

## Distribution Incident Investigation Report

**Pipeline System:** Hampton Intermediate 45psig distribution system      **Operator:** Northern Utilities (Unitil)  
**Operator ID:** 19340      **Unit Number:** \_\_\_\_\_      **Activity Number:** \_\_\_\_\_  
**Location:** 68 Locke Rd, Hampton, NH 03842      **Date of Occurrence:** February 20, 2015  
**Material Released:** Natural Gas      **Quantity:** Unestimated by Operator  
**PHMSA Arrival Time & Date:** Feb 20 2015 at 11:30      **Total Damages \$:** Unknown but greater than \$50,000  
**Investigation Responsibility:**     State     PHMSA     NTSB     Other \_\_\_\_\_

| <i>Company Reported Apparent Cause:</i> | <i>Company Reported Sub-Cause (from PHMSA Form 7000-1/7100.2):</i>  |
|---|---|
| Corrosion                               |   |
| Natural Force Damage                    |   |
| Excavation Damage                       |   |
| Other Outside Force Damage              |   |
| Material Failure (Pipe, Joint, Weld)    |   |
| Equipment Failure                       | <b>X - 6 feet of Snow shoveled off roof on top and beside meter</b> |
| Incorrect Operation                     |   |
| Other                                   |   |

| <i>Accident/Incident Resulted in (check all that apply):</i> | <i>Comments:</i>  |
|--|---|
| Rupture <b>NO</b>  |   |
| Leak <b>YES</b>  | <b>Service line piping partially broken on upstream side of the meter</b> |
| Fire <b>YES</b>  |   |
| Explosion <b>YES</b>   | <b>Homeowner confirmed there was a minor explosion</b>                    |
| Evacuation <b>YES</b>  | Number of Persons    Area: <u>0</u> residence <u>3</u>                    |

| <i>Narrative Summary</i>   |
|--|
| Short summary of the Incident/Accident scenario  |
| <p>The homeowner's grandson had shoveled snow off of the roof on 02/19/2015 resulting in a large accumulation of snow (approximately 6 feet tall) on top of the gas meter and riser. On 02/20/2015 at 7:57am the homeowner called Unitil with an odor complaint. The homeowner then turned on garbage disposal (electric) which in all likelihood appears to have been the ignition source. A minor explosion occurred within the kitchen. The homeowner suffered minor burns near eyebrows, was treated on site and was subsequently released by the local fire department. The homeowner refused medical treatment at nearby medical center. A house fire ensued and fire damage was found inside the residence with burn patterns on basement joists and the outside vinyl siding consistent with fire from source location. On 02/20/2015 post explosion and fire, the gas meter was observed by the Safety Division to be cocked and no longer straight with burn patterns on the adjacent siding appearing to emanate from the top of the gas meter.</p> |

**State:** NH      **Reviewed by:** R Knepper  
**Principal Investigator:** J Vercellotti      **Title:** Director of Safety  
**Date:** February 20, 2015 – March 12, 2015      **Date:** After March 12 2015

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| <i>Failure Location &amp; Response</i>  |   |  |  |
|---|---|--|--|
| Location (City, Township, Range, County/Parish):<br><b>Hampton, NH 03842</b>  |   |  | (Acquire Map)                              |
| Address:<br><b>68 Locke Rd</b>  | Type of Area (Rural, City):<br><b>Suburban Neighborhood</b> |  |  |
| Coordinates of failure location (Latitude):   |   | <b>42.935055</b>   | (Longitude): <b>-70.820033</b>             |
| Date: <b>February 20 2015</b>   |   | Time of Failure: <b>Between 5 pm Feb 19 and 6:44 am Feb 20</b> |  |
| Time Detected: <b>7:57 am on February 20, 2015</b>  |   | Time Located: <b>8:15 am, at time of arrival of Hampton FD</b> |  |
| How Located: <b>Following ignition the Hampton FD arrived on scene, a house fire was underway. Unitil personnel shut off the gas meter riser valve at the outside southern wall of residence.</b>   |   |  |  |
| NRC Report #: <b>1108592</b>  | (Attach Report)   | Time Reported to NRC:<br><b>10:25 am</b>                       | Reported by:<br><b>Stacy Kilroy, Until</b> |
| <b>Type of Pipeline:</b><br><input type="checkbox"/> Liquid Propane<br><input type="checkbox"/> Municipal<br><input checked="" type="checkbox"/> Public Utility<br><input type="checkbox"/> Master Meter  |   |  |  |
| Pipeline Configuration (Regulator Station, Pump Station, Pipeline, etc.):<br><b>See Attachment 1 Unitil Data Request 1-6 Attachment A - Pressure Test &amp; Abandonment Service Card for 68 Locke Rd. Note the service consisted of a 0.5 inch diameter HDPE gas pipe fed from an HDPE main on Edgewood Drive. The service transitioned to a ¾" anodeless riser and transitioned to ¾" threaded coupling after the riser valve.</b> |   |  |  |

