National Transportation Safety Board
Office of Railroad, Pipeline and Hazardous Materials Investigations
Pipeline and Hazardous Materials Division
Washington, DC 20594

Regulatory Oversight
Factual Report

Dec. 2, 2014

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2 Accident Details

Operator: Consolidated Edison Company of New York, Inc. (Con Edison)

Location: East Harlem – Manhattan, New York

Date: March 12, 2014

Time: 9:30 a.m. (Eastern Standard Time)

Component: 2-inch High-Density Polyethylene (HDPE) gas service line, 8-inch HDPE, and 8-inch Cast Iron (CI) gas distribution main and 12-inch Cast Iron (CI) water main

3 Accident Summary

On March 12, 2014, at about 9:30 a.m.[1], two adjacent, multi-use, five-story tall buildings were destroyed by an explosion and resulting fire. The buildings were located on the west side of Park Avenue between East-116th Street and East-117th Street in the East Harlem district of the Borough of Manhattan, in New York.

The destroyed structures were located at 1644 and 1646 Park Avenue. Natural gas to these two buildings is provided by Con Edison. Prior to the explosion on March 12, Con Edison received a call to its Customer Service Department at about 9:06 a.m.[2] regarding natural gas odor from an individual residing at 1652 Park Avenue, a building located adjacent to the explosion site. Con Edison dispatched a crew to investigate; however, explosion occurred before he arrived at the scene.

Within minutes of the explosion the New York Police Department (NYPD) and the Fire Department of the City of New York (FDNY) responded to the explosion and first FDNY unit arrived at the scene at about 9:33 a.m. The gas flow to the 8-inch low pressure (about 1/3 pounds per square inch, gauge) pipeline that was supplying natural gas to the two exploded structures through smaller diameter distribution pipeline was stopped by Con Edison at about 1:44 p.m.

Fire suppression and recovery activities continued for six more days. The violent explosion damaged adjacent buildings and buildings on the east side of Park Avenue and along East-116th Street and East-117th Street. The Metro-North railroad suspended rail service on March 12, 2014, for about 7½ hours on the elevated railway along Park Avenue due to debris on the track. Eight people died and more than 48 people were injured as a result of this accident.

[1] All times are in eastern daylight times except otherwise specified.
[2] See Survival Factor Factual Report for comprehensive timeline details.

Figure 1: Photograph (looking west) of the accident scene with Google Earth inset showing the collapsed buildings 1646 and 1644 Park Avenue. Credit: FDNY.

4 Federal Regulations Title 49 CFR Part 192

The U.S. Department of Transportation's (DOT) Pipeline and Hazardous Material Safety Administration (PHMSA) oversees the national regulatory program for the safe transportation of natural gas through its Office of Pipeline Safety (OPS). Following the passage of The Natural Gas Pipeline Safety Act of 1968, OPS established the minimum safety standards for natural gas transmission and distribution pipeline operators under Title 49 of the Code of Federal Regulations (49 CFR), Part 192; adopted in 1971.

While the Federal government has the responsibility of developing, issuing and enforcing pipeline safety regulations, the federal pipeline safety statutes include a provision for the state to assume the intrastate regulatory, inspection and enforcement responsibility under an annual certification program administered through the Pipeline, and Hazardous Materials Safety Administration (PHMSA). With over two-million miles of pipeline nationwide, the OPS partners with state regulators to assist with the responsibility of ensuring safe pipeline operations.

5 New York State Natural Gas Oversight

Title 49 United States Code section 60105(a),[3] "State pipeline safety program certifications" allows states, which perform annual certification through the Secretary of Transportation, to inspect and enforce intrastate pipeline safety. When qualifying for certification, a state must adopt the minimum Federal regulations for pipeline safety; however, states may mandate more stringent safety regulations as long as they are not in conflict with the established Federal minimums. States agencies that do not satisfy the certification requirements have the option to undertake specific portions of the pipeline safety program from PHMSA

The New York Public Service Commission (NYPSC) is certified with the Secretary of Transportation as the state agent responsible for inspecting both interstate and intrastate natural gas and hazardous liquid lines for the Office of Pipeline Safety. The NYPSC is comprised of a five-member board selected by the Governor and confirmed by the State Senate. The PSC currently has 27 inspectors divided into four regions[4] that cover the State of New York. In addition to some smaller regulated pipelines, the NYPSC oversees about 49,000 miles of distribution pipeline, 3,400 miles of transmission pipeline, and over 100 miles of steam piping for the state.

