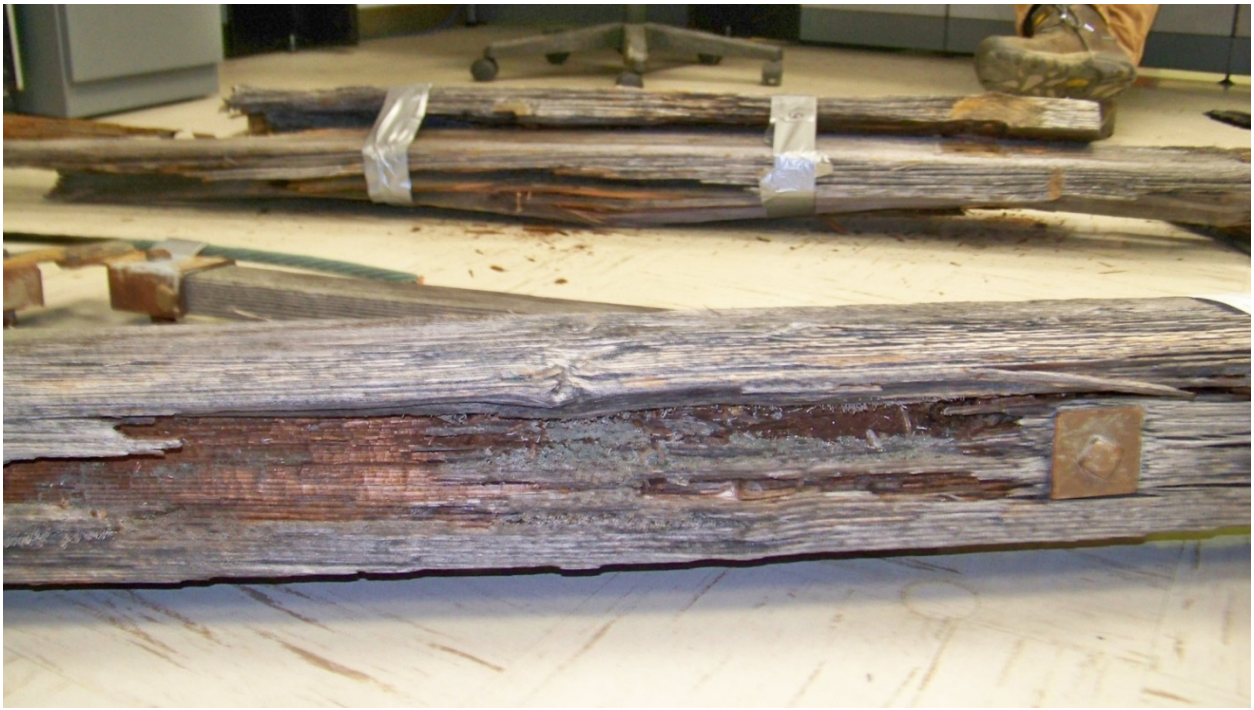
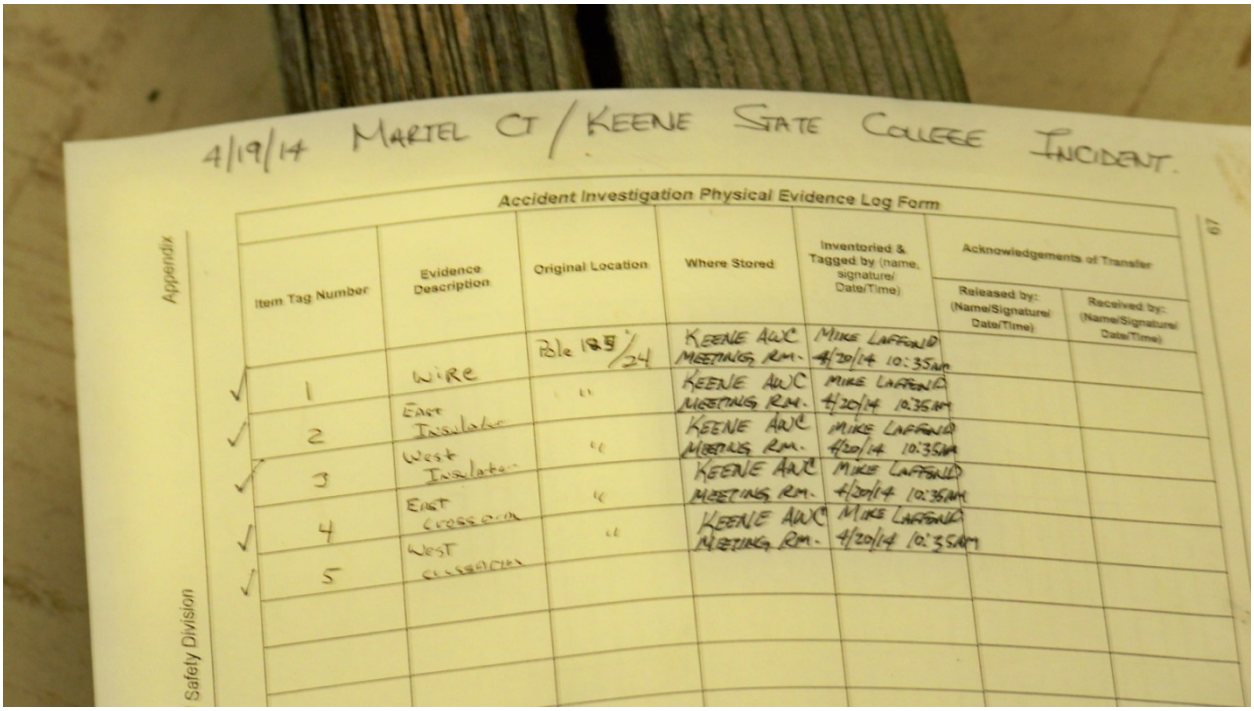


Photo B 4-24 Taken April 21, 2014. Remnants of failed double cross arm on Pole 24 of W185 on floor of Keene Area Work Center. Insect damage and wood rot witnessed on decayed broken cross arm and supports *Photo taken by NHPUC Safety Division*

## Photo B 4-25

Photo B 4-25 Taken April 21, 2014. Removed failed double cross arm on Pole 24 of W185 on floor of Keene Area Work Center. *Photo taken by NHPUC Safety Division*

## Photo B 4-26



4/19/14 MARTEL CT / KEENE STATE COLLEGE INCIDENT.

Accident Investigation Physical Evidence Log Form

| Item Tag Number | Evidence Description | Original Location | Where Stored | Inventoried & Tagged by (name, signature/ Date/Time) | Acknowledgements of Transfer: Released by: (Name/Signature/ Date/Time) | Acknowledgements of Transfer: Received by: (Name/Signature/ Date/Time) |
|---|---|---|---|---|---|---|
| 1 | WIRE | Pole 185/24 | KEENE AWC MEETING RM. | MIKE LAFFOND 4/20/14 10:35AM | | |
| 2 | East Insulator | " | KEENE AWC MEETING RM. | MIKE LAFFOND 4/20/14 10:35AM | | |
| 3 | West Insulator | " | KEENE AWC MEETING RM. | MIKE LAFFOND 4/20/14 10:35AM | | |
| 4 | East Crossarm | " | KEENE AWC MEETING RM. | MIKE LAFFOND 4/20/14 10:35AM | | |
| 5 | West Crossarm | " | KEENE AWC MEETING RM. | MIKE LAFFOND 4/20/14 10:35AM | | |

Appendix

Safety Division

Photo B 4-26 Taken April 21, 2014. Catalog of Identified components East and West Crossarms, Removed Wire and insulators from Pole 24 of W185 at Keene Area Work Center. *Photo taken by NHPUC Safety Division*

## Photo B 4-27

Photo B 4-27 Taken April 21, 2014. Removed failed double cross arm on Pole 24 of W185 on floor of Keene Area Work Center. *Photo taken by NHPUC Safety Division*

**Appendix C**

**January 15, 2014**

**PSNH Maintenance Record**

**Pole 24 W185 Circuit**

**Keene NH**

Line Number W-185 (Old Line Number _____) Inspection Date: 1/15/2004

Structure Number P.24 (Old Sta. Number _____) Inspector, Company: [illegible] A.T.E. + CO.

