

STATE OF NEW YORK  
DEPARTMENT OF PUBLIC SERVICE



147-25 Sanford Avenue, Queens  
Natural Gas Explosion  
July 25, 2008  
Consolidated Edison Company of New York. Inc.

Safety Section  
Office of Electric, Gas & Water  
April 2009

## Summary

On Friday, July 25, 2008, at approximately 4:15 PM, a natural gas explosion occurred within an apartment building located at 147-25 Sanford Avenue, Flushing (Queens), in the territory of Consolidated Edison Company of New York, Inc. (Con Edison). The explosion was centered in apartment 2P. Con Edison Gas Distribution Service (GDS) mechanics had been on location that day to restore gas service to seven of the building's risers.<sup>1</sup> Natural gas entered apartment 2P through an appliance valve that had been left open. The gas ignited, causing serious injury to two occupants of the apartment and damage to that unit and surrounding apartments. One of the occupants subsequently died on October 9, 2008.



Photo 1 - 147-25 Sanford Avenue

---

<sup>1</sup> customer-owned piping within the structure serving individual apartments downstream of the meter.

On June 11, 2008, a fire in apartment 5G led to the New York City Fire Department (FDNY) turning off gas service to the building, and to Con Edison issuing a warning tag<sup>2</sup>. Repairs were made to the piping within the building by a licensed plumber over the next several weeks.

Con Edison procedures<sup>3</sup> require that certain tasks be performed to ensure the readiness and safety of house piping prior to restoring gas service to an apartment building. On July 25, 2008 Con Edison GDS mechanics completed testing and gas service to several risers within the building was restored. Shortly after the mechanics left, the explosion occurred. While Staff believes that no person working for Con Edison was inside apartment 2P working on the appliance valve, Staff's investigation found that the GDS mechanics did not perform their work in accordance with company procedures.

#### System Description

A 1991 vintage 8-inch low pressure plastic gas main, operating at 7.7 inches of water column<sup>4</sup>, runs east-west on Sanford Avenue between 147th and 149th Streets, three feet north of the south curb line. The plastic service line supplying 147-25 Sanford Avenue was installed in 2007, and enters the building at the east-facing ground floor wall of the meter room. The multifamily structure had one master meter with 14 separate ¾-

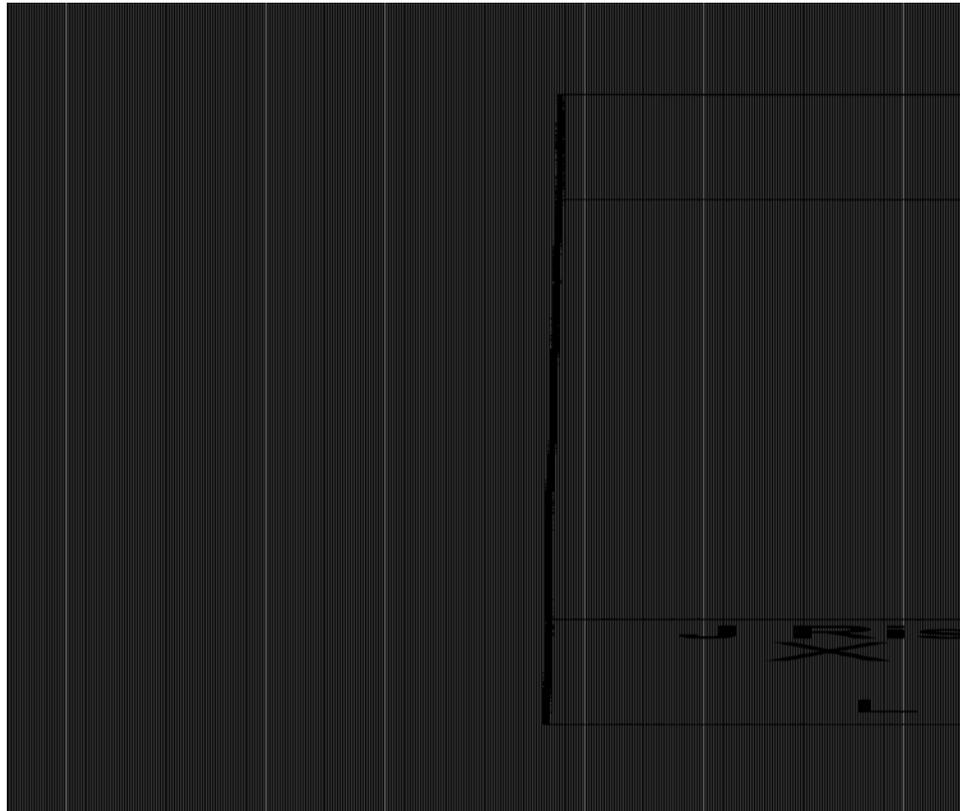
---

<sup>2</sup> Warning tags are issued by utility operators to alert customers of unsafe conditions on their piping or appliances. The customer is responsible for repairs. The Commission's regulations pertaining to warning tags are contained in 16 NYCRR Part 261.

