The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC UTILITIES

PIPELINE ENGINEERING AND SAFETY DIVISION

INCIDENT REPORT

96 The Fenway, Boston, Massachusetts
April 6, 2005

PIPELINE ENGINEERING AND SAFETY DIVISION

Accident File

Location: 96 The Fenway, Boston, Massachusetts

Date of Accident: April 6, 2005

Gas Company: KeySpan Energy Delivery, New England

Estimated Property Damage: $800,000*

Injuries: Seven

Report Issued: September 2008

* Estimated by Boston Fire Department

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I. INTRODUCTION

A. Scope of this Investigation

The Massachusetts Department of Public Utilities (the "Department"), pursuant to G.L. c. 164, §105A, has investigated a natural gas ("gas") explosion at 96 The Fenway, Boston, Massachusetts, which occurred on April 6, 2005, (the "Incident").[1] There were seven injuries as a result of the Incident. The Incident resulted in approximately $800,000 of property damage as estimated by the Boston Fire Department ("the Fire Department") (Exh. 1). The operator of the pipeline was KeySpan Energy Delivery, New England, d/b/a Boston Gas Company ("KeySpan" or "Operator").

As part of the Department's annual certification process by the United States Department of Transportation ("DOT"), the Department must report to the DOT

> [e]ach accident or incident . . . involving a fatality, personal injury requiring hospitalization, or property damage or loss more than an amount the Secretary establishes, any other accident the [Department] considers significant, and a summary of the investigation by the authority 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 DOT of 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 Department also enforces the DOT safety standards for gas pipeline systems as set forth in 49 C.F.R. § 192 et seq.

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[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 or gas from an LNG facility and
(i) A death, or personal injury necessitating in-patient hospitalization; or
(ii) Estimated property damage, including cost of gas lost, of the operator or others, of $50,000 or more.
(2) An event that results in an emergency shutdown of an LNG facility.
(3) An event that is significant, in the judgement of the operator, even though it did not meet the criteria of paragraphs (1) or (2). 49 CFR § 191.3.

The Department has reason to believe that violations of the DOT's rules pertaining to the safety of pipeline facilities and the transportation of gas, the Department's Code of Massachusetts Regulations and KeySpan's own Gas Construction Standards, Specifications and Procedures ("Procedures") occurred at 96 The Fenway, Boston. The Department concluded an enforcement action on April 25, 2008 that included actions to prevent a similar incident in the future.

B. Overview of Incident

The Fire Department Incident Report indicates that on April 6, 2005, at 1323 hours (1:23 p.m.) it received notification of a building fire at 96 The Fenway (Exh. 1). The Incident Report attributed the fire to a leak or break that caused an unintentional ignition. The Fire Department estimated property damage at $800,000.

KeySpan's report of this Incident to the DOT, stated that the cause of the incident was a release of gas. KeySpan stated that:

> Release of gas. A Company crew was activating a gas main and service at 96 Fenway, Boston, MA. A second crew had been working in the basement of the building, installing the internal piping for the service while the other crew worked on the gas main in the street.

(Exh. 2)

KeySpan reported that there were seven injuries, including one person who was hospitalized overnight. (Exh. 3)

KeySpan's concluded that a:

> Fitting crew inadvertently left valve on service relay open and went to lunch. Crew (MSF) activated main not knowing the valve was in open position.

(Exh. 4)

The Department first learned of this Incident when the Director, Pipeline Engineering and Safety Division ("Division") received a call from a Department employee about 2:05 p.m. to alert him of an incident at Northeastern University ("Northeastern"). The Director immediately contacted a KeySpan dispatcher who verified there was an explosion at Kerr Hall, a dormitory located at 96 The Fenway. The dispatcher stated "a crew was working on a service line, and someone may have turned the gas back on prematurely" (Exh. 5)

The Department's investigation finds that the explosion and resulting fire at 96 The Fenway were caused by the ignition of an accumulation of gas in the basement of the building. The origin of the gas was from a new main that had just been placed into service by a KeySpan distribution crew. Gas entered the basement through the service valve, which had been inadvertently left open, and the open end of the internal piping that a second KeySpan crew was installing from the service valve in the basement toward the meter location (Exh. 6). The Department was not able to determine the ignition source.