Pole Position: Left (L) ___ Middle (M) ✓ Right (R) ___

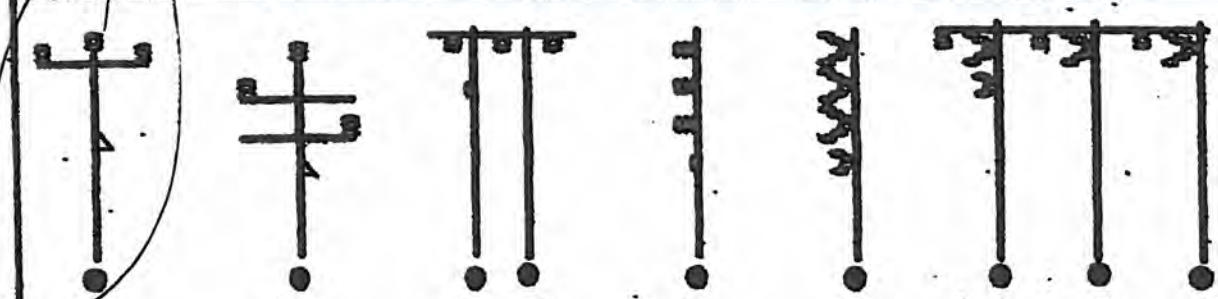
Other _____

34.5 kV

Structure Type: (Circle - Sketch Type Below or off Back)

Additional Structure Info. (check if estimated or actual birth information)

| | | | |
|---|---|---|---|
| Height/Class: _____ | Est. ___ | Actual ___ | Angle Structure? Yes ___ No ___ |
| Year: _____ | Est. ___ | Actual ___ | Dead End Structure? Yes ___ No ___ |
| Mfr: _____ | Est. ___ | Actual ___ | |
| Treatment Tag Yr.: _____ | Treater: _____ | | No Tags Found _____ |



| M | M | L R | M | M | L M R | |
|---|---|---|---|---|---|---|
| Tangent-Angle | Tangent | Tangent-Angle | Angle | Angle | Dead End Angle | Other |
| "A" - 0° | "C" | Long Spans | "SB 1" 12-25° | "DEB" | "DA" | |
| "DX to 12° | Transposition | "Special H" | "SB 2" 25-45° | + 60° | + 50° | |
| "DE to 15° | | "E" | "SB 3" 45-60° | | | |

ABOVE ILLUSTRATIONS LOOKING DOWN THE LINE (Structure No.'s increasing) Draw in all other items not shown, i.e.: X bracing, Xarms etc.

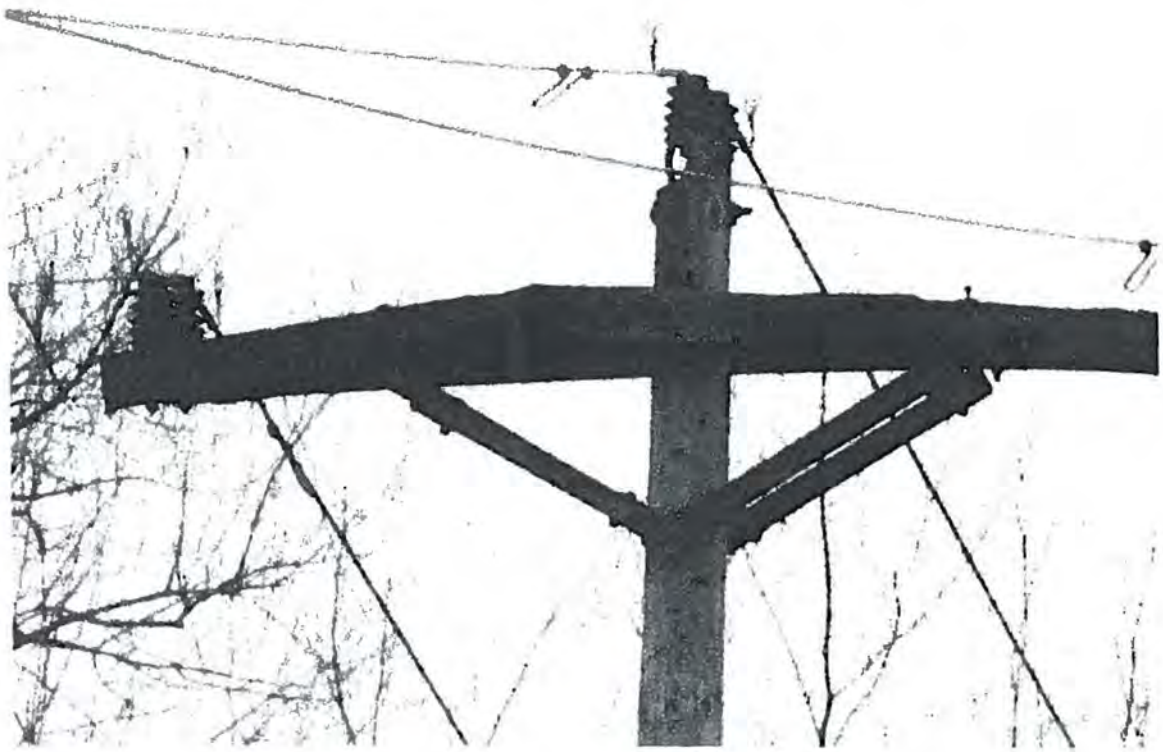
Indicate the following Pole Conditions: (Check appropriate item or write in "Remarks", N/A = Not Applicable)

| | OK | N/A | Remarks | |
|---|---|---|---|---|
| Pole Top | ✓ | | | |
| Static Wire | | ✓ | | |
| Conductor | ✓ | | | |
| Neutral | ✓ | | | |
| * Cross Arm (s) | | | Broken | Broken Cross Arm |
| Cross Arm Bracket (s) | ✓ | | | |
| Insulators | ✓ | | | |
| Insulator Connection (s) | ✓ | | | |
| Cross Bracing (s) | | ✓ | | |
| Guy Banding | ✓ | | | |
| * Guy Wire (s) | | | Loose | 1 guy loose + 1 guy Broken |
| Ground Line Area | | ✓ | | |
| Grounding | | ✓ | | |
| Guy Anchor (s) | ✓ | | | |
| Overall Pole Condition | ✓ | | | |
| _____ | | | | |

Additional Remarks, Abnormal Conditions, etc. _____

Best Access to this structure: Rte: 101 + Market Rd.