<sup>3</sup> Con Edison Procedure: G-11836 "Meter Turn-on and Turn-off for: Meter Changes, New Meter Sets and when Restoring Gas Service Inside Buildings After the Meter/Service Has Been Turned Off"

<sup>4</sup> Low pressure is typically expressed in units of inches of water column ( " w.c.): 1 pound per square inch (psi) = 2.7" w.c.

inch steel risers providing gas service to all apartments. The risers were identified through letter coding, i.e. "M" riser supplied apartments 1M, 2M, 3M, etc. The master meter also fed an additional lobby-level riser and a trunk line to the gas boilers. The arrangement of the building and the location of the riser valves ( **X** ) are shown below. The **Legend** indicates the post incident as-found condition.



### Background

Within Con Edison, building gas turn-on functions are typically coordinated with the Energy Services Department (ESD). ESD maintains contact with building superintendents and plumbers, and when the building has met the requirements for gas turn on, ESD contacts Gas Operations to dispatch a GDS mechanic to perform the turn-on.

Con Edison procedure G-11836 requires that a plumber requesting restoration of gas service in which a plumber has

corrected a warning tag condition to provide a Blue Card (if applicable)<sup>5</sup> and an Integrity Test Affidavit.<sup>6</sup>

Procedure G-11836 requires that an integrity test be performed on a gas riser prior to restoring gas service. The first step is to verify that the piping to be tested is gas tight by turning off appliances and appliance valves. Con Edison's procedure requires that isolation be verified by checking 10 percent of the units on the riser, which in the case of 147-25 Sanford Avenue meant confirming a closed appliance valve in one apartment per riser.

To perform the test according to procedure, a manometer (or U-gauge)<sup>7</sup>, is installed. Air pressure is introduced to the piping, and is held for an amount of time, typically 5 to 15 minutes, as the mechanic monitors the pressure on the manometer. If pressure drops, in any increment or for any reason, the integrity test has failed and gas will not be introduced to the riser. If the pressure holds, the continuity of the line is verified by relieving the pressure (referred to as a *bleed*) at the furthest accessible point from where the test was conducted

---

<sup>5</sup> Blue Card is a NYC Buildings Department record demonstrating that new plumbing and gas piping systems and every part of an existing system that has been altered or repaired (except for minor alterations and ordinary repairs) was tested to disclose leaks and defects (for system less than a ½ psig, a 3 psig test for a minimum of thirty minutes is required). It is required whenever a plumber replaces more than two feet of gas piping.

<sup>6</sup> Integrity Test Affidavit is a Con Edison document signed by the contract plumber certifying that all gas piping is complete and continuous up to appliances in the affected apartments. It also certifies that gas utilization equipment, and gas appliances have been inspected and that the fuel line or appliance valves have been closed.

<sup>7</sup> An instrument used to measure the pressure exerted by liquids and gases. Pressure is exerted on one end of a U-shaped tube partially filled with liquid; the liquid is displaced upwards on the other side of the tube by a distance proportional to the pressure difference on each side of the tube.

by either turning on a gas appliance or opening an open-ended appliance valve. For example, if the integrity test pressure was monitored in the basement, ideally the pressure would be bled down from the top floor apartment. The drop in pressure would be seen immediately on the manometer, and it verifies that the entire length of pipe between the two test points was included in the pressure test.

After performing the integrity and continuity tests, gas would then be introduced into the line, and the line cleared of air by the process of "gassing-in"<sup>8</sup> an appliance. Appliances would then be re-lit (for example, the pilots on a stove would be lit). Con Edison's procedure requires it to gas-in at least one appliance at the furthest point (from the meter) on the riser(s). Upon request, Con Edison personnel will assist in turning-on and gassing-in customer owned laterals and equipment. The procedure requires a "Gas Turn-on Affidavit"<sup>9</sup> be obtained if the remainder of a turn on is being performed by other than its own personnel.

#### Timeline: Pre-incident

The description of events that follows was developed over a series of interviews with involved parties (Con Ed mechanics, plumbers, building tenants) and a review of time stamped records.

---

<sup>8</sup> Gassing-in/purging is a process by which air is purged from the line by the introduction of natural gas. The gassing-in is routinely performed through an appliance i.e. lighting of a range top burner.

<sup>9</sup> Gas Turn-on Affidavit is a Con Edison document signed and by the contract plumber attesting that a leakage test was performed and documenting any conditions that have been repaired.

On June 11, 2008, Con Edison was contacted by FDNY, which reported shutting a valve at a gas range in apartment 5G due to a fire at the range. When a GDS mechanic arrived at the scene, the head of service valve<sup>10</sup> was found turned off. In accordance with Con Edison's procedure, the mechanic installed a lock at the valve, turned off and locked the meter and issued a class "A" warning tag. The property owner is responsible for repairs to piping and/or appliances inside the building. The turn off of the building's gas service impacted the boiler pilots, hot water, heat, laundry service and cooking gas supply for 89 apartments.

On July 1, 2008, ESD contacted Gas Operations and requested turn-on of a riser located entirely on the ground floor. Approximately 80 feet of new piping had been installed from the meter to the boiler pilots following the June 11, 2008 fire in order to restore hot water service (and heat, if required) to the building while other repair work was in progress. A GDS mechanic was dispatched and restored gas service to the meter, and then to the riser. Gassing in of the boiler was left to the plumber. The mechanic also isolated the rest of the building risers.

On July 23, 2008, ESD was contacted by the building plumber requesting the turn-on of riser "B". ESD communicated the need for a signed affidavit, and faxed blank copies to the plumber. A supervisor from ESD was on site for an inspection conducted by the NYC Department of Buildings<sup>11</sup>, including the required plumber's pressure test. The GDS mechanics arrived and a satisfactory integrity test was performed in the presence of the

---

<sup>10</sup> The head of service valve is the first valve in the building, just inside the building wall and upstream of the gas meter.