Under the certification agreement with PHMSA, the NYPSC conducts inspections and enforcement on intrastate pipelines and acts as the PHMSA agent, conducting only inspections of interstate pipeline operators.[5] The tables below reflect the number of inspections conducted by the NYPSC in 2013.[6]

[3] Title 49, subtitle VIII; chapter 601 section 60105, "State pipeline safety program certifications"
[4] New York City (7), Albany (3), Syracuse (6), and Buffalo (5)) and a main office in Albany (6)
[5] New York is one of eight states that act as the PHMSA agent for the inspection of interstate pipelines. Enforcement of the federal regulation is conducted by DOT Office of Pipeline Safety

[6] Tables 1, 2 and 3 : Generated in response to question on Interview of Kevin Speicher (August 5, 2014)

Table 1: LDC Inspections completed by the NY PSC in 2013

2013 NYPSC Local Distribution Companies Inspected						
	Operators	**Operators Inspected**	**% Inspected**	**Units[7]**	**Units Inspected**	**% inspected**
Private	16	16	100	64	64	100
Municipal	2	2	100	2	2	100
LNG	3	3	100	3	3	100

Table 2: Transmission Companies Inspected by the NYPSC in 2013

2013 Transmission Companies Inspected						
	Operators	**Operators Inspected**	**% Inspected**	**Units**	**Units Inspected**	**% inspected**
Intrastate	23	17	73.9%	23	17	73.9%
Interstate[8]	13	3	69.2%	30	14	46.7%

Table 3: Gathering Companies inspected by NYPSC in 2013

2013 Gathering Companies Inspected						
	Operators	Operators Inspected	% Inspected	Units	Units Inspected	% Inspected
	12	3	25	12	3	25

6 New York State Regulations for Natural Gas Transmission and Distribution

New York State natural gas pipeline safety regulations are published in the Codes Rules and Regulations (NYCRR) of the State of New York. Issued in 1960, the NYCRR is a 23-volume compilation of state agency rules and regulations adopted under the State Administrative Procedure Act or SAPA.[9] The NYCRR is the State equivalent of the Code of Federal Regulations where rulemaking has the force of law. The state rule and regulations

[7] Units - The units are defined by the NYSDPS as part of how it approaches audits. Namely: "Operating Headquarters" or "OHQ's".
[8] Interstate inspections are dictated by PHMSA
[9] Pipeline safety rules were originally created in New York State on November 7, 1952. Case 15686

governing natural gas transmission and distribution are contained under NYCRR Title 16, part 255, "Transmission and Distribution of Gas." [10]

Natural gas distribution safety and oversight, under part 255 of the NYCRR, is the responsibility of the New York Department of Public Service. The NYDPS must follow a rulemaking process when proposing changes to the NYCRR, including the adoption of the latest revision of 49 CFR part 192. The process of proposing a change to the NYCRR may be initiated by staff, or the commission. Once a proposed change is drafted by staff it is reviewed by the commission and the commission authorizes the proposed rule changes by issuing a Memorandum and Resolution, A notice of proposed rulemaking, in addition to the documents required by SAPA 202, are published in the State Register for public comment. The commission receives and reviews the comments and the proposed rule is either adopted or it is amended and re-issued for additional period of public comment if substantive or significant comments were received. According to the NYPSC, the typical rule making process can take between 12 and 18 months.

Investigators reviewed the NYCRR Title 16, part 255 following the accident for inconsistencies with the Federal Minimum standards of 49 CFR part 192, which are incorporated by reference under NYCRR Title 16, part 10.2. The investigation identified at least two sub-sections of the State regulations that were less stringent than the Federal regulations. These included the definition of "service line" and pressure test requirements for short sections of newly installed pipe. In September, the NYPSC commenced a rulemaking by filing Notice of Proposed rulemaking[11] in the State Register to bring specific sections of the New York state regulations into alignment with the federal minimums (refer to section 8.3 of this report). No information at this time has been obtained from PHMSA regarding the certification of the New York State program for fiscal year 2015.