(Note: Each Pole on multi pole structures must have its own report sheet)



**TRANSMISSION STRUCTURE FIELD INSPECTION REPORT**

Line Number: W-185 (Old Line Number _____) Inspection Date: 1/15/2014

Structure Number: P-23 (Old Str. Number _____) Paul Martin A.T.E. + CO.

Pole Position: Left (L) ___ Middle (M) ✓ Right (R) ___ Other _____

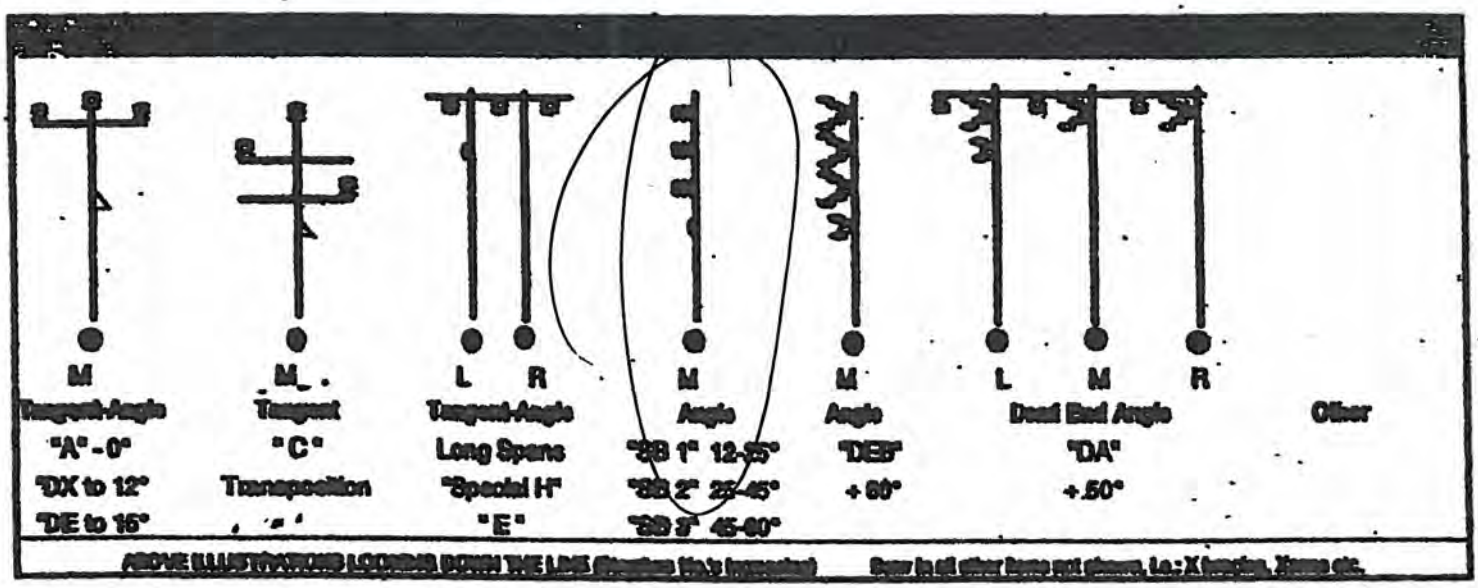
Inspector, Company

34.5 kV

Structure Type: (Circle - Sketch Type Below or off Back)

Additional Structure Info. (check if estimated or actual bith information)

| | | | |
|---|---|---|---|
| Height/Class: _____ | Est. ___ | Actual ___ | Angle Structure? Yes ___ No ___ |
| Year: _____ | Est. ___ | Actual ___ | Dead End Structure? Yes ___ No ___ |
| Mfr: _____ | Est. ___ | Actual ___ | |
| Treatment Tag Yr.: _____ | Treater: _____ | | No Tags Found _____ |




Indicate the following Pole Conditions: (Check appropriate item or write in "Remarks", N/A = Not Applicable)

| | OK | N/A | Remarks |
|---|---|---|---|
| Pole Top | ✓ | | |
| Static Wire | | ✓ | |
| Conductor | ✓ | | |
| Neutral | ✓ | | |
| Cross Arm (s) | ✓ | | |
| Cross Arm Bracket (s) | ✓ | | |
| Insulators | ✓ | | |
| Insulator Connection (s) | ✓ | | |
| Cross Bracing (s) | | ✓ | |
| Guy Bending | ✓ | | |
| * Guy Wire (s) | ~~✓~~ | | Loose — 5 wood STRAINS on guy WIRES |
| Ground Line Area | | ✓ | |
| Grounding | | ✓ | |
| Guy Anchor (s) | ✓ | | |
| Overall Pole Condition | ✓ | | |
| _____ | | | |

Additional Remarks, Abnormal Conditions, etc. _____

Best Access to this structure: RTE 101

(Note: Each Pole on multi pole structures must have it's own report sheet)

Week Ending : October 11, 2008

# Public Service New Hampshire
## Test and Treat Report

Inspection Company: UPT
Crew Number: 094132
Foreman: Aaron Jones
Supervisor: Mark Schroeder

Circuit: W185
ROW

| Tag No. | Type | Yr Set | Cl | Ht | Mfg | Species | Org Trt | Org G/L | Eff G/L | Insp Type | Extras | LYT | LTB | LTT | Decay Za/Ty | Insp Date | Visual Safety | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63 | S | 47E | 3E | 40E | KOP | SP | C | 36 | 36 | T | GPS | 00 | UPT | TE | | 10/07/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.330 | | 072.15.847 | | | | | | | | | | | |
| 47L | S | 62 | 3E | 55 | UNK | WC | P | 42 | 42 | T | GPS | 00 | UPT | TE | | 10/07/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.049 | | 072.15.965 | | | | | | | | | | | |
| 46R | S | 62 | 3E | 55E | UNK | WC | P | 45 | 45 | T | GPS | 00 | UPT | TE | | 10/07/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.989 | | 072.15.983 | | | | | | | | | | | |
| 46M | S | 62 | 3E | 55E | UNK | WC | P | 43 | 43 | T | GPS | 00 | UPT | TE | | 10/07/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.54.989 | | 072.15.983 | | | | | | | | | | | |
| 46L | S | 62 | 3E | 55E | UNK | WC | P | 46 | 46 | T | GPS | 00 | UPT | TE | | 10/07/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.54.989 | | 072.15.983 | | | | | | | | | | | |
| 46X | S | 94 | 3E | 45 | KOP | SP | P | 38 | 38 | T | GPS | 00 | UPT | TE | | 10/07/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.022 | | 072.15.972 | | | | | | | | | | | |
| 47R | S | 62 | 3E | 55 | UNK | WC | P | 41 | 41 | T | GPS | 00 | UPT | TE | | 10/07/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.049 | | 072.15.965 | | | | | | | | | | | |
| 66 | S | 79 | 3E | 35 | KOP | SP | P | 35 | 35 | T | GPS | 00 | UPT | TE | | 10/07/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.361 | | 072.15.805 | | | | | | | | | | | |
| 22 | S | 88 | 3E | 45E | UNK | WC | P | 43 | 43 | T | GPS | 00 | UPT | TE | | 10/08/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.271 | | 072.17.042 | | | | | | | | | | | |
| 24 | S | 69 | 3 | 45 | UNK | SP | C | 38 | 38 | T | GPS | 00 | UPT | TE | | 10/08/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.232 | | 072.16.980 | | | | | | | | | | | |
| 25 | S | 56E | 3E | 40E | UNK | SP | C | 35 | 35 | V | GPS | N | NONE | NO | | 10/08/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.219 | | 072.16.898 | | | | | | C:NO ACCESS OVERGROW | | | | | |
| 21 | S | 72E | 3E | 55E | UNK | WC | P | 47 | 47 | T | GPS | 00 | UPT | TE | | 10/08/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.304 | | 072.17.037 | | | | | | | | | | | |