II. BACKGROUND

The Incident occurred at 96 The Fenway, a Northeastern dormitory. The Fenway connects Brookline Avenue and Beacon Street and is located in a mixed residential/commercial area of Boston, consisting primarily of multi-story apartments and small businesses. The Back Bay Fens, a park, is located directly west of The Fenway at this location. Hemenway Street is located east of The Fenway, separated by an alley approximately twenty feet wide between the rear of the buildings along these two streets. The gas facilities supplying 96 The Fenway, as well as numbers 90, 102 and 112-114, are located in this alley.

The basement of 96 The Fenway contained a gas fired heating boiler, two gas fired water heaters, a gas meter and incidental piping and electrical wiring. A three-inch bare steel service line[2], installed in 1926 (Exh. 7), supplied gas to the building from the main in the alley, entering the basement through the east foundation wall. It was connected to a gas meter, located in the basement. The service line was not cathodically protected.

A new three-inch plastic service with a three-inch steel service valve and a blank flange installed on the outlet side, had recently been installed into the basement.

A six-inch cast iron gas main was installed in the alley in 1913 (Exh. 8). The operating pressure[3] of the main was 8.5 inches water column[4] ("in. w.c.") (Exh. 9). The maximum allowable operating pressure[5] ("MAOP") of the main is 14 "in. w.c." (id.). A new six-inch

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[2] A service line is a distribution line that transports gas from a common source of supply to an individual customer. . . Part 192, § 192.3.

[3] The approximate operating pressure was based on KeySpan engineering models.

[4] Inches water column - a measurement of pressure with 27.71 inches of water column equal to one pound per square inch gauge.

[5] The maximum pressure at which a pipeline may be operated as set forth in Part 192, § 192.619.

plastic gas main had been installed to replace the existing cast-iron main.

III. THE DEPARTMENT'S INVESTIGATION

A. Initial Actions and Observations

On April 6, 2005, at approximately 3:35 p.m., an investigator from the Division arrived at the site to assist another Division investigator who had arrived about a half hour earlier. They met with representatives from the Fire Department, KeySpan, Feeney Brothers Excavation Corporation ("Feeney"), Northeastern, an independent contractor who worked for Northeastern and several independent inspectors and investigators.

The front area of 96 The Fenway facing the street was cordoned off by the Boston Police Department to limit access to the building. In the alley behind the building, there were numerous Fire Department vehicles. Firefighters were making sure that all of the fires were extinguished. The investigators were cautioned to not enter the building, as its structural integrity had not yet been determined.

In the meantime, they met and interviewed Tom Carlson, a self employed contractor hired by Northeastern, who stated that either he or one of his employees was usually on campus every day. Mr. Carlson and two of his employees were in the basement of 96 The Fenway shortly before the Incident occurred. The Division investigators were able to gain access to the building after meeting with two Northeastern officials.

In the basement, they observed the existing gas service, the gas meter and the downstream piping leading into the boiler room. They also observed the new gas service from the three-inch steel valve and the piping going through a concrete wall (Exh. 10). This pipe ended with an open elbow in the meter room. All of the gas valves appeared to be in the "closed" position. One of the investigators took pictures of the scene, including the gas meter, piping, valves and the open-ended service pipe (Exh. 11).

A Feeney representative briefed the investigators on the construction work in the alley. There were two excavations in the alley. The first excavation, at the north end of the alley, was the location where the new main was tied into an existing plastic main. The old cast-iron main had been disconnected from the system (Exh 12).

The second excavation, located at the south end of the alley, was where the new main terminated (Exh. 13). This was the location where air was purged out of the new main as it was placed into gas service.