<sup>11</sup> NYC Department of Buildings presence was confirmed by viewing the Department's work order website.

Con Edison supervisor. Riser B was then gassed in, and the building plumbing contractor agreed to gas in the six ranges on that riser, i.e. Con Edison did not gas in at least one appliance as required by procedure G-11836.

Later that evening, a tenant in apartment 2C contacted Con Edison to report a gas odor. Con Edison responded but their investigation found no indications of a gas leak.

On July 24, 2008 ESD received an affidavit from the plumber requesting a turn on of risers A, F, N, T and laundry room (Attachment A).

On July 25 a turn-on ticket was issued for those risers, and a GDS mechanic was dispatched. At around 12:25 PM on July 25 the mechanic arrived at the location to begin the turn-on process, and shortly after a supervisor arrived to assist. The building's lead plumber showed the mechanic and supervisor the locations of the A, F, N, and laundry room riser valves, all located on the lobby level. The GDS mechanic and supervisor were informed by the plumber that there was no "T" riser as listed on the turn-on affidavit. In accordance with company procedure G-11836, the supervisor verified, in one apartment on each riser, that an appliance valve (appliance control cock or ACC) was installed. All of the apartments the Con Edison mechanics and supervisor were taken to were selected by plumbers, and access was provided by the building superintendent or the plumbers. The Con Edison supervisor claimed that he was taken to accessible apartments on the A, F, and N risers by the plumber, but he did not specifically recall which ones. He recalled one of the apartments being on the lobby level, and the other two were on the fifth floor. In the laundry room the riser was largely visible, and the presence of the ACC was confirmed.

After confirming the presence of ACCs, the mechanic proceeded to perform integrity tests on the A, F, N, and laundry room risers. Riser F was tested first, with the manometer set up by the mechanic in apartment L5 on the lobby floor. After holding the pressure on the F riser, the supervisor and plumber proceeded to the fifth floor to bleed the riser. The supervisor remained outside the apartment while the plumber entered to perform the bleed. The mechanic witnessed the drop in pressure on the manometer indicating that the bleed was performed, and then disconnected the manometer assembly.

The mechanic then met the supervisor on the fifth floor, entering apartment 5N to set up for the next integrity test. The testing process was repeated, except this time with the manometer placed on an upper floor and the bleed on a lower floor. Following the hold period, the supervisor was led by the plumber to another floor (no record as to which) to conduct the bleed. Once again, the supervisor remained outside while the plumber entered and performed the bleed. The mechanic in apartment 5N confirmed a drop in pressure and a short time later the supervisor and plumber returned.

At approximately 2:15 PM, as the mechanic was disconnecting the equipment in apartment 5N, a Con Edison planner arrived along with a second GDS mechanic. While the planner was briefed by the supervisor, the two mechanics set up for an integrity test of the A riser in apartment 5A, again initiating with the manometer on the upper floor. Shortly thereafter, the planner and the supervisor were approached by the plumber who requested the turn-on of three additional risers: G, M, and P. The planner granted the request without first confirming with ESD that the required affidavits had been submitted, or at least

asking the plumber for copies of the submitted affidavits.<sup>12</sup> The planner accepted the plumber's verbal representation that these additional risers met all the conditions of the affidavit and were ready to be energized. The planner then left the location, and the supervisor went outside to his vehicle to complete paperwork and plan for the day's shift change.

The mechanics proceeded to pressure test riser A. The manometer was set in place at the ACC outlet and air was introduced and pressure was monitored. Following the hold time, the mechanics stated that the plumber proceeded unaccompanied to another floor to bleed the riser. The mechanics witnessed the pressure drop on the manometer, and then proceeded to disconnect the test equipment.

The laundry room integrity test was performed next, commencing at the lobby level. Staff believes that following this test all four riser valves were unlocked and opened and gas was introduced to all four risers tested (laundry room, F, A, N). The Con Edison mechanics gassed in an appliance (a dryer) immediately after the turn-on of the laundry room riser. Based on post-incident interviews Staff concluded that no representative from Con Edison gassed-in any appliances on the other three risers as required by company procedure G-11836. That task was left to the building plumber.

The two Con Edison mechanics remained in the building to perform integrity tests and gas-in of risers G, M, and P. It was not Con Edison's practice to keep records detailing which specific apartments were entered, but interviews conducted post-incident lead staff to believe that the pressure tests for risers G and M were conducted within lobby apartment L3 and

---

<sup>12</sup> Staff's post-incident review of Con Edison records found that the plumber had filed an affidavit for these risers (see Attachment B)

apartment 3M respectively. Staff also believes that while the two mechanics conducted sound pressure tests on the G and M risers, neither mechanic performed or witnessed the bleeds. The GDS mechanics stated in interviews that this step was performed by the building superintendent or plumber while the mechanics watched the manometer for the pressure drop. Based on the interviews, and all available information, staff cannot determine from which apartment the bleeds of the G and M risers were performed. In addition, post-incident interviews with the GDS mechanics revealed that in apartment L3 (G riser) a pipe nipple and cap were present instead of an appliance valve as indicated on the Gas Turn-On Affidavit.