Report Created:
10/15/200 4:55:19PM

Week Ending : October 11, 2008

# Public Service New Hampshire
## Test and Treat Report

Inspection Company: UPT
Crew Number: 094132
Foreman: Aaron Jones
Supervisor: Mark Schroeder

Circuit: W185

ROW

| Tag No. | Type | Yr Set | Cl | Ht | Mfg | Species | Org Trt | Org G/L | Eff G/L | Insp Type | Extras | LYT | LTB | LTT | Decay Zn/Ty | Insp Date | Visual Safety | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | S | 79 | 2 | 50 | UNK | WC | P | 46 | 46 | T | GPS | 00 | UPT | TE | | 10/08/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.398 | | 072.17.030 | | | | | | | | | | | |
| 18 | S | 68 | 3 | 45 | UNK | WC | P | 46 | 46 | T | GPS | 00 | UPT | TE | | 10/08/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.420 | | 072.17.029 | | | | | | | | | | | |
| 20 | S | 79 | 2 | 55E | UNK | WC | P | 48 | 48 | T | GPS | 00 | UPT | TE | | 10/08/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.356 | | 072.17.032 | | | | | | | | | | | |
| 23 | S | 62 | 3 | 45E | UNK | SP | C | 36 | 36 | T | GPS | 00 | UPT | TE | | 10/08/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.239 | | 072.17.041 | | | | | | | | | | | |
| 17 | S | 68 | 3 | 45 | UNK | WC | P | 43 | 43 | T | GPS | 00 | UPT | TE | | 10/08/2008 | | |
| | | | | | | | | 0 | | | 0 | | | | | | | |
| | | | | | 42.55.445 | | 072.17.055 | | | | | | | | | | | |

# Appendix D

**March 19, 2014**

**MUST Safety Training**

**Keene NH**

Be Prepared to Work Safely this Spring.
Join us at a Free Excavation Safety Breakfast Seminar.

## Sponsored by:

- AT&T
- Bangor Hydro Electric
- Bangor Gas
- Central Maine Power
- Champagne's Energy
- Columbia Gas of Massachusetts
- Comcast
- Common Ground Alliance
- Dig Safe
- Dig Smart of Maine
- ENPRO
- ETTI
- Exxon/Mobil
- FairPoint Communications
- Kinder Morgan/Tennessee Gas Pipeline
- Liberty Utilities
- M&N Operating Co.
- Maine PUC
- Massachusetts DPU
- National Grid
- NH Gas
- NH PUC
- NStar
- On Target Utility Services
- PNGTS
- Portland-Montreal Pipe Line
- Propane Gas Association of New England
- Public Service of NH
- R. H. Foster
- RI PUC
- Spectra Energy
- Summit Natural Gas of Maine
- Tennessee Gas Pipeline
- Unitil
- Verizon
- Vermont DPS

Communication
Cooperation
Education
Safe Excavation

Kristin 55

M.U.S.T.
C/O Dig Safe System, Inc.
11 Upton Drive
Wilmington, MA 01887



811

# FREE 2014 Excavation Safety Breakfast Seminars

MUST
MANAGING UNDERGROUND SAFETY TRAINING

Communication +
Cooperation +
Education =
Safe Excavation

MUST
MANAGING UNDERGROUND SAFETY TRAINING

## 2014 Safety Breakfast Seminars

Before the start of the busy construction season, prepare your crew for working safely around our growing underground infrastructure.

Hear from the experts to learn more about:

- Potential hazards of utility damage
- Damage Prevention laws and rules
- Dig Safe notification procedures
- Common Ground Alliance's Best Practices
- Working safely around underground electric, gas transmission and distribution, propane and communications facilities
- Marking techniques for proposed excavation sites and underground facilities
- Excavator impact and experience
- Enforcement and regulation

### MAINE

Sign up at must-ne.com
or 888-883-MUST

3/25/14 BANGOR
Spectacular Events Center
395 Griffin Road

3/26/14 SACO
Ramada Inn
352 North Street

3/31/14 PRESQUE ISLE
Northern Maine Community College
33 Edgemont Drive

4/16/14 AUGUSTA
Augusta Civic Center
76 Community Drive

### MASSACHUSETTS

Sign up at must-ne.com
or 800-698-0940
Press 1, then ext. 1560

3/3/14 PEABODY
Holiday Inn
1 Newbury Street
(Route 1)