| <i>Operator/Owner Information</i>   |   |
|---|---|
| Owner: <b>Unitil</b><br>Address: <b>6 Liberty Lane West</b><br><b>Hampton NH 03842</b>  | Operator: <b>Northern Utilities</b><br>Address: <b>325 West St</b><br><b>Portsmouth , NH 03801</b>                            |
| Company Official: <b>Tom Meissner Chief Operating Officer</b><br>Phone No.: <b>(603) 227-4515</b> Fax No.: <b>(603)227-4544</b> | Company Official: <b>Chris Leblanc, Director of Operations</b><br>Phone No. <b>(603)294-5166</b> Fax No. <b>(603)294-5228</b> |
| <u>Drug and Alcohol Testing Program Contacts</u>  |   |
| Drug Program Contact & Phone:<br>Alcohol Program Contact & Phone:   |   |
| <b>X N/A</b>  |   |

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| <i>Damages</i>  |  |                                   |  |
|---|--|-----------------------------------|--|
| Gas Loss or Spill <sup>0</sup>  | <b>Estimate to be provided by Unutil</b> | Estimated Property Damage \$ >50K |  |
| Estimated Amount \$   | <b>To be provided by Unutil</b>          | Associated Damages \$             |  |
| Description of Property Damage:<br><b>Exterior siding and interior structural fire with burns throughout the basement and first floor of two story home. The firefighting effort also required removing the windows to provide smoke ventilation.</b> |  |                                   |  |
| Customers out of Service: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No            Number: 1  |  |                                   |  |
| Suppliers out of Service: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No            Number:  |  |                                   |  |

| <i>Fatalities and Injuries</i>                  |   |  |                      |                                     |                     | ___ N/A |
|---|---|--|----------------------|-------------------------------------|---------------------|---------|
| Fatalities:                                     | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | Company: <b>None</b> | Contractor: <b>None</b>             | Public: <b>None</b> |         |
| Injuries - Hospitalization:                     | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | Company: <b>None</b> | Contractor: <b>None</b>             | Public: <b>None</b> |         |
| Injuries - Non-Hospitalization:                 | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | Company: <b>None</b> | Contractor: <b>None</b>             | Public: <b>1</b>    |         |
| Total Injuries (including Non-Hospitalization): |   |  | Company: <b>None</b> | Contractor: <b>None</b>             | Public: <b>1</b>    |         |
| Name  | Job Function / Address                  | Yrs. w/ Comp.                          | Yrs. Exp.            | Type of Injury                      |                     |         |
| <b>George H Brown</b>                           | <b>Home owner/ 68 Locke Rd</b>          |  |                      | <b>Minor Burns to face and arms</b> |                     |         |
|   |   |  |                      |                                     |                     |         |
|   |   |  |                      |                                     |                     |         |

| <i>Drug/Alcohol Testing</i>  |                  |          |         |     | <input checked="" type="checkbox"/> N/A |
|--|------------------|----------|---------|-----|---|
| Were all employees that could have contributed to the incident, post-accident tested within the 2 hour time frame for alcohol or the 32 hour time frame for all other drugs?<br><input type="checkbox"/> Yes <input type="checkbox"/> No |                  |          |         |     |   |
| Job Function   | Test Date & Time | Location | Results |     | Type of Drug                            |
|  |                  |          | Pos     | Neg |   |
|  |                  |          |         |     |   |
|  |                  |          |         |     |   |
|  |                  |          |         |     |   |

| <i>System Description</i>   |
|---|
| Describe the Operator's System:<br><b>The Unutil Hampton Intermediate Pressure System is a natural gas distribution system that operates at 45 psig MAOP and is fed from the Exeter Hampton Rd Regulating Station and feeds the majority of customers in Hampton. The inlet feed on Exeter Hampton Rd is a one way radial feed having a 171 psig MAOP. The Hampton Intermediate Pressure System is comprised of approximately 40 streets and x miles of main and # of Services feeding Y customers.</b> |

| <i>Pipe Failure Description</i> | ___ N/A |
|---------------------------------|---------|
|                                 |         |