6.1 NY State Regulations and Definition of a Service Line

The first discrepancy noted was in the definition of service line. Under 49 CFR part 192.3, the operator is responsible for a service line from the distribution main to the outlet of the gas meter, whereas under NYCRR part 255.3, the operator is responsible for the service line up to the first fitting entering the building. The distinction between the two definitions is limited to cases where the gas meter is located inside a building, as is common in New York City. Under this scenario and the NY state regulation, the operator's responsibility to maintain a service line ends at the first fitting beyond the wall; there is no leak survey or maintenance for that portion of the service line that falls between the first fitting inside the building and the gas meter (see figure 2).[12] Under the Administrative Code of City of New York part 27-896, this interior plumbing may be installed by either a licensed master

[10] NYCRR Title 16, Chapter III, Subchapter C, part 255, "Transmission and Distribution of Gas"
[11] State of New York Public Service Commission Case 14-G-0357, "In the Matter of Revising 16 NYCRR Gas Safety Regulations for Consistent Application of More Stringent Federal Gas Safety Standards in 49 CFR"
[12] In some circumstances New York's definition of service line extends jurisdictional facilities further than 49 CFR Part 192, such as when a gas meter is installed at the curb, property line, or otherwise outside the building wall.

plumber or the gas utility and must comply with the NFPA 54 standard,[13] "The National Fuel Gas Code," which is incorporated by reference in the NYCRR. Under the federal definition of service line, the operator remains responsible for the maintenance and leak survey of the service line up to the outlet of the gas meter.

New York State: NYCRR Title 16 part 255.3 Service Line Definition

"The piping, including associated metering and pressure reducing appurtenances, that transports gas below grade from a main or transmission line to the first accessible fitting inside a wall of the customer's building where a meter is located within the building; if a meter is located outside the building, the service line will be deemed to terminate at the outside of the building foundation wall."[14]

Federal Code of Regulations: 49 CFR part 192.3 Service Line Definition

"A distribution line that transports gas from a common source of supply to an individual customer, to two adjacent or adjoining residential or small commercial customers, or to multiple residential or small commercial customers served through a meter header or manifold. A service line ends at the outlet of the customer meter or at the connection to a customer's piping, whichever is further downstream, or at the connection to customer piping if there is no meter."[15]

[13] NFPA 54, ANSI Z223.1 provides minimum safety requirements for the design and installation of fuel gas piping systems in homes and other buildings
[14] NYCRR Title 16 part 255.3, "Definitions"
[15] 49 CFR, Subpart A; part 192.3, "Definitions"