The investigators also interviewed Robert Moorehead, KeySpan Construction Manager,

who was conducting KeySpan's investigation. The investigators witnessed a pressure test of the new service to 96 The Fenway from downstream of the curb valve in the alley to the service valve in the basement. The active section of the service was leak tested with soap solution from the capped end at the curb valve to the connection at the main. There was no leakage during either test.

B. Feeney Brothers

On April 5, 2005, a Feeney crew completed the installation of about 300 feet of six-inch plastic low pressure main to replace a combination of six-inch diameter and four-inch diameter cast-iron main in the alley behind 96 The Fenway. The crew also installed a new three-inch plastic service into the basement of 96 The Fenway. The service ended with a steel valve with a steel blank flange bolted onto the outlet end. The crew also installed new plastic services into numbers 90, 102 and 112-114 The Fenway. At approximately 3:00 p.m. on April 5, the crew introduced compressed air into the new main and services to conduct a pressure test of these facilities. The test was conducted at 94 p.s.i.g. for 16 hours (Exh. 9, at 20). The pressure was released by a Feeney crew member at approximately 7:00 a.m. on April 6. The test indicated there were no leaks in the pipe. According to a Feeney crew member, the service valve in the basement of 96 The Fenway was in the open position during the pressure test (id.).

C. KeySpan

After the Feeney crew had completed the pressure test of the new facilities and released the air from the main, two KeySpan crews began to work at the site. The first crew's ("street crew") job was to connect the new main in the alley to a plastic main that was already in service in the north excavation. This job was accomplished. The street crew then began work to activate the new main and service at 96 The Fenway.

At the same time, a second KeySpan crew, consisting of two fitters, was working in the basement of 96 The Fenway installing the internal piping from the outlet of the new three-inch steel service valve to the meter. One of the fitters removed the blank flange on the outlet of the service valve in the basement. The crew then proceeded to extend the new service pipe from the valve several feet through a concrete wall in the basement to the vicinity of the gas meter. "This work . . . had not been completed before the Incident" (Exh.9, at 23). In fact, the end of the pipe was left open. The crew working in the basement left the building for lunch. They advised the street crew working in the alley that it could continue to work on the gas main (Exh. 6). The street crew proceeded to purge and gas up the main. Natural gas entered the basement through the service valve, which had been "inadvertently left in the open position" and the open-ended pipe (id.). An ignition occurred which resulted in an explosion (id.). After the Incident, a KeySpan employee entered the basement and closed the service valve on the new service as well as the valve to the existing service (Exh. 14 at 3).

KeySpan's procedure PURGE-5010: Purge and Gas-in of Mains and Service Lines dated 7/01/04 states the following (Exh 14 at 4):

B. SCOPE

(1) 6. - When purging such a service line into service, the meter or riser valve shall be shut off and plugged or capped before the main is tapped out and gas enters the service line (refers to a three-inch service line less than 45 feet in length).

F. Main Purging Requirements Under Any Method

(1) 1. Isolation b. - When purging into service, all valves that could supply natural gas and shut-off devices connected to the main shall be checked to ensure that they are in the closed position and readily operable.

G. Service Line Purging Requirements Under Any Method

(1) 1. Isolation a.- All service line valves shall be checked to ensure they are in the closed position and readily operable.

On June 23, 2006, KeySpan amended Section C.3 of PURG-5010 to add the following language:

> When mains are purged separately form services, the service line valve shall be closed and meter or riser valve shall be shut off, plugged or capped before the main is purged

(Exh. 15).

D. Occupants of 96 The Fenway(Kerr Hall)

Kerr Hall, at 96 The Fenway, is a Northeastern dormitory which houses between 110 - 130 students. A luncheon was being held in a dining room on the second floor at the time of the Incident. Reportedly, moments before the explosion occurred, one of the head chefs warned the faculty and students in the dining room that he smelled gas. The building occupants evacuated the premises after the Incident. Seven persons were injured and treated at local hospitals for broken bones, cuts and burns. One person remained in a hospital overnight (Exhs. 2, 3).

