



The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC UTILITIES

PIPELINE ENGINEERING AND SAFETY DIVISION

INCIDENT REPORT

17 Danny Road, Hyde Park, Massachusetts

November 3, 2010

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NSTAR Gas Company

Estimated Property Damage: \$1,000,000*

Injuries: None

Report Issued – December 4, 2014

* Estimated by the Boston Fire Department

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I. INTRODUCTION

A. Scope of Investigation

The Massachusetts Department of Public Utilities (“Department”), Pipeline Engineering and Safety Division (“Division”), pursuant to G.L. c. 164, § 105A and a Federal Certification Agreement as provided for in 49 U.S.C. § 60105, has investigated a natural gas (“gas”) release at 17 Danny Road, Massachusetts on November 3, 2010 (“Incident”) (Exh. 1).¹ The release of gas contributed to an explosion, fire, and property damage to the dwelling (Exh. 1). The operator of the natural gas facilities at the Incident is NSTAR Gas Company (“NSTAR” or “Operator”) (Exh. 1). The Boston Fire Department estimated the damage at approximately \$1,000,000 (Exh. 2). There were no fatalities or injuries as a result of the explosion (Exh. 1).

As part of the Department’s annual certification process by the United States Department of Transportation (“U.S. DOT”), the Department must report to the U.S. DOT

¹ Incident means any of the following events:

- (1) An event that involves a release of gas from a pipeline, or of liquefied natural gas, liquefied petroleum gas, refrigerant gas, or gas from an LNG facility, and that results in one or more of the following consequences:
 - (i) A death, or personal injury necessitating in-patient hospitalization;
 - (ii) Estimated property damage of \$50,000 or more, including loss to the operator and others, or both, but excluding cost of gas lost;
 - (iii) Unintentional estimated gas loss of three million cubic feet or more;
- (2) An event that results in an emergency shutdown of an LNG facility. Activation of an emergency shutdown system for reasons other than an actual emergency does not constitute an incident.
- (3) An event that is significant in the judgment of the operator, even though it did not meet the criteria of paragraphs (1) or (2) of this definition.

each accident or incident . . . involving a fatality, personal injury requiring hospitalization, or property damage or loss of more than an amount the Secretary establishes... and any other accident the [Department] considers significant, and a summary of the investigation by the [Department] of the cause and circumstances surrounding the accident or incident.
49 U.S.C. § 60105(c).

The purpose of this report is to inform the U.S. DOT as to the cause and circumstances surrounding the Incident.

The Department has established procedures for determining the nature and extent of violations of codes and regulations pertaining to the safety of pipeline facilities and the transportation of gas, including but not limited to, 220 C.M.R. §§ 101.00 through 113.00. See 220 C.M.R. § 69.00 et seq. The Division also enforces the U.S. DOT safety standards for gas pipeline systems as set forth in 49 C.F.R. Part 192 ("Part 192").
G.L. c. 164, § 105A.

B. Overview of Incident

On November 3, 2010, DeFelice Corporation ("DeFelice," or "Excavator") was excavating on Danny Road, Hyde Park (Exh. 3). The excavation work was part of a water main replacement and rehabilitation project that DeFelice was performing on Reynold and Danny Road's under a contract with the Boston Water and Sewer Commission (Exh. 3). The major portion of the project consisted of installing approximately 440 feet of new water main under Reynold Road from the intersection with Chesterfield Street to the intersection of Como Road (Exh. 4).

On November 3, 2010, while operating an excavator machine along Danny Road, DeFelice hit and damaged a one (1) inch diameter NSTAR gas steel service (Exh. 2, 5(b)).

After the gas service was damaged, one of the crew members walked towards the house, smelled natural gas, and told the excavator operator about the conditions (Exh. 3). The excavator operator next severed the gas service, in order to vent the gas to the air (Exhs. 3, 5(b)). The excavator operator and the crew member walked towards the house and knocked on the door to see if anyone was home (Exh. 3). When no one answered, they walked away from the house (Exhs. 2, 3). Shortly afterwards, the house exploded (Exhs. 2, 3, 11, at 1-2). The excavator informed the Boston Fire Department that about 10 to 15 minutes had elapsed from when the gas service was damaged to when the house exploded (Exh. 2, at 1-2).