At approximately 2:55 PM the mechanics moved on to perform the final integrity test, on riser P. Staff is certain, based on interviews with Con Edison personnel and the apartment tenant, that this test was set up in 6P. When the mechanics entered the apartment, they found the range disconnected and no appliance valve installed. Because of the piping configuration in this unit, the appliance valve was to be installed inside a base cabinet. The mechanics saw the ACC valve assembly on the counter top, and the open end of the riser piping was secured with a pipe nipple and cap. Although it did not conform to procedures, the mechanics agreed to conduct the integrity test, prior to the valve being installed, by removing the cap and securing the manometer to the open end of the riser. Air was introduced to the riser, and following the hold period the riser was bled. Based on the interviews, the Con Edison employees did not bleed (or witness the bleed of) the P riser, but instead yelled out to someone standing by the apartment door (not sure who) to proceed with the bleed. The mechanics stated that they witnessed the pressure drop on the manometer and then disconnected the equipment. The open end of the riser was left

uncapped, with the understanding that the plumber or plumber's assistant would install the appliance valve when the Con Edison mechanics left the unit. Photographs taken immediately following the incident indicates that the open end of the riser in apartment 6P had been restored to its pre-integrity test condition, i.e. nipple and cap (See Photo 2). During a subsequent interview, the plumber's assistant attested to replacing the nipple and cap.



Photo 2 - Nipple and cap in Apt. 6P

At approximately 3:20 PM the mechanics returned to the lobby level to open the riser valves, introducing gas into risers P, M, and G (in that order). Staff believes that some or all of the valves may have been opened by the plumber, but in the presence of the Con Edison mechanics. The turning-on of the risers took approximately 15-20 minutes due to the difficulty encountered in accessing and opening the P riser valve. Access to that valve was through a 12-foot high ceiling panel located in the boiler room. The plumber had to use a ladder and also had to break the bullet lock in order to open the riser valve. The Con Edison mechanics and the plumbers admit to not gassing in any appliances on risers P, M, and G. The mechanics gathered

their equipment and prepared to leave the building. They saw the plumbers leave at approximately 4:05 PM, and they left at around 4:15 PM.

Con Edison received notification of the explosion at 4:20 PM.

#### Post incident investigation

Staff received notification of the explosion at approximately 5:15 PM. Staff was dispatched to the location and arrived at approximately 8:40 PM. Upon arrival, Staff found that the scene was being controlled by FDNY marshals and the company had not been allowed entry. Staff was made aware that Con Edison personnel had been on location that day performing gas turn-ons. Later in the evening, the FDNY granted Staff and Con Edison personnel access to apartment 2P, where the explosion was centered. The area was photographed. The stove was found pulled away from the wall and leaning on the opposite counter (done so by the FDNY prior to Staff's arrival). An appliance valve was found installed and in the open position with no plug at the opening. The stove and associated flex connector was not secured to the end of the gas riser. Based on the condition of the flex hose and valve connection, the stove appeared to have been disconnected prior to the incident (See Photo 3 below).



Photo 3  
Appliance valve in Apt 2P

Staff returned to the scene the following day, Saturday July 26. Neither staff nor the company was allowed in the building while the Fire Marshals were conducting their investigation. However, the marshals kept staff abreast of their investigation, and stated that the riser involved (P) would be pressure tested the next day.

On Sunday July 27<sup>th</sup>, staff was present while riser P was pressure tested twice. During the first test the manometer was set-up in apartment 6P, pressurized, and the line was bled from apartment 4P. In the second test the manometer was once again placed in 6P, but this time the line was bled from apartment 2P. In both cases the pressure held for approximately 10 minutes at 10 inches water column and the bleed was witnessed by staff indicating that the line was sound and continuous between both points.

Also on this date, Staff conducted interviews with the building plumbers (lead plumber and assistant), building superintendent, and Con Edison personnel. Con Edison photographers were granted access to additional apartments within the building, to take photographs of the as-found condition of stove connections in the building.

In the days that followed staff participated in several interviews involving Con Edison personnel present the day of the incident and tenants of the building. Staff was also provided details of interviews conducted by other parties (Con Edison's legal department and the Fire Marshal).

#### Review of Applicable Records

As part of its investigation, Staff reviewed Con Edison's records for compliance with its own procedures and with the sections of 16 NYCRR Parts 255 and 261 that might have had a bearing on this incident. Included were records relating to:

- Warning tags
- NYC blue Cards
- Gas turn-on and integrity test and affidavits
- Work orders
- Qualifications of Con Edison's personnel
- Odorization of gas

The details of these reviews are included in Attachment D. Staff notes that Con Edison's gas turn-on work order documentation did not include the locations within the building where integrity test and gassing-in activities were performed. Therefore, aside from post-incident interviews, Staff had no way of confirming which apartments the company personnel had entered.

### Bleed and Gassing-in of the P Riser

In post-incident interviews, the plumbers and superintendent denied participating in the integrity test, bleed, or gassing-in of the P riser.

The tenant of apartment 6P stated in an interview<sup>13</sup> that the superintendent and two men came to the apartment at approximately 2:20 PM on the date of the incident, went into the kitchen, then said they would be back and left the apartment. Shortly before 3:00 PM the superintendent and three or four other men returned. The tenant had to leave for an appointment in Manhattan and told the superintendent to make sure to lock up. The superintendent had a key to the apartment.