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| <i>Pipe Failure Description</i>   |  | ___ N/A |
|---|--|---------|
| Length of Failure (inches, feet, miles): <b>1.2 inches (assumes 50% of circumference of ¾ inch diameter fitting)</b>  |  | (1)     |
| Position (Top, Bottom, include position on pipe, 6 O'clock): (1)<br><b>Above ground steel fitting on inlet side of residential meter set in a vertical position. (see photo) Approximately at 9 o'clock position.</b>   | Description of Failure (Corrosion Gouge, Seam Split): (1)<br><b>Pipe failure at threaded fitting at the top of the service riser prior to the meter.</b>   |         |
| Laboratory Analysis: ___ Yes ___X_ No   |  |         |
| Performed by:   |  |         |
| Preservation of Failed Section or Component: ___X_ Yes ___ No   |  |         |
| If Yes - Method:  | <b>Unitil cut out the effected section of riser piping with the meter and a section of downstream piping. The components were tagged, transferred and stored under a Chain of Custody at the NEFCO warehouse in Rochester, NH.</b> |         |
| In Custody of: <b>NEFCO Fire Investigations, 1 Pickering Rd, Rochester, NH 03839</b>  |  |         |
| Develop a sketch of the area including distances from roads, houses, stress inducing factors, pipe configurations, direction of flow, etc. Bar Hole Test Survey Plot, if included, should be outlined with concentrations at test points.<br><b>See Attachment 2, Unitol Request 1-6 Attachment H - Leak Investigation</b><br><b>See Attachment 3, Unitol Request 1-7 Attachment A - GIS of Mains and Buildings in area (swing ties to main)</b><br><b>See Attachment 4, Unitol Request 1-13 Attachment B- Meter Set (with bill of materials)</b> |  |         |

| <i>Component Failure Description</i>                                      |   | ___ N/A |
|---|---|---------|
| Component Failed:   | <b>Pipe nipple ¾ Grade 40 at the threads that are used in meter fit-up for a single meter residential meter bar</b> |         |
| Manufacturer: <b>Central Plastics Company</b>                             | Model: <b>6470191 A</b>   |         |
| Pressure Rating: <b>100 psig</b>  | Size: <b>¾" Threaded fitting</b>  |         |
| Other (Breakout Tank, Underground Storage): <b>with Sprague Regulator</b> |   |         |

| <i>Pipe Data</i>  |   | ___ N/A |
|---|---|---------|
| Material: <b>Ap5L or ASTM A53 Steel</b>                       | Wall Thickness/SDR: <b>Schedule 40</b>        |         |
| Diameter (O.D.): <b>¾ -inch</b>                               | Installation Date: <b>06/10/2010</b>          |         |
| SMYS : <b>53,000 psi</b>                                      | Manufacturer: <b>Central Plastics Company</b> |         |
| Longitudinal Seam: <b>none</b>                                | Type of Coating: <b>none</b>                  |         |
| Pipe Specifications (API 5L, ASTM A53, etc.): <b>ASTM A53</b> |   |         |

| <i>Joining</i>                       |  | ___ N/A |
|--------------------------------------|--|---------|
| Type: <b>Threaded</b>                | Procedure: <b>Dope with Threaded Fitting</b> |         |
| NDT Method: <b>Factory Assembled</b> | Inspected: ___ Yes ___X_ No                  |         |

| <i>Pressure @ Time of Failure</i> |                | ___ N/A |
|-----------------------------------|----------------|---------|
| Pressure @ Failure Site:          | <b>40 psig</b> |         |

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| <i>Pressure @ Time of Failure</i> <span style="float: right;">___ N/A</span> |                 |
|--|-----------------|
| Location Relative to Failure Site  | Pressure (psig) |
| <b>Main 2" HDPE plastic</b>  | <b>40 psig</b>  |
|  |                 |
|  |                 |

| <i>Upstream Compressor Station Data</i> <span style="float: right;">X N/A</span> |                           |
|--|---------------------------|
| Pressure @ Time of Failure ( <b>Error! Bookmark not defined.</b> )               | Distance to Failure Site: |
| High Pressure Set Point:   | Low Pressure Set Point:   |

| <i>Operating Pressure</i> <span style="float: right;">___ N/A</span>   |  |
|--|--|
| Max. Allowable Operating Pressure: <b>45 psig MAOP</b>   | Determination of MAOP: <b>Record Review</b>  |
| Actual Operating Pressure: <b>40 psig</b>  |  |
| Method of Over Pressure Protection: <b>Regulator Station for Main and Service and Service Regulator for House Piping</b> |  |
| Relief Valve Set Point: <b>Not Applicable</b>  | Capacity Adequate? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |

| <i>Integrity Test After Failure</i> <span style="float: right;">___ N/A</span>   |  |
|--|--|
| Pressure test conducted in place? (Conducted on Failed Components or Associated Piping): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |  |
| If No, tested after removal? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   |  |
| Method: <b>GER0042015-01 and Meter Test handout of February 27, 2015 in Rochester New Hampshire at NEFCO warehouse.</b>  |  |
| Describe any failures during the test. <b>Pressure Test Failed (Blowing Gas at Nipple) Leak Rate at Pressure Test Conditions at 40 psig was estimated to be 1442 cfh without excess flow valve in place.</b> |  |