E. Thomas Carlson, Independent Contractor

The two Department investigators interviewed Thomas Carlson. He stated he is a

self-employed contractor working for Northeastern. He said that either he and/or his employees are usually on the campus every day. He told the investigators that he and two of his employees were in the basement of Kerr Hall (96 The Fenway) to perform an assigned task shortly before the explosion occurred. They felt very lucky to get out of the building.

When they went into the basement, he smelled a strong odor of gas. He told his men they had to get out of there. As they were leaving they walked by the gas meter, and he smelled a strong odor of gas, saw an open pipe and heard gas escaping. He made a noise similar to the sound of escaping gas (hissing sound). They observed several KeySpan employees outside the building. One was sitting in a pickup truck eating lunch so they thought maybe this was no big deal. About a minute or two later there was a big explosion. The force of the explosion hit them in their backs, and they were all shaken up.

He said he sent his men home for the day. Later, he showed the investigators where he observed the open gas pipe in the basement (Exh. 16).

F. The Fire Department

A Department investigator interviewed three Fire Department employees who were at the site on April 6, 2005 (Exh. 17). The first firefighter's job was to search, evacuate and monitor gas levels inside the building. His gas detector went into alarm mode, and his captain ordered a second firefighter and him to verify that the gas was shutoff in the basement. Upon entering the basement the first firefighter observed the gas meter. He also observed a new, open black metal pipe coming through a wall and not connected to anything (Exh. 18).

The first firefighter requested a wrench from a second KeySpan employee standing in the alley. This employee stated that the gas was shut off. After some confusion between the two KeySpan employees, the second KeySpan employee assured the firefighters that he had personally shutoff the service to the building (id.). The second firefighter verified the report given by the first firefighter (Exh. 19).

The third firefighter, a lieutenant, arrived with Engine 33 and proceeded to the rear of 96 The Fenway. He observed three KeySpan employees standing near their trucks in a dazed, confused and stunned appearance. They stated they were eating lunch in the truck when the explosion occurred. As they were speaking, a firefighter from Rescue 2 (firefighter #1) appeared at the door and asked for a wrench to turn off the gas. One of the KeySpan workers was adamant in his opinion and insisted that the gas had already been turned off and there was no gas in the building (Exh. 20).

G. Other Tests and Observations

Nine KeySpan employees and four Feeney employees, who were working on the main

and service at 96 The Fenway on April 6, 2005, were subjected to drug and alcohol tests after the Incident. Results of these tests were negative (Exh. 9 at 16). These employees are part of KeySpan's random drug testing pool. KeySpan did not drug test the employees who conducted leak surveys at 96 The Fenway and surrounding buildings after the Incident occurred.

49 C.F.R. § 199.11, Drug tests required, states in relevant part:

> (b) Post-accident testing. As soon as possible but no later than 32 hours after an accident, an operator shall drug test each employee whose performance either contributed to the accident or cannot be completely discounted as a contributing factor to the accident, and

49 C.F.R. § 199.225 Alcohol tests required, states in relevant part:

> (a) Post-accident. (1) As soon as practicable following an accident, each operator shall test each surviving covered employee for alcohol if that employee's performance of a covered function either contributed to the accident or cannot be completely discounted as a contributing factor to the accident.

Since there were no gas readings at any other locations, there was no reason to suspect that the main or service contributed to this Incident. KeySpan completely discounted the performance of the leak surveyors as a contributing factor to the Incident. This eliminated the leak surveyors from post-accident drug and alcohol testing.

IV. LEAKAGE SURVEYS AND MAINTENANCE ACTIVITIES

A. Leakage Surveys

Leakage surveys of gas mains and services are required by federal and state regulations, Part 192, § 192.723[6] and 220 C.M.R. § 101.07.[7] An operator generally employs

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[6] Leakage survey with leak detection equipment must be conducted outside business districts at intervals not exceeding five years. However, for cathodically unprotected distribution lines subject to Part 192, § 192.465(e) on which electrical surveys for corrosion are impractical, survey interval may not exceed three years.