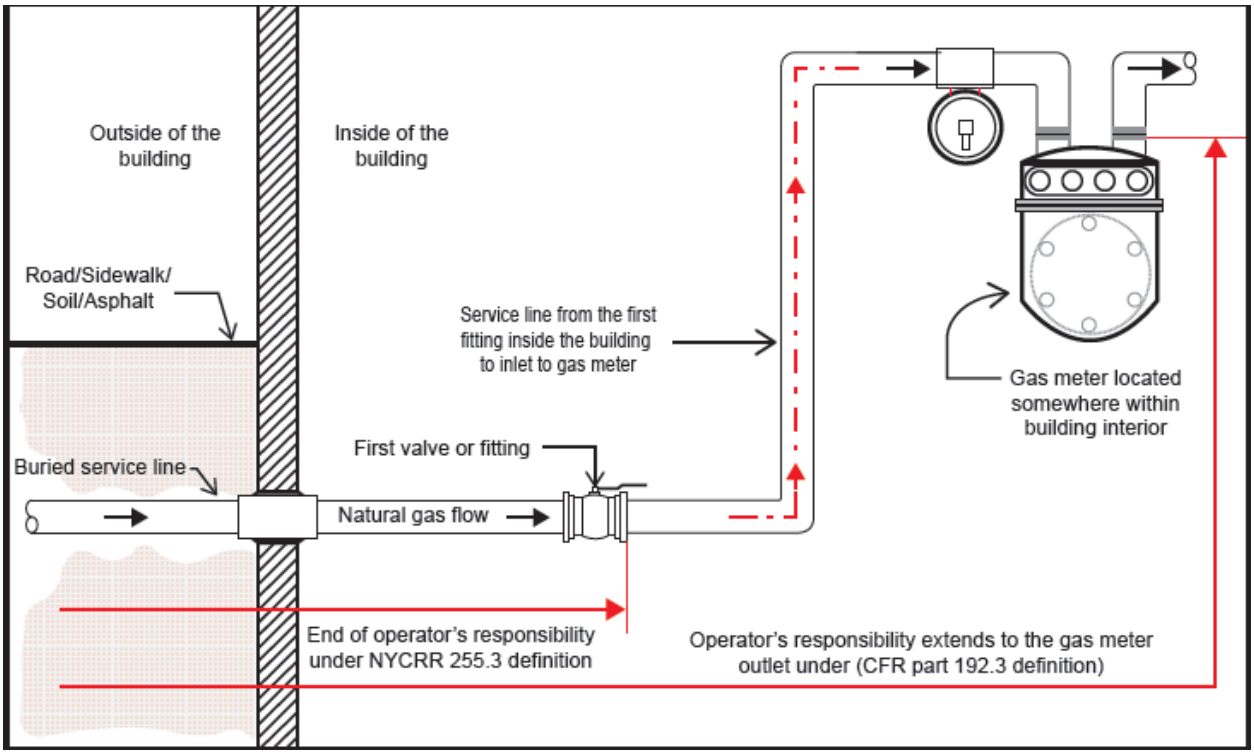

Figure 2: Schematic showing discrepancy between the federal code definition of Service Line and the NY State definition of service line, when a gas meter is installed inside of a building.

The NYCRR contains a separate requirement under 16 NYCRR part 261 "Piping beyond the Meter"[16], that addresses some of the gaps in responsibility of internal piping. Part 261 requires that the operator have a written operating and maintenance plan that includes making customers aware of hazardous conditions relating to their gas appliances and piping installations. When an operator has access to a residential premise for the purpose of responding to a complaint of a gas odor or suspected carbon monoxide, all operating vent-connected gas equipment shall be checked for flue spillage or possible malfunction even if the inquiry into the cause of the visit has been satisfied.

In addition, the operator is required to have a warning tag procedure[17] designed to make customers aware of hazardous conditions related to gas appliances and piping installations. Whenever an operator recognizes a condition whereby a gas appliance or gas line may cause a hazard to life or property, if allowed to operate in its current condition, the operator is required to attach a warning tag to the appliance, piping or meter. The conditions requiring tags are classified as A, B or C. If a Class A or B condition is located in an apartment building, the operator must post a notice in a prominent location that describes the condition and alerts tenants that a tag was issued.

Class A conditions represent the most severe cases and an immediate hazard that may include any leaking gas piping inside the building, which cannot be stopped by temporary or

[16] NYCRR Title 16, part 261
[17] 16 NYCRR part 261.55

permanent repair. Class A conditions require that the operator shut off the gas and lock the meter unless the leak can be isolated from the rest of the system. Class A conditions in New York City require the operator to notify the New York City Department of Buildings. Class B conditions are considered an immediate hazard and require the operator to shut off gas but does not require the meter to be locked. Class C conditions are those that do not present immediate hazards, although they may become hazardous if not corrected. Class C conditions do not require the operator to shut off gas. Part 261 also states that isolation of the most severe conditions occurs at the gas meter and does not make reference to the first fitting or valve inside the building. Operators may only remove a warning tag once gas service has been restored or a requested inspection is made and the operator has verified that the condition has been corrected.

6.2 NY State Regulations Plastic Pipe Pressure Test Requirements

A second discrepancy identified between the federal code and New York state regulations relates to pipelines and pressure testing. Under 16NYCRR, part 255.507, "Test requirements for pipelines to operate at less than 125 psig" allow operators to forego a pressure test and perform only a leak test for short sections of pipe. The state requirement is less stringent than the federal code 49 CFR part 192.513(c) which explicitly requires a pressure test to 150 percent of the maximum operating pressure or 50-psig, whichever is greater and regardless of length. When a 69-ft section of 8-inch plastic main was installed in 2011, to replace a section of cast iron pipe,[18] Con Edison performed a leak test, at the operating pressure of about 8-inches of water column. Under federal regulations, it would have required a pressure test to 50-psig minimum, regardless of length.

New York State: NYCRR Title 16 part 255.507(f)
Test requirements for pipelines to operate at less than 125 psig

"On short sections (100 feet (30.5 meters) or less) of pipe, and tie-in sections, where all joints, uncoated portions of longitudinal seams, and/or fittings are exposed, a soap test is acceptable at line pressure. For short sections of plastic pipe, the entire pipe length must be soap tested. Gas may be used as the test medium at the maximum pressure available in the distribution system at the time of the test."