The first NSTAR personnel to arrive at the scene found the gas service leaking and that a broom stick handle had been jammed into the open end of the gas service that was still connected to the gas main. This had been done in an attempt to slow the escape of gas from the gas service (Exh. 8). The first NSTAR personnel to arrive onsite were able to stop the flow of gas by cutting and capping the gas service (Exh. 8).

II. THE DEPARTMENT'S INVESTIGATION

A. Description of the Site

Danny Road is located in a residential area of Hyde Park, Massachusetts. Most of the homes in the area are single family on individual lots (Exh. 5(a)). The structure at 17 Danny Road was a one story, single-family home. Gas was supplied to it through a one (1) inch diameter steel gas service that was installed in 1960 (Exh. 7). In the basement of the house, the gas service was connected to a service regulator, meter bar, and gas meter (Exh. 8).

The explosion completely destroyed the house (Exh 5(a)) and it also caused damage to eight other houses on Danny Road, Reynold Road and Chesterfield Street (Exh. 5(a)).

B. Emergency Response

The Boston Fire Department notified NSTAR of the explosion and fire at 17 Danny Road (Exh. 8). At approximately 8:52 a.m., NSTAR dispatched emergency response personnel to the site (Exh. 8). NSTAR personnel arrived on the scene at approximately 9:00 a.m. and found a broken one inch steel gas service supplying 17 Danny Road, to stop the flow of gas the broken gas service was plugged and capped (Exh. 5(c), 5(d), 8).

As a precaution and if required, NSTAR checked with their engineering division to determine if the gas main on Danny Road could be shut off from the gas mains located on Reynold Road and Readville Street (Exh. 8). The engineering division determined that this could be done without affecting the system (Exh. 8). NSTAR did not shut off the gas main as the Operator was able to disconnect the gas service at the connection to the gas main on Danny Road (Exh. 8).

NSTAR decided to shut off all gas services within 300 feet of 17 Danny Road (Exh. 8). This was completed at 11:30 a.m. (Exh. 8). The Boston Fire Department allowed NSTAR to begin restoring gas service to the effected customers at 2:00 p.m. (Exh. 8) and gas service to the affected customers was fully restored by 3:30 p.m. (Exh. 8).

C. The Gas Piping Under Danny Road

1. Description of the Gas Main Under Danny Road

The Operator installed a four (4) inch diameter steel gas main underlying the eastern side of Danny Road in 1960 (Exh. 6). The maximum operating pressure ("MAOP") of the gas main is 25 pounds per square inch gauge ("PSIG") (Exh. 7). NSTAR reported that the operating pressure of the main at the time of the Incident was 22 PSIG (Exh. 7).

In 1999, NSTAR installed a thirty three (33) foot section of two (2) inch diameter plastic gas main underlying the eastern side of Danny Road and a portion of Reynold Road (Exh. 6). This section of plastic gas main connected the Danny Road gas main to the gas main underlying Reynold Road (Exh. 6).

2. Description of the Gas Service supplying 17 Danny Road

In 1960, NSTAR installed a one (1) inch diameter forty four (44) foot long gas service constructed of bare steel pipe to supply 17 Danny Road (Exh. 7, 9(c),(d)). The Operator located the service regulator, meter bar, and gas meter in the basement of the house (Exh. 10). NSTAR located a gas service valve eighteen (18) feet, seven (7) inches from the foundation wall (Exh. 7) in the grass area between the sidewalk and street.

3. Leakage Surveys of the Gas Mains and Gas Services after the Incident

Following the Incident, NSTAR shut off gas service to all houses within 300 feet of 17 Danny Road (Exh. 8). NSTAR leak surveyed the area of Reynold Road and Danny Road and the Operator detected no gas leaks (Exh. 8).