3/4/14 SPRINGFIELD
Basketball Hall of Fame
1000 Hall of Fame Ave

3/5/14 TAUNTON
Holiday Inn
700 Myles Standish Blvd

3/6/14 HAVERHILL
DiBurro's Function Facility
887 Boston Road

3/13/14 DEVENS
Devens Common Center
31 Andrews Parkway

### NEW HAMPSHIRE

Sign up at must-ne.com
or 888-883-MUST

3/17/14 NASHUA
Crowne Plaza Hotel
2 Somerset Parkway

3/18/14 WHITEFIELD
Mountainview Grand Hotel
101 Mountain View Road

3/19/14 KEENE
Keene State College
229 Main Street

3/20/14 HAMPTON
Ashworth by the Sea
295 Ocean Boulevard

### RHODE ISLAND

Sign up at must-ne.com
or 800-698-0940
Press 1, then ext. 1560

3/11/14 WARWICK
Radisson Hotel
2081 Post Road

### VERMONT

Sign up at must-ne.com
or 802-951-0370

4/1/13 MIDDLEBURY
Middlebury Inn
14 Court Square

4/2/14 BURLINGTON
Doubletree Hilton Hotel
1117 Williston Road

4/3/14 SAINT ALBANS
St. Albans Historical Museum - Bliss Center
9 Church Street

**Registration 7:00am; Breakfast 7:30am, Program 8:00am.**

811

MUST
MANAGING UNDERGROUND SAFETY TRAINING

SPACE IS LIMITED!
Register now at www.must-ne.com

**MARCH 19, 2014 KEENE, NH**

| Company | Name | registered | attended |
|---|---|---|---|
| BDM Sweeper Swervice Inc | Matthew Robinson | 3 | 2 |
| Berg Contracting | Joel Berg | 5 | |
| Comcast | Ivan Peelle | 1 | 1 |
| D.R. Key Corp | Dana Key | 2 | |
| keene state | Donald Sherrick | 1 | 1 |
| Keene State College | William Rymes | 1 | |
| Keene state College | Elena Knorr | 1 | 1 |
| Keene State College | Nathan DeMond | 1 | 1 |
| Keene State College | Bud Winsor | 1 | 1 |
| Keene State College | Geoff Davis | 1 | 1 |
| keene state college | Joe Britton | 1 | 1 |
| Keene State College | Scott Evans | 1 | 1 |
| Keene State College | Dee Denehy | 1 | 1 |
| Keene State College | Brendan Woods | 1 | 1 |
| keene state college | Kennth Maynard | 1 | 1 |
| KSC | Doug Adler | 1 | 1 |
| Larry Hill Construction | Larry Hill | 2 | 3 |
| LJM Construction LLC | John Cooper | 8 | |
| McElreavys Property management | Keith McElreavy | 2 | 1 |
| MONADNOCK SEPTIC DESIGN LLC | Scott & Carl Hagstrom | 2 | 2 |
| NH Fish & Game | Alan Moody | 4 | 2 |
| NHDOT | Julie Kroupa | 10 | 10 |
| North Swanzey Water & Fire Precinct | Sly Karasinski | 1 | 1 |
| On Target Services | Craig Weed | 1 | |
| RH WHITE | | | 1 |
| Phil Caron Trucking & Excavating | Dana Caron | 1 | |
| S. W. Cole Engineering Inc. | Andrew Michaud | 3 | 1 |
| Septic Manager/Ed Csenge & Son Excavating | Ed Csenge | 7 | 6 |
| Thomas Drilling & Blasting | John Whittaker | 1 | 1 |
| Town of Charlestown Hwy. | Keith Weed | 6 | 5 |
| Town of Hancock | Kurtis Grassett | 2 | 2 |
| Twin State Utilities Corp. | George Burns | 5 | 5 |
| UMass EH&S | Robert Laford | 1 | |
| | | 79 | 54 |

811 DigSafe MA·ME·NH·RI·VT

# Electric Presentation

MUST
MANAGING UNDERGROUND SAFETY TRAINING

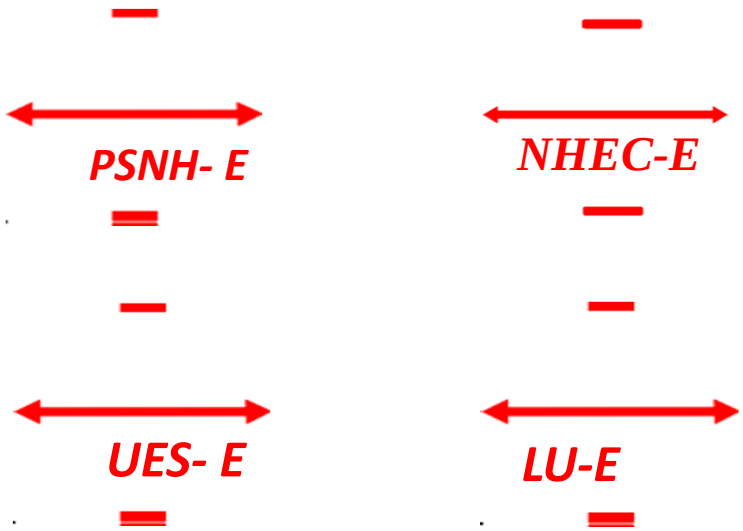
Public Service of New Hampshire
The Northeast Utilities System

Liberty Utilities

your New Hampshire Electric Co-op
A Touchstone Energy® Cooperative

Unitil

# Electric Utilities Markings




# Padmounted Transformer

# Warning Labels/Inspections

# Warnings Disregarded

## Warnings Disregarded

## Warnings Disregarded

# Primary Sector Cabinet

# Primary Sector Cabinet

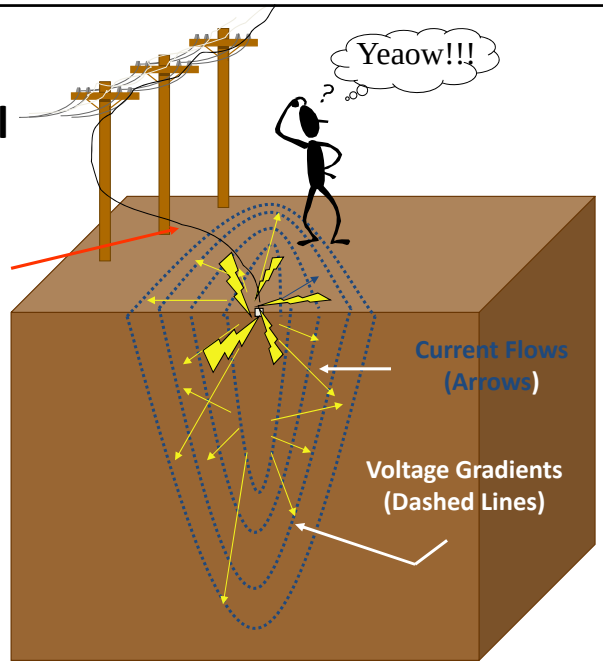
# 3phase Riser

## Substation "Getaways"

# Switchgear

# Wire Down – Safe Zone

# Step Potential




# Escape the area

- If you begin to feel a sensation place both feet together
- Shuffle your feet keeping contact with the ground with both feet as you move further back
- Another option is to hop away from the area with both feet together

No!!

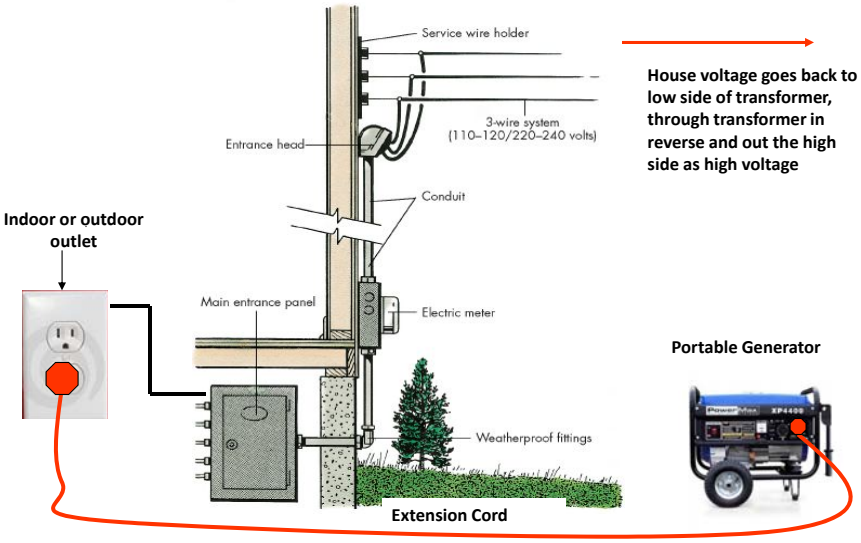
Yes!!

# Protecting Yourself

- **What is a safe distance to stay back for down wires or equipment?**
  - **10’**
  - **15’**
  - **20’**
  - **25’**
  - **30’**
  - **40’**

**Stay back 30’ from the closest piece of down wire or electrical equipment….this avoids step potential**

# Understanding Backfeed




**House voltage goes back to low side of transformer, through transformer in reverse and out the high side as high voltage**

**Indoor or outdoor outlet**

# Safe Zone- More Hidden Hazards

**Down wires fall anywhere and everywhere…if they are down on a fence, guardrail, or RR track, they too may be energized…Stay Clear**

Oh Crap!2.wmv

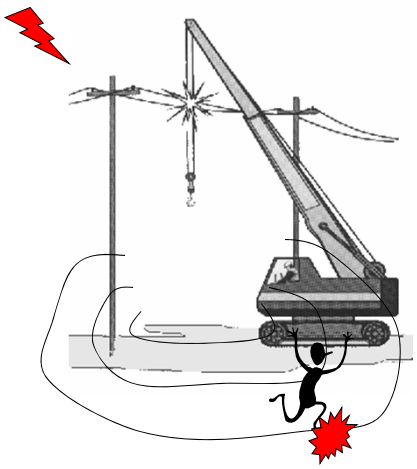
# Working Clearances - OSHA

**Backhoes & Excavators & Cranes***

- For lines 50 kV and below (including secondaries), OSHA Minimum = **10' Clearance**
- * Crane operation has other specific rules and if voltage is not known crane must remain 20 feet away unless de-energized and grounded.