| <i>Soil/water Conditions @ Failure Site</i> <span style="float: right;">___ N/A</span>   |   |
|--|---|
| Condition of and Type of Soil around Failure Site (Color, Wet, Dry, Frost Depth):<br><b>Digging was in frozen ground covered with frost depth 10 inches at the main and zero inches adjacent to the house.</b> |   |
| Type of Backfill (Size and Description): <b>Sandy Well Draining Soil</b>   |   |
| Type of Water (Salt, Brackish): <b>Groundwater is freshwater does not appear to be involved in incident.</b>   | Water Analysis <sup>(1)</sup> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |

| <i>External Pipe or Component Examination</i> <span style="float: right;">___ N/A</span>   |  |
|--|--|
| External Corrosion? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <sup>(1)</sup>   | Coating Condition (Disbonded, Non-existent): <b>Painting (Fair)</b> <sup>(1)</sup> |
| Description of Corrosion:<br><b>Light Surface Oxidation</b>  |  |
| Description of Failure Surface (Gouges, Arc Burns, Wrinkle Bends, Cracks, Stress Cracks, Chevrons, Fracture Mode, Point of Origin): <b>Fracture at threaded fitting approximately 50% of circumference</b> |  |



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| <i>Outside Force Damage</i>   |  | <i>X_ N/A</i> |
|---|--|---------------|
|   |  |               |
| One Call Name: PA One Call  | One Call Report # <sup>0</sup>   |               |
| Notice Date:  | Time:  |               |
| Response Date:  | Time:  |               |
| Details of Response:  |  |               |
| Was Location Marked According to Procedures? <input type="checkbox"/> Yes <input type="checkbox"/> No                                 |  |               |
| Pipeline Marking Type: <sup>(1)</sup>   | Location: <sup>(1)</sup>   |               |
| State Law Damage Prevention Program Followed? <input type="checkbox"/> Yes <input type="checkbox"/> No                                |  |               |
| Notice Required: <input type="checkbox"/> Yes <input type="checkbox"/> No   | Response Required: <input type="checkbox"/> Yes <input type="checkbox"/> No    |               |
| Was Operator Member of State One Call? <input type="checkbox"/> Yes <input type="checkbox"/> No                                       | Was Operator on Site? <input type="checkbox"/> Yes <input type="checkbox"/> No |               |
| Did a deficiency in the Public Awareness Program contribute to the accident? <input type="checkbox"/> Yes <input type="checkbox"/> No |  |               |

| <i>Natural Forces</i>                                 | <i>_X_ N/A</i> |
|---|----------------|
| Description (Earthquake, Tornado, Flooding, Erosion): |                |

| <i>Failure Isolation</i>  |   | <i>_ N/A</i>   |
|---|---|----------------|
| Squeeze Off/Stopple Location and Method: <b>Upstream: Riser Valve</b> |   | <sup>(1)</sup> |
| Valve Closed - <b>Upstream: Riser Valve</b><br>Time: <b>8:35 AM</b>   | I.D. :<br>Address: <b>68 Locke Rd Meter Set</b> |                |
| Valve Closed - Downstream: <b>None</b><br>Time:                       | I.D.:<br>Address:                               |                |

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| <i>Failure Isolation</i> <span style="float: right;">__ N/A</span>  |                                      |
|---|--------------------------------------|
| Pipeline Shutdown Method: <input checked="" type="checkbox"/> Manual <input type="checkbox"/> Automatic <input type="checkbox"/> SCADA <input type="checkbox"/> Controller <input type="checkbox"/> ESD |                                      |
| Failed Section Bypassed or Isolated: <b>Isolated</b>  |                                      |
| Performed By: <b>Chris Silver, Unitil Distribution Tech</b>   | Valve Spacing: <b>Not Applicable</b> |

| <i>Odorization</i> <span style="float: right;">__ N/A</span>   |   |
|--|---|
| Gas Odorized: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  | Concentration of Odorant (Post Incident at Failure Site) <b>.05%</b> :  |
| Method of Determination: <input type="checkbox"/> Yes <input type="checkbox"/> No  | % LEL: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   % Gas In Air: <input type="checkbox"/> Yes <input type="checkbox"/> No |
| 11% Gas in Air at Building   | Time Taken: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <b>15:04 on 2/20/15</b>   |
| Was Odorizer Working Prior to the Incident?<br><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   | Type of Odorizer (Wick, By-Pass):   |
| Odorant Manufacturer:<br>Model:  | Type of Odorant:  |
| Amount Injected:   | Monitoring Interval (Weekly):   |
| Odorization History (Leaks Complaints, Low Odorant Levels, Monitoring Locations, Distances from Failure Site):<br><b>Unitil receives odorized gas from transmission companies and monitors the odorant levels throughout the distribution system on a monthly basis.</b> |   |