[7] Operators shall conduct leakage surveys over all service lines as frequently as experience and technology indicate are necessary, and in accordance with Part 192.

flame ionization detectors[8] and combustible gas indicators to locate and quantify gas leakage. KeySpan conducted a walking survey the week of September 5, 2003 (Exh.14, at 5). A cast-iron winter patrol survey was performed on the main behind 96 The Fenway on March 11, 2005 (Exh. 9, at 12). KeySpan has no record of any leaks on this main or service line to 96 The Fenway over the past year (Exh. 9, at 5 and 6). KeySpan leak surveyed the following buildings after the Incident occurred: 90, 96, 102, 110, 114 Fenway and 129, 149, 153, 157, 163, 165, 171 and 175 Hemenway Street. No gas readings were obtained (Exh 9, at 8).

B. Maintenance and Replacement Activity

Other than the main replacement work that was ongoing at the time of the Incident, KeySpan had no record of any maintenance or replacement work performed on this main over the past year (Exh. 9, at 5). KeySpan has not located any record of prior entry into 96 The Fenway (Exh. 9, at 7).

KeySpan has no record of any prior leak survey of its interior piping nor any record of leak history or maintenance performed on customer owned piping or appliances (Exh 14, at 5). KeySpan provided no records of having inspected the interior service pipe that is exposed to the atmosphere for evidence of atmospheric corrosion (id.). The last meter change prior to the Incident was September 14, 1990 (id.).

V. TRAINING AND OPERATOR QUALIFICATION

KeySpan provided training records of the four employees in the crew that placed the new main into gas service on April 6, 2005 (Exh. 21). One of the crew members attended Basic Training in the Spring of 1996. The crew members attended a PCS (Provide Construction Service) Refresher Training class in April, 2000. All four attended Spring and Fall Training classes on a regular basis from May, 1999, through December, 2004 with the following exceptions. A review of the records indicated that two employees did not attend the Spring, 2001 class. Additionally, none of these employees attended a Fall Training class in 2003. One of the employees did not attend a Fall Training class in 2004. KeySpan has indicated that the Spring and Fall refresher training outlines for the period from 1999 to the date of the Incident do not specifically cover the topic of ensuring that all service valves are in the off position prior to activating mains (Exh. 21, at 1).

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[8] Flame Ionization Detector - An instrument that uses hydrogen fuel to power a small flame in a detector cell. A pump is used to pass continuous air samples through the cell. If a sample contains hydrocarbons such as gas, it will be burned or ionized in the hydrogen flame. It is accurate in the parts per million range.

KeySpan also provided training records of the two employees in the fitting crew who were working to extend the service in 96 The Fenway (Exh. 22). One employee attended PFR (Process Field Requests) Refresher Training in December, 2000. Both employees attended Spring and Fall Training in 2002.

Part 192, **Subpart N: Qualification of Pipeline Personnel** requires operators to have a qualification program for its employees who perform covered tasks on its pipeline system. Among other criteria, a covered task is an activity that is performed as an operations or maintenance task. KeySpan provided the operator qualification records for the employees involved in the work at 96 The Fenway (Exh. 23). All of the employees were originally certified by October 28, 2002. Street personnel were certified in forty five tasks. Each of the four crew members was certified in "Purging air from the new pipeline" (Task ID NGA-032). The street crew members were certified in Task ID NGA-048, "Extend or cut back on an existing service line". They were also re-certified in Task ID NGA-070, "Abnormal Operating Conditions/Properties of Natural Gas", in May or July, 2004. The two members of the fitting crew were certified in seventeen tasks. They were certified in Task ID NGA -041, "Inspect valves" and Task ID NGA-70 "Abnormal Operating Conditions/Properties of Natural Gas". According to KeySpan, Task ID NGA-048, Extend or cut back on an existing service line, is considered a distribution function. The fitters were not certified in this task.