# Mitigate the Hazards

- Contact utility who have 2 days to provide response on voltage level.
- Survey & Identify hazards > wire, poles, anchors, guys, terrain
- Cone & tape off area. Spotter, warning device.
- Avoid touching equipment at all times
- Avoid stepping/walking away if contact made
- 25% of deaths for crane fatalities are due to power line contact.



# Distribution Pole/Lines

**Typical pole construction layout**

**Location on pole governed by NESC**

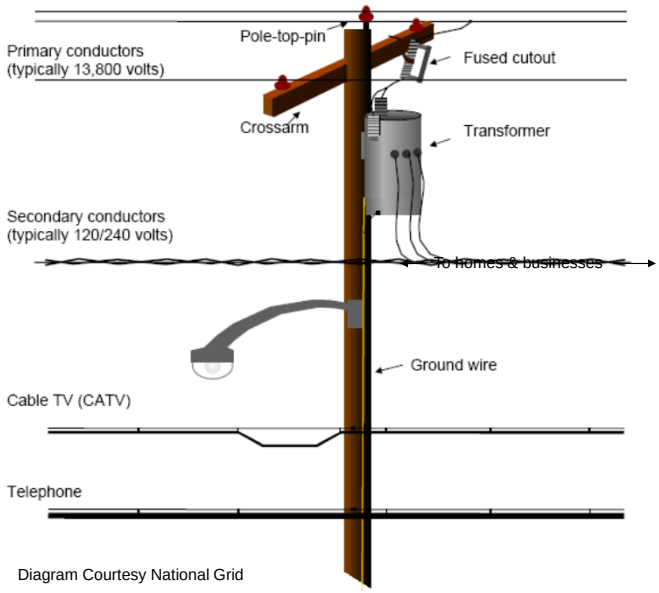



Diagram Courtesy National Grid

# Questions ??

**Appendix E**

**June 16, 2014**

**NH Fire Marshal's Office**

**Incident Report of**

**Electrocution April 19, 2014**

**Keene NH**

# New Hampshire State Fire Marshal's Office

INCIDENT REPORT

**Official Law Enforcement Report - Unauthorized Dissemination is Prohibited**

**Incident Type:** Fire / Accidental **Result Type:**

**Agency Incident ID:** 1140046 **BATS ID:** i- 332094

## Incident Date/Time/Location

**Status**
Investigation Closed

**Jurisdiction**
Primary

**Start Date/Time**
4/19/2014 2:18 PM Saturday

**Address - Street Address**
110 Krif Road

**City/State/Zip**
KEENE , NH 03435

**County**
CHESHIRE

## Investigator Information

| Name | Phone | Email |
|---|---|---|
| Christopher T Wyman | 603-223-4289 | Christopher.Wyman@dos.nh.gov |

| Title | Badge Number |
|---|---|
| Investigator | 905 |

## Property Use or Target Information

| Type | Subtype |
|---|---|
| Outside / Special Properties | Open land / field |



COPY OF CASE FILE#1140046

## Scene Details

### Area of Origin/Device Placement

**Area of Origin**
Other

**Area of Origin Subtype**
Wildland, woods

**Fire Descriptors**

Arcs and sparks
Ground Fuels - Wildland (e.g., duff, peat soils, tree roots, leaf litter, grass, low brush, and dead wood)
Multiple fires (separate, unrelated, distinct)
Open Flame

## Damage and Casualties

**Number of Fatalities**
1

**Pre Incident Value**
$0.00

**Primary Gov't Association**
Property is Associated With State Government

## Miscellaneous Information

**Other Agencies Involved**
Keene FD / PD

**Sky Conditions**
Scattered Clouds

**Wind Speed/Direction**
17 MPH / N

**Temperature**
57F

**Humidity**
36%

**Investigator Right of Entry**
Consent
Public Access

## Contact Arrival

| Requesting Person | Requesting Agency | Requested Date | Arrival Date | Scene Released Date |
|---|---|---|---|---|
| Marc Howard - Fire Chief | Keene Fire Department | 4/19/2014 2:58 PM | 4/19/2014 4:37 PM | 4/19/2014 6:00 PM |

## Person/Organization Information

**Name**
COLE, DANIELLE

**Business Name**
NH State Fire Marshal's Office

**Race**
White

**Sex**
F

**Juvenile**
No

**Relationship(s)**
Law Enforcement Official

## Address Information

**Street Address**
33 Hazen Drive

**City/State/Zip**
CONCORD
03305

**County**
, MERRIMACK

## Contact Information

**Primary Phone**
603-223-4289

**Name**
DEMOND, NATHAN

**Business Name**
Keene State College - Grounds Crew

**DOB**
[redacted]

**Race**
White

**Ethnicity**
Non-Hispanic

**Sex**
M

**Age at time of Incident**
46

**Juvenile**
No

**Name**

BOUSQUET, BRENDAN

**Business Name**

Keene State College Security

**DOB**

[redacted]

**Race**

White

**Ethnicity**

**Sex**

M

**Age at time of Incident**

48

**Juvenile**

No

**Relationship(s)**

Discovering Party, Reporting Party, Witness

## Address Information

**Street Address**

[redacted]

**City/State/Zip**

[redacted]

**County**

CHESHIRE

## Contact Information

**Primary Phone**

[redacted]

**Name**

LAFRENIERE, GARY

**Business Name**

Captain - Keene Fire Department

**Race**

White

**Sex**

M

**Juvenile**

No

**Relationship(s)**

Firefighter - Career Dept

**Name**
SNIDE, CONNOR

**Business Name**
Keene State College - Grounds Crew

**DOB**
[redacted]

**Race**
White

**Ethnicity**
Non-Hispanic

**Sex**
M

**Age at time of Incident**
23

**Juvenile**
No

**Relationship(s)**

Witness

## Address Information

**Street Address**
[redacted]

**City/State/Zip**
[redacted]

**County**
, CHESHIRE

## Contact Information

**Primary Phone**
[redacted]

**Name**
DAVIS, GEOFF

**Business Name**
Keene State College - Grounds Crew

**DOB**
[redacted]

**Race**
White

**Ethnicity**
Non-Hispanic

**Sex**
M

**Age at time of Incident**
30

**Juvenile**

**Juvenile**
No
**Relationship(s)**

Witness

## Address Information

**Street Address**
[redacted]

**City/State/Zip** **County**
[redacted] , CHESHIRE

## Contact Information

**Primary Phone**
[redacted]

**Name**

RICHMOND, TIMOTHY

**Business Name**

Keene State College - Grounds Crew

**DOB**
[redacted]

**Race** **Ethnicity**
White Non-Hispanic

**Sex**
M

**Age at time of Incident**
22

**Juvenile**
No
**Relationship(s)**

Witness

## Address Information

**Street Address**

[redacted]

**City/State/Zip**

[redacted]

**County**

, CHESHIRE

## Contact Information

**Primary Phone**

[redacted]