| <i>Weather Conditions</i> <span style="float: right;">__ N/A</span>  |  |
|--|--|
| Temperature: <b>approximately 5 deg F</b>  | Wind (Direction & Speed): <b>17 MPH Westerly with 27 MPH Gusts</b> |
| Climate (Snow, Rain): <b>None</b>  | Humidity: <b>50%</b>   |
| Was Incident preceded by a rapid weather change? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                 |  |
| Weather Conditions Prior to Incident (Cloud Cover, Ceiling Heights, Snow, Rain, Fog):<br><b>Partially Cloudy some periods of sun</b> |  |

| <i>Gas Migration Survey</i> <span style="float: right;">__ N/A</span>  |   |
|--|---|
| Bar Hole Test of Area: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   | Equipment Used: <b>Bar Hole and CGI</b> |
| Method of Survey (Foundations, Curbs, Manholes, Driveways, Mains, Services) <sup>(1)</sup><br><b>Foundations and Mains (12 House Test) See Attachment 2 Unitil Request 1-6 Attachment H gas migration survey sketch.</b> |   |

| <i>Pressure Test History</i> <span style="float: right;">__ N/A</span><br>(Expand List as Necessary) |                  |             |                 |                 |
|--|------------------|-------------|-----------------|-----------------|
|  | Test Date        | Test Medium | Pressure (psig) | Duration (hrs)  |
| Installation   | <b>6/10/2010</b> | <b>Air</b>  | <b>150</b>      | <b>1/3</b>      |
| Next   |                  |             |                 |                 |
| Next   |                  |             |                 |                 |
| Most Recent  | <b>2/20/2015</b> | <b>Air</b>  | <b>60</b>       | <b>23 (Min)</b> |



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|   |
|---|
| <b>Pressure Test History</b> <span style="float: right;">__ N/A</span><br><i>(Expand List as Necessary)</i> |
|---|

Describe any problems experienced during the pressure tests.  
**The day of the incident the service piping was pressure tested between the main and the service riser valve and no leaks were detected. (See Attachment 1, Unitil Request 1-6, Attachment A)**

|  |
|--|
| <b>Internal Line Inspection/Other Assessment History</b> <span style="float: right;">X N/A</span><br><i>(Expand List as Necessary)</i> |
|--|

|             | Assessment Date | Type of ILI Tool <sup>0</sup> | Other Assessment Method <sup>0</sup> | Indicated Anomaly<br>If yes, describe below |
|-------------|-----------------|-------------------------------|--------------------------------------|---|
| Initial     |                 |                               |                                      | __ Yes __ No                                |
| Next        |                 |                               |                                      | __ Yes __ No                                |
| Next        |                 |                               |                                      | __ Yes __ No                                |
| Most Recent |                 |                               |                                      | __ Yes __ No                                |

Describe any previously indicated anomalies at the failed pipe, and any subsequent pipe inspections (anomaly digs) and remedial actions.

|  |
|--|
| <b>Pre-Failure Conditions and Actions</b> <span style="float: right;">_X_ N/A</span> |
|--|

Was there a known pre-failure condition requiring <sup>(10)</sup> the operator to schedule evaluation and remediation?  
 \_\_ Yes (describe below or on attachment) \_\_ No

If there was such a known pre-failure condition, had the operator established and adhered to a required <sup>(10)</sup> evaluation and remediation schedule? Describe below or on attachment. \_\_ Yes \_\_ No \_\_ N/A

Prior to the failure, had the operator performed the required <sup>(10)</sup> actions to address the threats that are now known to be related to the cause of this failure? \_\_ Yes \_\_ No \_\_ N/A  
 List below or on an attachment such operator-identified threats, and operator actions taken prior to the accident.

Describe any previously indicated anomalies at the failed pipe, and any subsequent pipe inspections (anomaly digs) and remedial actions.

|   |
|---|
| <b>Maps &amp; Records</b> <span style="float: right;">__ N/A</span> |
|---|

Are Maps and Records Current?  Yes  No

Comments: **(See Attachment 3, Unitil Request 1-7 Attachment A)**

|  |
|--|
| <b>Leak Survey History</b> <span style="float: right;">__ N/A</span> |
|--|

Leak Survey History (Trend Analysis, Leak Plots):

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|  |
|--|
| <i>Leak Survey History</i> <span style="float: right;">___ N/A</span>  |
| See Attachment 5 Unitil Request 1-6 Attachment C - Service Leak Survey Records and Attachment 6 Unitil Request 1-6 Attachment D - Main Leak Survey Records |

|  |
|--|
| <i>Pipeline Operation History</i> <span style="float: right;">___ N/A</span>   |
| Description (Repair or Leak Reports, Exposed Pipe Reports):<br>The meter was relocated to the exterior on 6/17/2010. On 2/14/2011 an outside leak at the meter was repaired. On 3/29/2011 a leak at the meter fit was repaired. On 6/14/2011 an odor complaint was received and a leak was not detected, (See Attachment 7 Unitil Request 1-6 Attachment J - MDS Work Order 2011 Leak Investigation) |
| Did a Safety Related Condition Exist Prior to Failure? ___ Yes <input checked="" type="checkbox"/> No      Reported? ___ Yes ___ No  |