[18] About 70 feet of 8-inch HDPE was installed in front of 1642 Park Avenue in December 2011

Federal Code of Regulations: 49 CFR part 192.513(c) **Test requirements for plastic pipelines**
"The test pressure must be at least 150 percent of the maximum operating pressure or 50 psi gage, whichever is greater…"

7 New York State PSC Audits and Inspections

The NYPSC is responsible for developing an inspection program and conducting intrastate inspections of the regulated state operators. In order to carry out annual inspections, the PSC has developed an annual program written plan and 5-year plan, consisting primarily of operations and maintenance functions. In the 5-year plan, the PSC has broken out each of the code sections, of 16NYCRR part 255 and 261, into three risk categories: high, moderate, and low risk. Conditions classified as high-risk in the code are inspected every year, while code requirements considered moderate risk are inspected at least every three years, and low risk code requirements inspected at least once every five years.

Within its 5-year plan, each section of the state code is identified as either a 'records' audit or 'field' inspection. Record audits are performed at the operator's office and may include areas such as operations procedures and leak survey records. When record audits are conducted, the PSC calculates the minimum sample size required to generate a 95% confidence level and 15% margin of error from the total records available. Once the sample size has been determined, the PSC uses a random number generator to figure out which records will be audited for compliance. NYPSC inspectors conduct inspections of the code that are identified as field inspections at an operator's job site. State inspectors show up unannounced to a construction or operations activity and observe the work being performed and review the work against an Operator's written procedure and state regulations. In addition, operator qualifications are checked for individuals performing covered tasks.[19]

On May 13, 2014, Staff of the NYSDPS, the staff arm of the NYPSC, learned from Con Edison during the course of Staff's independent investigation that the contractor employee who performed the plastic fusing of the 2-inch service tee at 1642 Park Avenue, in 2011, had expired operator qualifications at the time the fusion was performed. Operator qualifications and expiration dates for employees and contractors performing work for Con Edison were tracked by Con Edison in a training database in the company's Learning Center; however, Con Edison relied on the contractor to manage the expiration dates of their personnel qualifications. In order to look for violations to the operator qualification program, the PSC relies on field inspections. The PSC did not have in its written plan a 5-year plan line item specifically addressing operator qualifications and expirations; however, these same field audits are used as a means for the NYPSC to identify individuals performing work with expired qualifications. Field inspections are a means of observing

[19] Covered task is defined under 49 CFR Part 192 Subpart N, "Qualification of pipeline personnel" and 16 NYCRR §255.3(40).

covered tasks[20] and whether the tasks are being performed as required under the procedure and by qualified individuals.[21] Therefore, when visiting a construction site, the PSC inspector will request to see the operator qualification card. Previous NYPSC audits of Con Edison did not identify the lapse in operator qualifications or Con Edison's failure to follow its own operator qualification procedures for plastic fusion; however, the NYPSC auditors have cited Con Edison for operator qualification lapses in tasks other than plastic fusion.

7.1 Previous Citations or Violations Issued Against Con Edison Near Incident Site.

NTSB investigators requested the last 5-years' worth of citations and violations issued to Consolidated Edison for operation and maintenance practices within a quarter mile of the East Harlem accident location. The NYPSC identified 24 violations in the borough of Manhattan with only one violation occurring near the accident location. The violation appears in the 2011 record audit and involved the inspection of a service line valve to a building of public assembly exceeding a 15-month interval.[22] As mentioned above, there were no violations reported by the NYPSC for plastic fusion operator qualifications or expired operator qualifications for the 5-years preceding the accident.

8 Post accident actions

The NYPSC opened its own investigation into the East Harlem incident, based upon concurrent state jurisdiction, as well as an investigation into Con Edison's (and all LDCs statewide) operator qualification practices for plastic fusions, requiring risk assessments of the result of those practices.[23] The NYPSC has met and traded correspondence with Con Edison over issues including leak response and operator qualification of plastic fusing. The NYPSC has required that Con Edison assess the safety of plastic piping installed between 2002 and 2014 when its employees and installers were not qualified to the Con Edison plastic fusion procedure.