**Name**

SWAIN, ROSEMARY

**Business Name**

NH Medical Examiner's Office - ADME

**Race**

White

**Sex**

F

**Juvenile**

No

**Relationship(s)**

Government Official (non-police/fire)

**Name**

CLARK, STEPHEN

**Business Name**

Public Service Company of NH

**Juvenile**

No

**Relationship(s)**

Other

## Address Information

**Street Address**
780 North Commercial Street

**City/State/Zip**
MANCHESTER
, 03101

**County**
HILLSBOROUGH

## Contact Information

**Primary Phone**
603-634-2410

**Name**
LANG, DANIEL

**Business Name**
Keene Fire Department

**DOB**
[redacted]

**Race**
White

**Ethnicity**
Non-Hispanic

**Sex**
M

**Age at time of Incident**
40

**Juvenile**
No

**Relationship(s)**

Firefighter - Career Dept, Witness

**Name**
READ, TIMOTHY

**Business Name**
Keene Fire Department

**DOB**
[redacted]

**Race**
White

**Ethnicity**
Non-Hispanic

**Sex**
M

**Age at time of Incident**
46

**Juvenile**
No

**Relationship(s)**

Firefighter - Career Dept, Witness

**Name**

BROWN, ZACHARY

**DOB**

[redacted]

**Race**

**Ethnicity**

**Age at time of Incident**

20

**Juvenile**

No

**Relationship(s)**

Reporting Party

**Notes**

Person reporting the power line down.

## Address Information

**Street Address**

[redacted]

**City/State/Zip**

[redacted]

**County**

HARTFORD

## Contact Information

**Primary Phone**

[redacted]

**Name**

BROWN, ZACHARY

**DOB**

[redacted]

**Race**

**Ethnicity**

**Age at time of Incident**

20

**Juvenile**

No

**Relationship(s)**

Reporting Party

**Notes**

Person reporting the power line down.

**Relationship(s)**

Deceased

## Address Information

**Street Address**

[redacted]

**City/State/Zip** **County**

[redacted] CHESHIRE

, [redacted]

## Contact Information

**Primary Phone**

[redacted]

**Name**

DEMOND, REBECCA

**Race**

White

**Sex**

F

**Juvenile**

No

**Relationship(s)**

Spouse

## Address Information

**Street Address**

[redacted]

**City/State/Zip**

[redacted]

**County**

CHESHIRE

## Contact Information

**Primary Phone**

[redacted]

## Narrative(s)

**Title**
Interview of Brendan Bosquet

**Author**
Danielle Cole
[redacted]
danielle.cole@dos.nh.gov

**Description**

On April 19, 2014 I was called to respond to an incident that had occurred at Keene State College in the City of Keene involving a downed electrical wire and a fatality. I arrived at the scene and spoke with a subject who was present at the time:

Sgt. Brendan Bosquet
Keene State College Campus Safety

Who was working at the time of the incident. BOSQUET stated that at approximately 1400 hours that day a student had called to report that there was a power line down in the area leading to the stadium. BOSQUET did not know of the exact location of the power line and went to check the area. As he was out looking for the power line he came across a member of the college grounds staff, Nathan DeMond who was working but had some downtime between games and was bird watching. BOSQUET stated that DEMOND had a camera on him to take photos of the birds and he showed BOSQUET some photos.

When BOSQUET explained to DEMOND what he was out looking for DEMOND agreed to help look for the downed power line. DEMOND went out in one direction and BOSQUET went out in another. A short time later BOSQUET heard DEMOND say something to the affect of "I think I found it" and then "it doesn't look live." After those two comments BOSQUET heard DEMOND yell and saw his figure drop to the ground. BOSQUET had to go around an area of water to be able to get access to where DEMOND was. As BOSQUET was heading there he called in to report the situation to dispatch. When BOSQUET located DEMOND again he was joined by a female campus safety officer. As they approached where DEMOND was located they were able to see him. He was lying on his back with his right leg hung up entangled in the power line with his head facing toward Route 101.

At one point DEMOND was moving his head up and down and was attempting to move his leg from where it was across the wire. BOSQUET reported that when DEMOND moved his leg from the wire his foot caught on fire and the fire spread up his body to his head.

See DLC-1, a digital recording of the interview for more details.

END OF REPORT

**Title**
Interview of Phil Davis

**Author**
Danielle Cole
[redacted]
danielle.cole@dos.nh.gov

**Description**

On April 19, 2014 I was called to respond to an incident that had occurred at Keene State College in the City of Keene involving a downed electrical wire and a fatality. I arrived at the scene and spoke with a subject who responded to the fire:

Phil Davis
Fire Fighter
Keene Fire Department

Who was sent to the call which came in as a person electrocuted. DAVIS stated that he carried in the medical bag to the call but that they were unable to get close to the victim because of the power line. DAVIS described that DEMOND was lying on his back with his right leg on top of the wire. DAVIS stated that DEMOND was still alive because he was lifting his head up and down attempting to get off of the wire. DAVIS stated that when DEMOND started to move his leg he heard the electricity up the line hitting the ground. DAVIS stated that there was a small brush fire in close proximity to where DEMOND was lying.

See DLC-2, a digital recording for more information.

END OF REPORT

**Title**
Keene State College Electrocution Investigation

**Author**
Christopher Wyman
[redacted]
Christopher.Wyman@dos.nh.gov

**Description**

Incident Information:

On Saturday, April 19, 2014 at approximately 2:00 pm, Keene State College Security officers were dispatched to the rear area of the Owl Athletic Stadium for the report a power line down. A student walking in the area observed the line down and called security. While searching for the power line, a Keene State College grounds crew member located the downed power and came in contact with the live power line. When security officers reached the grounds crew member they could observe that his leg was still in contact with the power line and contacted the Keene Fire Department. The incident resulted in the death of the grounds crew member and an approximately half acre brush fire.

Property Description:

The property involved is an open grass field area owned by Keene State College adjacent to a river. The utility equipment involved is Public Service Company of New Hampshire pole # 185 / 24. This pole supports three, three phase distribution lines which supply 12,500 volts phase to phase and 7,200 volts phase to ground. According to PSNH representative Mr. Stephen Clark the pole involved was last inspected by ground crew in January 2014 and by an aerial inspection in October of 2013. Clark stated that PSNH's initial inspection of the cross arms of the pole found no evidence that the cross arms or pole had been tampered with.

Investigation:

On Saturday, April 19, 2014 at approximately 3:00 pm, I was contacted by telephone by Deputy State Fire Marshal Robert Farley and advised me to respond to a possible electrocution and small brush fire in the rear of the Owl's Stadium, 110 Kriff Road, on the Keene State College campus. FARLEY stated that a Keene State College employee had possibly come in contact with a live, down power line resulting in a small brush fire and the employee's death. FARLEY stated that investigator Danielle Cole would also be responding and that the Keene Fire and Police Departments were securing the scene and awaiting our arrival. At approximately 4:37 PM, COLE and I arrived at the scene and entered the athletic fields by a foot bride connecting Martel Court to the rear of the fields. Keene State College Security personnel were limiting access to the fields at the Martel Court end of the bridge. COLE and I crossed the foot bridge and followed the river to the right back towards Rt. 101. About 200 yards down we found Keene Fire and Police personnel in an open grass area adjacent to the river.