VI. ODORIZATION

In accordance with 220 C.M.R. § 101.06(20), an operator must odorize the gas in its distribution system of sufficient intensity so that the gas is readily perceptible to the normal or average olfactory senses of a person coming from fresh, uncontaminated air into a closed room containing 0.15 percent gas in air. An operator must also conduct periodic sampling of the gas to assure the proper concentration of odorant throughout its system.

Tests were conducted by three different employees after the explosion at the following Boston locations:

1. 165B Hemenway St., 4/6/05 @ 2:45 p.m. - Odor level @ 0.06-0.09% gas in air
2. 103 Hemenway (Apt. 15), 4/6/05 @ 3:30 p.m. - Odor level @ 0.065- 0.01% gas in air

The odor detectibility levels of gas in air after the Incident ranged from 0.06 to 0.01 percent gas in air, indicating that the odorant levels were within the prescribed state regulations (Exh. 9 at 14, Att. 6).

VII. FINDINGS AND CONCLUSIONS

A. Findings

1. A six-inch low pressure cast iron gas main was installed in the alley behind 96 The Fenway in 1913.
2. A three-inch bare steel service was installed to 96 The Fenway in 1926.
3. A Feeney crew installed a new six-inch low pressure plastic gas main in the alley behind 96 The Fenway to replace the existing cast-iron main.
4. The same Feeney crew installed a three-inch low pressure plastic gas service into the basement of 96 The Fenway to replace the existing gas service in the building.
5. The Feeney crew also installed plastic gas services into 90, 102 and 112-114 The Fenway.
6. Feeney installed blank flanges on the outlet ends of the four service valves to the new gas services.
7. The four valves were left in the open position for the pressure test of the new main and services.
8. KeySpan's Procedure, MAIN-5180: Pressure Testing Distribution Mains, Date 7/01/04, Section D. Test Pressures 1. states: "New service lines shall be tested up to the shut-off valve on the riser, or the inside shut-off valve". The procedure does not specifically state if the valve should be open or closed.
9. On April 5-6, 2005, Feeney conducted a successful pressure test of the new facilities at 94 p.s.i.g. for 16 hours to verify there were no leaks.
10. The test pressure was released at approximately 7:00 a.m. on April 6, 2005.
11. After the pressure test had been completed, a KeySpan crew worked in the alley to connect the new gas main and services to an existing plastic main and to abandon the cast-iron main.
12. After the new facilities were connected, the crew began work to activate the new main by purging it into service; (i.e. -admitting gas into the main).
13. The Incident Report stated that the fitting crew inadvertently left the valve on the service relay open and went to lunch. The (MSF - Maintain System Facilities) crew activated the main not knowing the valve was in the open position and that the blind flange had been removed.
14. KeySpan's Procedure CNST-5010: General Construction Requirements, dated 7/01/04, Procedure A. General 2. Training states: "Company personnel must be trained and qualified to perform the work covered in this document."
15. KeySpan's Procedure PURG-5010: Purge and Gas-in of Mains and Service Lines, dated 07/01/04, Section B. Scope 6., referring to a three-inch service less than 45 feet in length states: "When purging such a service line into service, the meter or riser valve shall be shut off and plugged or capped before the main is tapped out and gas enters the service line."