III. EXCAVATION BY DEFELICE CORPORATION

The Boston Water and Sewer Commission awarded DeFelice a contract to replace or rehabilitate water, sewer and drain lines in Hyde Park (Exh. 3). The contract in Hyde Park included facilities on Reynold Road between Como Road and Chesterfield Street (Exhs. 3, 4). The plans also showed water drain pipe installation to be done on Danny Road (Exh. 3; Exh. 4).

DeFelice notified Dig Safe systems, Inc. ("Dig Safe") on October 1, 2010, before construction began (Exh. 3). The notification did not call for any markings to be placed on

Danny Road (Exh. 3 and Exh. 11, at 22-27). The area delineated by the Dig Safe ticket request from DeFelice was for Reynold Road from Chesterfield Street to Como Road, from the street to the property line including intersections (Exhs. 3, 11, at 22-27).

DeFelice began the work on October 22, 2010 (Exh. 3). The first part of the projected consisted of installing a temporary water main across Como Road, in front of 31 Como Road, and along Reynold Road to Chesterfield Street (Exhs. 3, 11). While installing this temporary main, DeFelice excavated across Como Road, outside of the area they had identified in their Dig Safe ticket where they would be excavating (Exh. 11, at 12-14). On November 2, 2010, DeFelice contacted Dig Safe, and requested a remark (Exhs. 2, 3). This second Dig Safe request did not mention Danny Road (Exh. 11 at 12-14).

On November 3, 2010, DeFelice began to excavate on Danny Road in an easterly direction (Exh. 3). Adjacent to the excavation and located in the grass area between the street and sidewalk was the gas service valve box for 17 Danny Road; 1 (Exhs. 9(a), 9(b), 11 at 32-33). The excavator damaged the one (1) inch gas service that was located approximately seventeen (17) feet beyond the property line of 17 Danny Road at the intersection of Danny Road and Reynolds Road (Exhs. 9(b), 11 at 25). After damaging the gas service, the DeFelice excavator operator began to hand dig around the damaged gas service, while another employee walked towards the house (Exh. 3). The employee smelled natural gas as he approached the house (Exh. 3). He immediately went back and told the excavator operator who was hand digging around the gas service (Exh. 3). The excavator operator pulled the gas service out of the ground in an attempt to vent the natural gas to the atmosphere (Exh. 3). Then both

DeFelice employees knocked on the door to see if anyone was inside (Exh. 3). As they walked away, shortly thereafter, the house exploded (Exhs. 2, 3).

IV. RECOVERED PIPE SECTIONS

Three sections of the gas service supplying 17 Danny Road were recovered from the scene. The first section was the section of the gas service that had been connected to the gas main in Danny Road (Exhs. 5(b), 9(b)). This section had been cut and capped by NSTAR to stop the flow of gas (Exh. 8).

The second section of the gas service was not capped it was partially located and buried in the sidewalk area (Exh. 5(b)). When NSTAR excavated and exposed this section of the gas service, the curb valve was found to be broken in two (Exh. 9(d)).

The third section of the gas service contained the other half of the broken curb valve and terminated in the basement of 17 Danny Road (Exh. 9(c)). Inside the basement of 17 Danny Road, the gas service had been connected to the service regulator, the gas service pipe was broken at this point (Exh. 10(a), (b)). Installed at the end of the gas service inside the basement was a service shut off valve that had been pulled against the foundation wall (Exh. 10(a)).

V. DIG SAFE VIOLATIONS

DeFelice made two calls to Dig Safe requesting markouts for the water and sewer job (Exh. 11, at 20). The first call was on October 1, 2010 (Exh. 3). The second was on November 2, 2010 (Exh. 3). Neither of these Dig Safe notifications requested any mark outs in front of Danny Road (Exh. 11, at 26).