Once we arrived at the open grass area, we were able to observe a green colored power line hanging off the ground approximately two feet running from west to east. Directly under the hanging power line was the deceased male victim. We were able to observe that the victim was lying supine with his head pointed west and his feet pointed east towards Martel Court. We were able to observe that the victim's clothing was burned

and that the victim was covered with a yellow colored powder. Fire Fighters at the scene stated that they had utilized a dry chemical fire extinguisher to put out the fire on the victim. To the left of the victim, we were able to observe a large area of brush that had been burned also as a result of the downed wire. Keene Fire Department estimated the area at approximately a half an acre. Also located in the same area was a wooden power line pole with wooden cross arms at the top. The cross arms to the south side of the pole appeared to have broken; thus causing the power line to fall towards the ground.

While at the scene Captain Gary LaFreniere provided COLE and I an incident briefing. LAFRENIERE stated that Keene State College Security Officer, Sgt. Brendan Bousquet was responding to the report of a power line down in the area at approximately 2:00 PM. LAFRENIERE stated that the down wire was reported by a KSC student, later identified as Mr. Zachary Brown. LAFRENIERE stated that when BOUSQUET arrived in the area he ran into Mr. Nathan DeMond, a member of the Keene State College Grounds Crew. LAFRENIERE stated that after they had a brief conversation, DEMOND volunteered to help BOUSQUET look for the downed wire. BOUSQUET returned to Martel Court and proceeded to the opposite side of the fields, while DEMOND continued along the river. LAFRENIERE stated that when BOUSQUET got to the opposite side of the wooded area, DEMOND yelled to BOUSQUET that he had found the downed power line and thought it was dead. LAFRENIERE stated that BOUSQUET then heard a yell and a groan coming from where DEMOND was located. LAFRENIERE stated that BOUSQUET immediately went to the area where DEMOND was located and also contacted the Keene Fire Department to respond for a man down. LAFRENIERE stated that when BOUSQUET found DEMOND, he was lying on his back, his right leg in the air with the back of his right foot on the power line. LAFRENIERE stated that the Keene Fire Department was dispatched at 2:20 PM and the first unit arrived at the scene at approximately 2:23 PM. LAFRENIERE stated that the first arriving Fire Fighters made the same observations about the victim and immediately contacted Public Service Company of New Hampshire to de-energize the power line. LAFRENIERE stated that at some point the victim's foot came off the power line, an arch was observed and the victim's clothing ignited on fire. At approximately the same time, fire fighters observed the brush fire starting.

Following LAFRENIERE'S incident briefing the scene and the victim were photographed and a scene inspection conducted. Prior to our arrival, LAFRENIERE with the assistance of on scene personnel had conducted measurements of the victim's location. During the scene inspection I was able to observe a burned area on the top of the power line. The area had been blackened by the fire resulting from the victim's contact with the power line. The ground the victim was lying on was grass that had been mowed and was found to be damp to the touch. Fire damage was observed to be limited to the small burn area on the power line and the victim. While inspecting the area surrounding the power line pole, I was able to observe that the remains of the broken cross arms were lying on the ground at the base of the pole. The power line was observed to be approximately one foot off the ground and resting on the insulators, which would have been on the cross arms.

Once ADME Rosemary Swain arrived at the scene, I assisted her with examination of the victim. ADME SWAIN photographed the victim and overall incident scene. At approximately 6:05 PM, the victim was removed from the scene and transported to the State Medical Examiner's Office in Concord by Foley's Funeral Home for autopsy and positive identification. During the removal of the victim, a digital camera was located under the victim's right side. Several other items were also found with the victim and identified on a possessed property report. This items, with the exception of the digital camera, NH Driver's License and a Keene State College photo ID were given to the Keene Police Department so they could be returned to the

victim's wife. COLE and I cleared the scene at approximately 6:30 PM after speaking with family members of DeMond that were waiting on Martel Court.

On Monday, April 21, 2014, I attended the autopsy of Mr. Nathan DeMond which was conducted by Dr. Jennie Duval at Medical Examiner's Office at Concord Hospital. At the conclusion of the examination it was discovered that the victim's preliminary CO level was 1.8 %. Dr. Duval listed the cause of death as "high voltage electrocution" following contact with a downed power line.

Evidence:

With the consent of the Mrs. Rebecca DeMond several digital photographs were copied from the digital camera found with victim. Three photos contained on the camera showed that the victim had taken pictures of the downed power line and the broken pole prior to the incident. The camera and a Keene State College employee identification found with the victim were returned to Mrs. DeMond on May 12, 2014 at her residence.

G. Interviews:

On Wednesday, April 23, 2014, at approximately 2:00 PM, I had the opportunity to speak with Mrs. Rebecca DeMond by telephone. DEMOND confirmed that her husband was working the day of the incident and that he was working from about 6:00 AM to approximately 3:30 to 4:00 PM. DEMOND stated that the end time depended on how long the games were going that day. DEMOND stated that her husband had been a full-time employee at the college since approximately 2000. DEMOND stated that her husband was a bird watcher and normally carried a camera with him at work to photograph birds on his breaks. During our conversation I asked Mrs. DeMond if I could review the photos contained on the camera found with DEMOND at the scene. Mrs. DeMond granted me verbal permission to review and copy the photographs. The remainder of our conversation I was answering what questions I could for Mrs. DeMond.

On April 29, 2014 at approximately 12:00 PM, I had the opportunity to speak with the following people working with DEMOND the day of the incident Mr. Connor Snide, Mr. Geoff Davis, and Mr. Timothy Richmond. The men stated that they came on duty at 6:00 AM the day of the incident. They stated that games that day were scheduled to go until about 3:30 – 4:00 PM. The three men stated they last spoke with DEMOND just before 2:00 PM. They stated that DEMOND told them that he was going to the concession stand for popcorn and hot chocolate, and to take a break. They stated that no one reported a downed power line to them and didn't know anything was wrong until they heard sirens. DAVIS stated that he looked across the field and could see smoke from a brush fire. DAVIS stated that as he was running across the fields the fire department was pulling into the stadium area. DAVIS stated that by the time he reached where DEMOND was located, the fire department EMS crew was already there. All three men stated that DEMOND normally goes bird watching on every break and is always carrying his camera with him to take pictures of birds. The three men stated that they believed the wind was blowing S/SE across the athletic fields that day.

The party initially reporting the downed power line is Mr. Zachary Brown, a KSC student. Mr. Brown did not return phone calls.

Conclusions:

Following an autopsy of the victim conducted on April 21, 2014, the state Deputy Medical Examiner, Dr. Jennie Duval, determined that the victim died as a result of high voltage electrocution. The fire on the victim and the subsequent brush fire are most probably the result of the energy from the power line being transferred to the ground. Witnesses reported seeing arcing while the victim's right foot was in contact with the power line. How Mr. DeMond came in contact with the power line has not been determined. Based on Sgt. Bousquet's statement, Mr. DeMond may have been under the impression that the power line was de-energized. As far as the damage to the utility pole, the New Hampshire Public Utilities Commission and Public Service Company of NH are conducting the investigation into what caused the cross arms to break which resulted in the power line coming down. In the absence of any new information forthcoming, the cause of this incident and fire shall be classified as "Accidental" and this report shall stand as final.

## Property

This section intentionally left blank

6/16/2014

Investigator - Wyman, Christopher Date

6/16/2014

District Chief - SOUTHWELL, JOHN Date