The tenant of apartment 1P stated in an interview that at around 2:30 PM the superintendent came to the apartment with another person, believed to be the plumber's helper, and said they were there to check the gas. The superintendent left, but the other person worked in the kitchen for about 15 minutes and then also left. The tenant observed that a red metal object<sup>14</sup> was now attached to the gas line. About 30 minutes after the plumber's helper left, he and the superintendent returned, went into the kitchen for a short time, and then left together.

Other tenant interviews revealed that occupants were home in 3P and 4P, but no one requested access the day of the incident. The occupant of 5P was not at home at all that day. The residents of 2P were not home during the integrity test but the superintendent claims to having seen the male occupant and infant daughter in the lobby at approximately 3:30 PM. The superintendent also claimed to not have a key to apartment 2P.

---

<sup>13</sup> Staff did not directly participate in the interview of the 6P tenant. The interview was conducted by Con Edison, which provided its notes to Staff.

<sup>14</sup> This would be the ACC valve.

The Con Edison mechanics admit to not gassing-in any appliance on the P riser. Regarding the bleed, they claim they yelled out to someone (not sure who) standing by the apartment door (of 6P, where the test was initiated) to proceed with the bleed, and observed the pressure drop on the manometer.

Because the Con Edison mechanics did not perform, witness, or document the bleed on the P riser, the possibility of it occurring in apartment 2P cannot be completely ruled out. Under this scenario it could be postulated that the plumber or superintendent performed the bleed by opening the appliance valve and forgot to close it, which would then allow gas to flow into the apartment once the riser valve was opened. As stated previously, the plumbers and superintendent deny any participation in the integrity test, bleed, or gassing-in of the P riser. However, this is contradicted by the interviews with the tenants of apartments 1P and 6P. Furthermore, the superintendent and plumbers controlled access to all apartments.

Based on the interview provided by the tenant of apartment 1P, it is more likely that the bleed of the P riser transpired in apartment 1P. Aside from apartment 2P as discussed above, apartments 3P through 6P are accounted for. The lobby level of the P riser is the boiler room and contains no purge point where the bleed could be performed. Furthermore, the statement of the 1P tenant that the superintendent and plumber's helper had been in and out twice is consistent with the timing of when the test of riser P was conducted. In addition, performing the bleed in 1P is consistent with doing so as far as possible from the manometer set-up (in 6P).

#### Discussion

Piping integrity tests are performed to assure that the piping between the two test points, the manometer and bleed

location, is continuous and unobstructed. Gassing-in an appliance at the furthest point on a riser assures that the riser piping has been purged of air so that appliances will stay lit.

On July 25, 2008 the integrity tests of the risers were performed in two sets; A, F, N, and the laundry room; followed by G, M, and P. Set-up of the manometer for each riser was executed by one or both GDS mechanics. However, the bleed of the piping at an apartment along the riser was conducted by the plumber and not by a Con Edison employee. The Con Edison supervisor accompanied the plumber to apartments to bleed risers A, F, and N, but never actually entered any apartment. No one from Con Edison participated in any aspect of the bleed on the G, M, and P risers. The procedure does not specifically state that a Con Edison employee must perform the bleed, but Con Edison procedures are written for its own employees. In addition, since Con Edison did not document the apartments where the bleeds occurred, the length of pipe continuity could not be confirmed.

Based on interviews conducted with the Con Edison mechanics, no appliance valve was found secured to the end of the riser pipe within the lobby apartment on the G riser (section 11.4(c) of Procedure G-11836). Instead a pipe nipple and a cap were in place. Staff also observed these conditions which contradicted the affidavits previously provided by the plumber.<sup>15</sup> In apartment 6P they encountered the same conditions. In both cases the mechanics should have questioned the existence

---

<sup>15</sup> Both Gas Turn-On Affidavits (risers A, F, N, T, Laundry Room; M, P, G) contain the notation "Also replaced gas cocks and flexes for these risers."

and validity of any plumbers affidavits rather than proceed with the integrity test (section 11.4(b) of Procedure G-11836).<sup>16</sup>

Pictures taken of the interior of various apartments after the incident indicated other instances of missing appliance valves. However, since the GDS mechanics only entered those apartments necessary to conduct the integrity tests, they had no knowledge of these other missing appliance valves (Section 11.4(c) of Procedure G-11836).

After the integrity test of the first set of risers (A, F, N, laundry room) the individual riser valves were opened and gas was introduced. The same procedure was followed for the second set of risers (G, M, P). The integrity test of each riser averaged approximately 15-20 minutes. Therefore, the turning-on of the riser valves would have occurred approximately 45 minutes to an hour after the start of the integrity test of each set of risers. While not specified in the procedure, Staff believes that the practice should have been to test a single riser and then, before testing the next riser, perform the turn-on and gassing-in. This would reduce the likelihood that the as-tested condition of the piping could be altered, such as by inadvertently leaving a valve open somewhere, prior to the introduction of gas.

Finally, Con Edison left the gassing in of appliances entirely up to the plumbers, rather than themselves gassing in at least one appliance at the furthest point on the riser (Section 11.5 of Procedure G-11836).