|   |                      |                  |                                |       |
|---|----------------------|------------------|--------------------------------|-------|
| <i>Operator/Contractor Error</i> <span style="float: right;"><input checked="" type="checkbox"/> N/A</span>                         |                      |                  |                                |       |
| Name:   | Job Function:        |                  |                                |       |
| Title:  | Years of Experience: |                  |                                |       |
| Training (Type of Training, Background):  |                      |                  |                                |       |
| Was the person "Operator Qualified" as applicable to a precursor abnormal operating condition? ___ Yes ___ No ___ N/A               |                      |                  |                                |       |
| Was qualified individual suspended from performing covered task ___ Yes ___ No ___ N/A  |                      |                  |                                |       |
| Type of Error (Inadvertent Operation of a Valve):   |                      |                  |                                |       |
| Procedures that are required:   |                      |                  |                                |       |
| Actions that were taken:  |                      |                  |                                |       |
| Pre-Job Meeting (Construction, Maintenance, Blow Down, Purging, Isolation):   |                      |                  |                                |       |
| Prevention of Accidental Ignition (Tag & Lock Out, Hot Weld Permit):  |                      |                  |                                |       |
| Procedures conducted for Accidental Ignition:   |                      |                  |                                |       |
| Was a Company Inspector on the Job? ___ Yes ___ No  |                      |                  |                                |       |
| Was an Inspection conducted on this portion of the job? ___ Yes ___ No  |                      |                  |                                |       |
| Additional Actions (Contributing factors may include number of hours at work prior to failure or time of day work being conducted): |                      |                  |                                |       |
| Training Procedures:  |                      |                  |                                |       |
| Operation Procedures:   |                      |                  |                                |       |
| Controller Activities:  |                      |                  |                                |       |
| Name  | Title                | Years Experience | Hours on Duty Prior to Failure | Shift |
|   |                      |                  |                                |       |
|   |                      |                  |                                |       |
|   |                      |                  |                                |       |

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| <i>Operator/Contractor Error</i>                     |  |  |  | <b>X_ N/A</b> |
|--|--|--|--|---------------|
|  |  |  |  |               |
|  |  |  |  |               |
| Alarm Parameters:                                    |  |  |  |               |
| High/Low Pressure Shutdown:                          |  |  |  |               |
| Procedures for Clearing Alarms:                      |  |  |  |               |
|  |  |  |  |               |
| Type of Alarm:                                       |  |  |  |               |
| Company Response Procedures for Abnormal Operations: |  |  |  |               |
|  |  |  |  |               |
| Additional Actions:                                  |  |  |  |               |
|  |  |  |  |               |

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### Additional Actions Taken by the Operator

\_\_\_N/A

Make notes regarding the emergency and Failure Investigation Procedures (Pressure reduction, Reinforced Squeeze Off, Clean Up, Use of Evacuators, Line Purging, closing Additional Valves, Double Block and Bleed, Continue Operating downstream Pumps):

Unitil implemented O&M procedure “2-T Emergency Actions” to respond to the incident, procedure “1-E Failure Investigation” to investigate the failure and procedure “1-H” for reporting the incident.

### Photo Documentation <sup>(1)</sup>

Overall Area from best possible view. Pictures from the four points of the compass. Failed Component, Operator Action, Damages in Area, Address Markings, etc. (See Attachment 8 - 68 Locke Rd Hampton Photo Log)

| Photo No. | Description  | Photo No. | Description |
|-----------|--|-----------|-------------|
| 1         | View from Locke Rd of the east side of the residence.  | 16        |             |
| 2         | View from Edgewood Dr. of the south side of the residence with the meter located behind the high snow bank.  | 17        |             |
| 3         | The top of the meter set visible under the snow bank at the base of the charred siding.  | 18        |             |
| 4         | The view of the meter set after the snow was removed.  | 19        |             |
| 5         | The cracked thread at the top of the service riser on the upstream side of the meter set.  | 20        |             |
| 6         | The service piping was pressure tested between the main and the riser valve at 62 psi for a 20 minute period.  | 21        |             |
| 7         | Basement view of charred support beams where the gas piping entered the south building wall.   | 22        |             |
| 8         | The kitchen area where the homeowner activated an electric garbage disposal that ignited gas under the sink.   | 23        |             |
| 9         | Fire damage observed adjacent to the southwest wall of the living room in the vicinity of the underlying gas service piping entrance to the residence. | 24        |             |
| 10        | The meter set was pressure tested on 02/26/2015 at the NEFCO laboratory in Rochester, NH.  | 25        |             |