16. KeySpan's Procedure PURG-5010: Purge and Gas-in of Mains and Service Lines, dated 07/01/04 Section F.1. Isolation b. states: When purging into service, all valves that could supply natural gas and shut-off devices connected to the main shall be checked to ensure that they are in the closed position and readily operable.
17. KeySpan's Procedure PURG-5010: Purge and Gas-in of Mains and Service Lines, dated 07/01/04 Section G. Service Line Purging Requirements Under Any Method Number 1. Isolation a.. states: "All service line valves shall be checked to ensure they are in the closed position and readily operable."
18. A second KeySpan crew, consisting of two fitters, worked in the basement of 96 The Fenway to extend new service pipe from the outlet of the service valve to the gas meter.
19. One of the fitters removed the blank flange from the service valve. They failed to close the service valve.
20. The fitters extended the service pipe from the service valve through a concrete wall into the meter room and installed an open-ended elbow in the service.
21. The crew working in the basement left the building for lunch before finishing the service line work. They advised the street crew working in the alley it could continue to work on the gas main.
22. The street crew proceeded to activate the main, and natural gas entered the basement of 96 The Fenway through the open service valve and the open-ended pipe. An ignition occurred which resulted in an explosion and fire.
23. A KeySpan employee entered the basement after the explosion and turned off the service valve.
24. On April 6, 2005, at 1:23 p.m., the Fire Department received notification of a fire at 96 The Fenway
25. The source of the gas leak was through the service valve, which had been inadvertently left in the open position and the open-ended pipe in the service.
26. The accumulation of gas in the basement of 96 The Fenway was the fuel for the Incident.
27. One of the head chefs warned persons in the dining room on the second floor he smelled gas moments before the explosion.
28. Emergency response personnel detected a strong odor of gas upon entering the building.
29. The Fire Department estimated that the Incident caused $800,000 in property damage.
30. There were seven injuries as a result of the Incident.
31. KeySpan had conducted leakage surveys of the area during the year preceding the Incident and found no leaks in its system.
32. The gas odorant levels in KeySpan's distribution system at 96 The Fenway met regulatory requirements.
33. KeySpan has a dedicated program to train its employees and to ensure that its

employees are certified to perform covered tasks through its Operator Qualification program.

34. KeySpan certifies its distribution personnel, but not its fitting personnel, to extend or cut back on an existing service line in accordance with covered task NGA-048.
35. KeySpan indicated that it does not have any records of prior leak surveys of the interior service piping in 96 The Fenway.
36. KeySpan indicated that it does not have any records of prior inspections of the service pipe in 96 The Fenway that is exposed to the atmosphere for evidence of atmospheric corrosion.

B. Conclusions

KeySpan has methods in its Procedures to address the purge and gas-in to service of new mains and service lines. However, two crews working independently and concurrently at 96 The Fenway failed to adequately follow these procedures. The street crew, working to activate the new main, failed to ensure that all shut off devices connected to the main were in the closed position. This is required by KeySpan's procedures.

The fitting crew, working in the basement to connect the new service to the meter, did not close the service valve after it removed the blank flange at the valve outlet. When they went to lunch and notified the street crew that work could continue on the main, they had left the service valve in the basement open. This permitted gas to enter the basement of 96 The Fenway through the open-ended pipe when the main was purged into service. Something in the basement ignited the leaking gas and caused the subsequent explosion and fire. The Department has reason to believe that KeySpan failed to apply its own procedures to address the purge and gas-in to service of the new main and service at 96 The Fenway, and that failure was the primary cause of the Incident.

KeySpan has a dedicated program to train its employees and to ensure that its employees are certified to perform covered tasks through its Operator Qualification program. However, it appears that training may be deficient related to the position of and operation of valves prior to and during purging operations as well as extending service lines. Keyspan's training program for the fitting crews failed to adequately address the need and importance of verifying that valves connected to the system to be purged are shut off.

VIII. KEYSPAN ACTIONS

On April 25, 2008, pursuant to G.L. c. 164, § 105A and 220 C.M.R. §§ 69.00 et seq., the Department concluded an enforcement action with KeySpan. KeySpan Energy Delivery, New England, D.T.E./D.P.U. 05-PL-19. KeySpan agreed to review and revise its purging

procedures to include requirements to check all valves to prevent gas from flowing out of the segment to be purged. KeySpan also agreed to review and revise its procedures to ensure that its training and procedures for pipe fitters and service personnel include requirements for capping and purging all gas piping before leaving a work site.