The appliance valve in apartment 2P was found open following the incident. However, it would have had to be closed

---

<sup>16</sup> The Con Edison planner had earlier agreed to turn on risers G, M and P without first verifying the required affidavits had been submitted, even though later on it was found that they had been.

during the integrity test of riser P, or the test would not have passed. This indicates that someone entered apartment 2P sometime after completion of the integrity test but before the gassing-in of the riser (which took 15 - 20 minutes due to difficulty accessing the riser valve in the boiler room) and opened the appliance valve. This most likely was one of the plumbers or the building superintendent. If the P riser had been gassed in at the time they opened the appliance valve, they would have smelled and/or heard the escaping gas logically leading to reclosure. However, if the appliance valve was opened before gas was introduced to the riser, and inadvertently left that way, then when gas was introduced it would flow out of the open-ended appliance valve into apartment 2P.

According to the FDNY, while in the ambulance the tenant of 2P stated to a police officer in the presence of an EMT technician: "I went to light the stove pilot and it exploded." This accounts for the source of ignition.

The Con Edison employees failed to follow company procedures in several respects during the activities of July 25, 2009 at 14725 Sanford Avenue: they did not perform the bleeds following the integrity tests, they did not gas-in at least one appliance per riser, they proceeded with restoring gas service despite conditions in apartments (ex: lack of installed ACC valves) that contradicted their own procedures and the plumbers affidavits, apparently assuming that the plumbers would later take care of those conditions. Therefore, consideration must be given to whether these actions (or inactions) contributed to the incident.

If it is assumed that the plumbers and/or superintendent performed the bleed in apartment 2P and left the ACC valve open at that time, one could speculate that the incident could have been avoided if the Con Edison mechanics had performed this

activity. However, as discussed previously, the evidence indicates that the bleed more likely was performed in apartment 1P.

If the Con Edison mechanics had been following the procedure to gas-in at least one appliance at the furthest point on the riser, they would have had no cause to enter apartment 2P since it did not meet the criteria of being at the furthest point from the riser valve.

If Con Edison had refused to restore gas service to the M, P and G risers on July 25, 2008 based on lack of a Gas Turn-On Affidavit and/or observation of non-conforming conditions in several apartments (ex: lobby apartment of G riser, 6P), one could speculate that the incident could have been avoided. However, under the scenario that the bleed was performed in apartment 1P and the ACC valve in 2P was inadvertently left open after the successful integrity test, refusing to restore service on that day might only have postponed but not prevented the incident. The same event could have happened even if the Con Edison personnel had fully followed procedure G-11836.

#### Corrective Actions

The Con Edison procedure G-11836, Meter Turn-on and Turn-off for: Meter Changes, New Meter Sets and when Restoring Gas Service Inside Buildings after the Meter/Service has been Turned-off, has been revised to include provisions for:

- Documenting the time and location of the integrity test, and the time and location of where the pressure is relieved (bleed).

- In master-metered apartment buildings with three or more floors with multiple risers supplying apartments, the gas-in shall occur immediately after an acceptable integrity test of each riser in order to minimize the possibility that conditions change after the integrity test is performed and gas is introduced to the riser. If there is any delay in turning on the riser valve, the integrity test and continuity test shall be performed again prior to turning on the riser valve.
- The gassing-in and relighting of the appliance will occur at the furthest accessible apartment associated with that riser and the location shall be documented.
- The company shall verify the following in the apartments that are entered before the integrity test is performed:
  - an appliance shut-off valve is in place. If not the gas shall not be restored
  - visible piping is continuous and properly supported up to the appliance valve
  - all appliances valves are shut off and properly connected to appliances with standing pilots
  - all appliance valves are open and properly connected to all appliances with electronic ignition
  - all appliance valves that are not connected are closed and plugged, and that there are no open ended pipe and non-compliant fittings.
- Communication shall be continuous between employees performing the steps throughout this process.

Con Edison has conducted tail board meetings with covered employees who are responsible to perform turn-on's to review the incident and emphasize to need to follow company procedures.

Con Edison has also revised its training curriculum to include the requirements of the revised turn-on procedure, and has provided the revised training to its covered employees.

Attachment A

Gas Turn-On Affidavit for Risers A, F, N, T, Laundry Room

506  
# 327718  
EMERGENCY (718) 275-5638 7-24-08  
EXHIBIT "J"  
GAS TURN-ON AFFIDAVIT  
Complete All Sections that Apply

THIS CERTIFIES THAT THE GAS PIPING IN THE BUILDING INDICATED BELOW HAS SUCCESSFULLY PASSED A LEAKAGE TEST FOR \_\_\_\_\_ HOUR(S) / \_\_\_\_\_ MINUTES AT \_\_\_\_\_ PSI PRESSURE.  
147-25 SANFORD Ave.  
Flushing NY 7-24-08  
OWNER SIGNED \_\_\_\_\_ PLUMBING CONTRACTOR

CONTRACTOR TO CHECK APPROPRIATE CORRECTIVE CONDITION:  
 I HAVE REPAIRED Tested REPAIRED (Check all that apply)  
 Leak at gas equipment (specify unit) \_\_\_\_\_  
 Control Valve \_\_\_\_\_  
 Pilot Valve \_\_\_\_\_  
 Appliance Valve \_\_\_\_\_  
 Hood Draft \_\_\_\_\_  
 Appliance Regulator \_\_\_\_\_  
 Flue Connection(s) \_\_\_\_\_  
 Other (Specify) Tested Risers A, F, N, T AND Laundry Room  
for 1 Hour at 3 LBS PSI NO REPAIRS NEEDED. ALSO  
replaced gas cocks & flexes for these risers  
READY FOR GAS TO BE TURNED ON FOR ABOVE.  
THE CHIMNEY FLUE AND BASE:  
Have been cleaned from top to bottom