The Department found that the Excavator failed to provide proper notification to Dig Safe Systems, Inc., pursuant to G.L. c. 82, § 40A, prior to DeFelice's excavation of the area on Danny Road (Exh. 11, at 22-26, 38). The Department further found that the Excavator violated the Dig Safe laws at G.L. c. 82, § 40C by failing to take reasonable precautions to avoid damage to NSTAR underground facilities at Danny Road (Exh. 11, at 38).

VI. FINDINGS

A. The Incident

1. The Boston Water and Sewer Commission awarded DeFelice a contract to replace or rehabilitate water, drain and sewer mains on Reynold Road in Hyde Park.
2. On October 1, 2010, DeFelice notified Dig Safe. The notification did not call for any markings to be placed on Danny Road. The area delineated by the Dig Safe ticket request from DeFelice was for Reynold Road from Chesterfield Street to Como Road, from the street to the property line including intersections.
3. On November 2, 2010, DeFelice notified Dig Safe again and asked for Reynold Road to be re-marked from Como Road to Chesterfield Street.
4. The October 1, 2010, Dig Safe Ticket notes that DeFelice stated that it would excavate only on Reynold Road, between the intersections of Como Road and Chesterfield Street in Hyde Park from the street to property line including intersections.
5. On November 3, 2010, DeFelice began excavating on Danny Road in Hyde Park, Massachusetts.
6. The DeFelice excavation on Danny Road extended approximately seventeen (17) feet beyond the property line of 17 Danny Road at the intersection of Danny Road and Reynold Road.
7. While excavating on Danny Road, DeFelice struck and damaged a buried gas service supplying 17 Danny Road.
8. After damaging the gas service a DeFelice employee walked towards the house and smelled a natural gas odor.

9. The excavator operator was told of the gas odor and decided to sever the gas service with the excavator to vent the gas to the atmosphere.
10. After severing the gas service the excavator operator and the crew member walked towards the house and knocked on the door to see if anyone was inside the house.
11. As the DeFelice employees walked away, shortly thereafter the house exploded.

B. The Gas Main and Gas Service Under Danny Road

1. NSTAR installed a four (4) inch diameter steel gas main underlying the eastern side of Danny Road in 1960.
2. In 1960, NSTAR installed a one (1) inch diameter steel gas service supplying 17 Danny Road.
3. The MAOP of the gas main was 25 psig.
4. The gas service regulator and the meter for 17 Danny Road were located inside the house.

C. The Recovered Pipe

1. Three sections of the gas service pipe were recovered from the scene:
 - The first section had been connected to the gas main in Danny Road and was cut and capped by NSTAR to stop the flow of gas.
 - The second section of the gas service was not capped it was partially located and buried in the sidewalk area. When NSTAR excavated and exposed this section of the gas service, the curb valve was found to be broken in two.
 - The third section of gas had the other half of the broken curb valve and terminated in the basement of 17 Danny Road. Inside the basement the gas service had been connected to the service regulator and was broken at this point. Installed at the end of the gas service inside the basement was a service shut off valve that had been pulled against the foundation wall.

D. Dig Safe Law Violations

1. DeFelice failed to provide proper notification to Dig Safe Systems, Inc., prior to DeFelice's excavation on Danny Road.
2. DeFelice failed to take reasonable precautions to avoid damage to NSTAR underground facilities on Danny Road.

VII. CONCLUSIONS

On November 3, 2010, as DeFelice began to excavate on Danny Road, the excavator damaged the gas service supplying 17 Danny Road. After smelling gas outside the house the excavator operator severed the gas service attempting to vent it to the atmosphere. The resulting damages to the gas service, caused the gas service valve (in the grass area between the street and sidewalk supplying 17 Danny Road) to break into two pieces, the gas service pipe inside the basement was displaced from its installation position as it was pulled towards the street and the connection to the service regulator inside of 17 Danny Road was broken.

The broken gas service valve at the street line and the broken gas pipe at the service regulator inside of 17 Danny Road, were the most likely sources of the release of gas. The escaping gas accumulated inside of 17 Danny Road, and was ignited by an undetermined source inside the house.