## Distribution Incident Investigation Report

|                                       |  |    |  |
|---------------------------------------|--|----|--|
| 11                                    |  | 26 |  |
| 12                                    |  | 27 |  |
| 13                                    |  | 28 |  |
| 14                                    |  | 29 |  |
| 15                                    |  | 30 |  |
| Camera Type: Kodak Easy Share Z1012IS |  |    |  |

| <i>Additional Information Sources</i> |  |                                  |                       |
|---------------------------------------|--|----------------------------------|-----------------------|
| Agency                                | Name                                     | Title                            | Phone Number          |
| Police:                               |  |                                  |                       |
| Fire Dept.:                           | <b>Scott Steele</b>                      | <b>Hampton Fire Investigator</b> | <b>(603) 929-1919</b> |
| State Fire Marshall:                  |  |                                  |                       |
| State Agency:                         |  |                                  |                       |
| NTSB:                                 |  |                                  |                       |
| FBI:                                  |  |                                  |                       |
| ATF:                                  |  |                                  |                       |
| OSHA:                                 |  |                                  |                       |
| Insurance Co.:                        |  |                                  |                       |
| Television:                           |  |                                  |                       |
| Newspaper:                            |  |                                  |                       |
| Other:                                |  |                                  |                       |
| <i>Persons Interviewed</i>            |  |                                  |                       |
| Name                                  | Title                                    | Phone Number                     |                       |
| <b>George Brown</b>                   | <b>Home owner</b>                        | <b>603 205 2028</b>              |                       |
|                                       |  |                                  |                       |
|                                       |  |                                  |                       |
| <b>Dan Lafortune</b>                  | <b>Service Technician First Class</b>    | <b>603 294-5140</b>              |                       |
| <b>Chris Silver</b>                   | <b>Distribution Operator First Class</b> | <b>603 294-5140</b>              |                       |
| <b>Jeff Croteau</b>                   | <b>Service Technician First Class</b>    | <b>603 294-5140</b>              |                       |
|                                       |  |                                  |                       |
|                                       |  |                                  |                       |
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|                                       |  |                                  |                       |
|                                       |  |                                  |                       |

## ***Distribution Incident Investigation Report***

| <b><i>Event Log</i></b>   |   |
|---|---|
| Sequence of events prior, during, and after the incident by time. (Consider the events of all parties involved in the incident, Fire Department and Police reports, Operator Logs and other government agencies.) |   |
| Time / Date   | Event   |
| 6:44 2/20/15  | Gas outside odor call reported at 10 Bradstreet – Hampton, NH   |
| 6:47 2/20/15  | Unitil Tech Daniel LaFortune – Unitil First Responder was notified by Gas Control of odor complaint at 10 Bradstreet Road.  |
| 7:25 2/20/15  | Unitil Tech Dan LaFortune Arrives on scene and checks with the homeowner and begins outside leak investigation.<br>Found no gas readings, so called Gas Control requesting additional help from Chris Silver (leak survey)  |
| 7:45 2/20/15  | Unitil Tech Chris Silver dispatched to location from the Portsmouth office to provide assistance to Dan LaFortune.  |
| 7:54-57 2/20/15   | The customer at 68 Locke Road made (3) calls with details as follows:<br>Call 1 – Was initiated at the Call Center at 7:54:15 and the customer disconnected the call at 7:54:17.<br>Call 2 – Was initiated at the Call Center at 7:56:23 and the customer disconnected the call at 7:56:25<br>Call 3 – Was initiated at the Call Center 7:57:10 and was automatically routed to our Field Services Group, located in our Gas Control Center, because of heavy call volume at our Call Center. This is a normal routing protocol to ensure all emergency calls are answered promptly. Field Services is staffed from 06:00 to 08:00 by a Field Services Supervisor and from 08:00 to 16:00 by Field Services Staff. The call was routed to Field Services at 7:57:22 and was answered by our Field Services Supervisor. At the time of this call the line utilized by the Field Supervisor was not being recorded. |
| 8:01 2/20/15  | Unitil Tech Jeff Croteau notified by gas control of odor complaint at 68 Locke Road, Hampton.   |
| 8:03 2/20/15  | Unitil Tech Chris Silver Arrives at Locke Road to assist Dan LaFortune and begins leak surveying.   |
| 8:03-11 2/20/15   | Ignition occurred at 68 Locke Road between 08:03 and 08:11, when the Hampton Fire Department was notified.  |
| 8:11 2/20/15  | Call for Hampton Fire Department 911<br>Unitil Tech Chris Silver reached the intersection of Locke Road and Edgewood and is flagged down by the occupant of 68 Locke Road daughter and informed of the ignition. Chris was also notified that the Hampton Fire Department was also called.<br>Chris notified Dan LaFortune of the situation and requested assistance.<br>Chris began to suit up with his Level II FR clothing and began attempted to gain access to the outside meter location.   |
| 8:15 2/20/15  | Hampton Fire Department arrives on scene and assumes control of the emergency response activities.  |
| 8:17 2/20/15  | Chris Silver contacts Distribution Supervisor Joe Fitzpatrick to inform him of the situation.<br>Joe notifies Mel Ciulla, Manager, Gas Distribution, and dispatches a street crew to the location.<br>Joe instructs Chris Silver to get the backhoe to assist with snow removal of the meter set etc. Chris Returns after backhoe would not start.  |
| 8:18 2/20/15  | Jeff Croteau, the 1st Responder dispatched to the odor complaint at 68 Locke Road arrives on scene and begins to assist with emergency response.  |
| 8:35 2/20/15  | Gas Supply to the service was shut off at the riser valve.  |
| 8:45 2/20/15  | Distribution Techs Gregg Chaput & Reggie McQuate arrive at the scene.   |
| 8:50-55 2/20/15   | Unitil Supervisors, Joe Fitzpatrick and Bob Lundergan, arrive at the scene at 08:50 and 08:55 respectively.<br>Joe assumes supervisory duties over the Distribution Crews and Bob assumes supervisory duties over the Service Technician's conducting leak investigations.  |
| 9:00-13:30<br>2/20/15   | First Responders (i.e. service technician's) continued leak investigations of the surrounding houses 09:00 – 13:30.<br>Distribution Crews remained on stand-by for assistance to the Hampton Fire Department as requested.  |