License # 973  
(718) 577-0800

Signature of Contractor \_\_\_\_\_ Date  
Have been inspected and found to be clean  
Signature of Contractor \_\_\_\_\_ Date 7-24-08  
Will Be Cleaned \_\_\_\_\_ Date

- 29B - (10-92)

14 JUL 24 08 PM 1:44

0608006652

FROM: LIBERTY PLUMBING FAX NO.: 718 577-0804 JUL 24 2008 10:54AM P1

Attachment B

Gas Turn-On Affidavit for Risers M, P, G

MPG RISERS  
Jul. 25 2008 9:18AM P1

FROM : LIBERTYPLUMBING

FAX NO. : 718 577-0804

100 RETAIL ENERGY ST

PAGE 01/01

506

FAX #

718-275-5632

EXHIBIT #3

GAS TURN-ON AFFIDAVIT

Complete all sections that apply

THIS CERTIFIES THAT THE GAS PIPE IN THE BUILDING INDICATED BELOW HAS SUCCESSFULLY PASSED A LEAKAGE TEST FOR \_\_\_\_\_ HOUR(S) / MINUTE(S) AT \_\_\_\_\_ PSI PRESS. RE.

14725 Sanford Avenue  
Flushing NY  
OWNER SIGNED \_\_\_\_\_  
DATE 7-25-08

CONTRACTOR SIGNED \_\_\_\_\_  
PLUMBING CONTRACTOR LIC. #

CONTRACTOR TO CHECK APPROPRIATE DEFECTIVE CONDITION: FOR EXAMPLE

I HAVE TESTED (Check all that apply)

- Leak at gas equipment (specify unit)
- Control Valve
- Pilot Valve
- Appliance Valves
- Block Draft
- Appliance Regulator
- Flue Connection(s)
- Other (Specify) TESTER RISERS M, P, G FOR 1HR AT 31.65 PSI

LICENSE # 973  
(718) 577-0800

NO REPAIRS NEEDED ALSO REPLACED GAS COCKS AND FLEXES FOR THESE RISERS READY FOR GAS TO BE TURNED ON FOR THE ABOVE.

Have been cleaned from top to bottom

Signature of Contractor \_\_\_\_\_ Date

Have been inspected and found to be clean

Signature of Inspector \_\_\_\_\_ Date 7-25-08

Will Be Cleaned \_\_\_\_\_ Date

Owner \_\_\_\_\_ Date

FR JUL 25 '08 PM 1:53

JUL-27-2008 10:31

99%

P.01

## Attachment C

### Excerpts from Con Edison's Procedure G-118365, **Meter Turn-on and Turn-off for: Meter Changes, New Meter Sets and When Restoring Gas Service Inside Buildings After the Meter/Service has been Turned Off.**

4.0 Turn-on Procedure and Integrity Test                      4.2 (a) An Integrity test shall be performed either by the meter dial test or using a manometer (U gauge).

(c) The integrity test, as set forth in NFPA 54, shall be conducted under normal line pressure. The test medium may be either natural gas, an inert gas, or air.

(f) Immediately after turning on the gas supply for the integrity test, the piping system shall be checked by observing a manometer or the meter dial to ascertain that there is no leakage or opening in the downstream piping system.

4.5 When testing with a U gauge, before removing the instrument or turning on the supply valve, go to the farthest accessible part supplied and relieve the pressure. A loss of pressure at the U gauge indicates the piping is continuous.

4.6 If the integrity test is acceptable, gas-in the piping starting with the farthest accessible part supplied, re-light the appliances and check that all appliances/equipment operate properly.

### 11.0 Restoring Gas Service Inside Buildings

11.1 Prior to restoring the gas service to a meter which has been locked off or isolated for inside repairs, a work authorization to restore service must be received from Energy Services. In an emergency situation, verbal approval from a qualified Energy Services representative is permitted. The gas ERC will generate an ECS ticket and dispatch the job to a qualified mechanic to perform the integrity test and/or turn-on.

11.3 Prior to restoring the gas service, an integrity test will be performed by Con Edison to establish the tightness of the customer's gas piping in accordance with section 4.0.

11.4 Before restoring the gas service to either a building or multi-dwelling (4 or more families) in which a plumber has corrected a warning tag condition, it is the responsibility of the building owner to provide all of the following:

(a) A Blue Card (or equivalent in Westchester) when required by the local building code requirements.

(b) An "Integrity Test Affidavit" signed by a licensed plumber including license number, confirming that all gas piping in accessible apartments is continuous and complete and all appliance valves are closed.

(c) Entry into a minimum of 10% of all apartments affected by the shut-off and at least one apartment on each affected riser. The Company will verify that all appliance valves, in the apartments that are entered before the integrity test is performed, are shut-off or the appliances have electronic pilot ignition and that the piping is continuous and properly supported up to the appliance valves.

(e) A shut-off valve for each appliance. See paragraph 4.2(g) for the exception for appliances having electronic ignition. If no appliance valve exists, the plumber shall install them as required by NFPA 54 and as incorporated into the NYC Building Code.