## ***Distribution Incident Investigation Report***

| <b><i>Event Log</i></b>   |         |   |
|---|---------|---|
| Sequence of events prior, during, and after the incident by time. (Consider the events of all parties involved in the incident, Fire Department and Police reports, Operator Logs and other government agencies.) |         |   |
| 9:15  | 2/20/15 | Tom Gatherum – Christina Guay    Unitil’s Loss Control personnel arrive at the scene.                             |
| 9:30  | 2/20/15 | Mel Ciulla, Unitil Manager, Gas Distribution arrives at the scene.  |
| 10:30   | 2/20/15 | Randy Knepper – Joe Vercellotti    NH PUC arrives at the scene.   |
| 10:30   | 2/20/15 | NEFCO Investigator – Tom Bush    NEFCO Fire Investigator arrives at the scene.                                    |
| 13:30-17:00<br>2/20/15  |         | Unitil began excavating the tap at the main and the riser for pressure testing and removal of the meter assembly. |
|   |         |   |
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|   |         |   |

## ***Distribution Incident Investigation Report***

| <b><i>Investigation Contact Log</i></b> |      |                   |  |
|---|------|-------------------|--|
| Time                                    | Date | Name              | Description                                  |
|   |      | Mel Ciulla        | Manager, Gas Distribution                    |
|   |      | Bob Lundergan     | Supervisor, Gas Service                      |
|   |      | Joe Fitzpatrick   | Supervisor, Gas Distribution                 |
|   |      | Chris Silver      | Distribution Technician 1st Class            |
|   |      | Dan Lafortune     | Service Technician 1st Class                 |
|   |      | Jeff Crouteau     | Service Technician 1st Class                 |
|   |      | Bob Allen         | Distribution Technician 1st Class            |
|   |      | Reggie McQuate    | Distribution Technician 1st Class            |
|   |      | Chris Difrancesco | Distribution Technician 2nd Class            |
|   |      | Grag Chaput       | Distribution Technician 1st Class            |
|   |      | Henry Deamon      | Oversight of NEUCO personnel 7 people shovel |
|   |      |                   |  |

| <b><i>Failure Investigation Documentation Log</i></b> |  |          |        |       |
|---|--|----------|--------|-------|
| Operator: Northern Utilities (Unitil)                 |  | Unit #:  | CPF #: | Date: |
| Appendix<br>Number                                    | Documentation Description  | Date     | FOIA   |       |
|   |  | Received | Yes    | No    |
| Attachment 1  | Unitil Request 1-6 Attachment A - Pressure Test & Abandonment            |          |        |       |
| Attachment 2  | Unitil Request 1-6 Attachment H - Leak Investigation                     |          |        |       |
| Attachment 3  | Unitil Request 1-7 Attachment A - GIS of Mains and Buildings in area     |          |        |       |
| Attachment 4  | Unitil Request 1-13 Attachment B – Meter Set 6470191 A                   |          |        |       |
| Attachment 5  | Unitil Request 1-6 Attachment C - Service Leak Survey Records            |          |        |       |
| Attachment 6  | Unitil Request 1-6 Attachment D - Main Leak Survey Records               |          |        |       |
| Attachment 7  | Unitil Request 1-6 Attachment J - MDS Work Order 2011 Leak Investigation |          |        |       |
| Attachment 8  | NHPUC 68 Locke Rd Hampton Photo Log                                      |          |        |       |
|   |  |          |        |       |
|   |  |          |        |       |
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