11.5 On risers for multi-dwelling buildings, Company personnel shall be responsible to gas-in the service. This includes at least one appliance at the furthest point on the riser(s). Company personnel, upon request, will assist the customer in turning-on and gassing-in the customer owned laterals and equipment. In these cases, the customer must provide access for Company employee to any part of the premises.

11.6 If the remainder of the turn-on is being performed by personnel other than Gas Distribution Services,

Energy Services will obtain a "Gas Turn-on Affidavit" and shall notify the Gas Emergency Dispatcher.

## Attachment D

### Review of Applicable Records

Staff requested and reviewed documentation required by Con Edison's procedures relevant to the shut-off and turn-on of the gas supply to the incident building. Documents provided included a Class "A" Warning Tag, Blue Card issued by the NYC Department of Buildings, Integrity test and Gas Turn-on Affidavits, and Work Orders. The results of the review are as follows:

#### **Warning Tags**

A Class "A" Warning Tag (#QL08002840) was issued on June 11, 2008 for the entire building for safety, following a fire within apartment 5G. The responding NYFD shut-off the head-of-service valve to the building in order to secure the gas supply. The responding Con Edison GDS mechanic locked the head-of-service valve as well as the meter to the building.

#### **Blue Card**

On June 27, 2008 a NYC Buildings Department representative inspected approximately 80 feet of  $\frac{3}{4}$  inch gas piping from the existing meter to the existing boiler. The electronic inspection record (Blue Card) was filed and available to Con Edison on the NYC Buildings Department database. The actual 3 psig test was performed on June 26, 2008 and self certification documentation was filed by the plumber with the NYC Buildings Department.

#### **Gas Turn-on and Integrity Test Affidavits**

Gas Turn-on Affidavits required by Con Edison procedure G-11836 were submitted by the contract plumber for turn-on's performed on July 1, and July 25, 2008 (two separate affidavits,

one of which included risers G, M, and P. Con Edison could not provide a turn-on affidavit for the turn-on performed July 23, 2008 (riser B). Electronic case notes kept by Con Edison indicate that a turn-on affidavit was requested and received, but it appears that it was misplaced.

Integrity test affidavit(s), again required by Con Edison's procedure G-11836, were not filed by the plumber nor collected or requested by Con Edison for any of the turn-on's performed.

### **Work Orders**

On July 1, 2008 an electronic Gas Turn-on Work Order (QG08005825) was dispatched to a GDS mechanic with instruction to turn-on the line to the boiler. The mechanic performed an integrity test of the piping from the head-of-service valve to the boiler only. The house side of the meter, which included all the risers, was left off and locked during the test. Upon completion of the integrity test, the head-of-service valve was unlocked, opened, and gas service was restored. A Con Edison Energy Service Representative was present during this process. The gassing-in of the boiler, as documented, was to be performed by the plumber, which was not in conformance with Procedure G-11836 section 4.6.

On July 23, 2008 an electronic Gas Turn-on Work Order (QG08006625) was dispatched to a GDS mechanic with instructions to perform an integrity test of the "B" riser only. Con Edison's Energy Services Department was in receipt of the turn-on affidavit and "Blue Card." The mechanic documented that an integrity test of the manifold piping and the "B" riser was performed and witnessed by a Con Edison supervisor. The gassing-in of the appliances (six gas ranges, one for each apartment) was to be performed by the plumbing contractor

(again, not in conformance with G-11836 section 4.6). The mechanic also documented that the riser valve to the dryers in the laundry room was left off and locked.

On the evening of July 23, 2008 a GDS mechanic was dispatched to investigate an inside odor call (QL08003378). The mechanic documented that an inside leak investigation was conducted, appliance checked, and no odor or gas readings were detected in apartments 2B or 2C.

An electronic Gas Turn-on Work Order (QG08006652) was issued on July 25, 2008 and dispatched to one of the two GDS mechanic's involved in the incident. The instructions on the work order were to turn-on risers A, F, N, T, and the laundry room. No mention of risers G, M, or P was included. As per Energy Services the gas turn-on affidavit was on file and a Blue Card was not required. The final entry to close the work order states that the plumber and building supervisor were on location and integrity tests of risers A, F, N, M, P, G, and laundry room were performed. The plumber was to gas-in the appliances in the apartments (not in conformance with G-11836 section 4.6).

#### **Qualification of Con Edison Personnel**

The two Gas Distribution Services (GDS) mechanics involved in the integrity tests and gassing in process on July 25, 2008, as well as their immediate supervisor who was also present, were all qualified as "A" mechanics. All three were fully qualified to perform the required integrity tests and gassing in process as described in Con Edison's procedure G-11836.

#### **Odorization**

16 NYCRR §255.625 - Odorization of Gas

(b) All gas transported in distribution mains, except as provided for in subdivision 255.625(a), and service laterals is to be adequately odorized in compliance with subdivision 255.625(c) so as to render it readily detectable by the public

and employees of the operator at all gas concentrations of one tenth of the lower explosive limit and above.

(e) Each operator shall establish procedures to conduct periodic sampling of combustible gases to assure the proper concentration of odorant in accordance with this section. An appropriate record of all odorization practices shall be maintained.

Odorant sampling in Queens is spread out geographically and is conducted on the third Sunday of every month. The most recent test prior to the incident was performed on July 20, 2008 and indicated that the gas was adequately odorized and detectable at concentrations of one-tenth the lower explosive limit (LEL) and above.