8.1 Public Awareness and Use of 911 for Gas Odor Complaints

Beginning on May 20, 2014 the NYPSC issued correspondence to the Con Edison Chief Executive Officer expressing concern over the increased number of gas odor complaints that were being made following the March 12, 2014 Harlem natural gas explosion. The

[20] Covered task is defined under 49 CFR Part192 Subpart N, "Qualification of pipeline personnel" and 16 NYCRR part 255.3(40)
[21] Qualified is defined under 49 CFR Part192 Subpart N, "Qualification of pipeline personnel" and 16 NYCRR part 255.604
[22] The violation occurred at 11395 5th Ave., Manhattan, NY. The violation was against a state regulatory requirement under part 255.748(b) and not the federal regulations.
[23] Case 14-G-0212, "Proceeding on Motion of the Commission to Investigate the Practices of Qualifying Persons to Perform Plastic Fusions on Natural Gas Facilities," Order Investigating the Practices and Obtaining Information Concerning Plastic Fusions on Natural Gas Facilities (effective June 27, 2014)("NYPSC Plastic Fusion Order")

NYPSC points out that the number of complaints reported to Con Edison had doubled since the time of the accident and the PSC wanted to make certain that Con Edison was capable of responding effectively to these odor complaints.

In its response to the NYPSC on June 10, 2014, Con Edison stated that they were taking measures that included "working more closely with the City of New York in several areas, including with local emergency services to use the 911 emergency calling systems for the public to report gas odors in order to reduce response time."[24] In addition, Con Edison discussed assigning additional resources to assist in investigating odor complaints, developing enhanced public education materials that highlight the importance of reporting gas leaks.

On June 23, 2014, the NYPSC wrote to Con Edison[25] requesting copies of the written protocols that describe how 911 gas odor and leak reports, that the FDNY responds to, will be coordinated with Con Edison. The PSC makes reference to the document produced by the City of New York titled, "New York City Underground Infrastructure Working Group." which also states that the 911 emergency number will be used as an additional means for the public to report gas odors. Con Edison's reply to the NYPSC references the company specifications G-11809, "Outside Leak Investigations" and G11837, "Inside Leak Investigation." In addition, Con Edison stated that the City of New York "has urged Con Edison to inform the public that gas odors can be reported to 911 for the prompt response of the FDNY." Con Edison began a public awareness campaign during the week of March 17, 2014 to encourage the public to notify 911 or Con Edison in the event of a suspected gas odor.

Con Edison further stated in the response to the NYPSC that, "While the June, 2014 report of the New York City Underground Infrastructure Working Group apparently suggests that the public call only 911 to report gas odors, it is not Con Edison's intention to discourage reporting to the 1-800-75-CONED. The Working Group that promulgated the report consisted solely of representatives of the City, and although Con Edison has been working with the City regarding implementation of report recommendations, we did not contribute to tor review the report before it was released." At the directives of the NYSDPS, Con Edison and National Grid have continued to develop coordinated training with the FDNY to improve the response procedures used by the utilities and the FDNY in New York City.

8.2 Operator Qualifications

On May 21, 2014, the NYPSC issued correspondence to the Con Edison Senior Vice President of Gas Operations citing a potential violation involving the annual qualification of its contractors to perform plastic fusing. The letter indicated that although the installer of the failed service tee (installed at 1642 Park Avenue) may have been qualified under the Northeast Gas Association's Operator Qualification Program for work on the National Grid

[24] Letter from Craig S. Ivey, President of Con Edison. Addressed to Audrey Zibelman, Chair NYPSC; dated June 10, 2014. In response May 20, 2014 correspondence from the NYPSC.
[25] Letter from Audrey Zibelman, Chair NYPSC to Edward Foppiano, Senior Vice President – Gas Operations; dated June 23, 2014.

system, his qualifications for work on the Con Edison system had lapsed at the time of the installation. His annual requalification of plastic fusing was supposed to have occurred by November 25, 2011 but lapsed; the failed tee was installed in late December of 2011. In addition to other requests, the NYPSC requested a list of all the work performed by contractors whose annual requalification had expired as well as all of the plastic fusion work completed by the employee that had installed the tee at 1642 Park Avenue, after November 25, 2011.

Con Edison replied to the NYPSC request and identified 136 jobs (120 low-pressure and 16 high-pressure), between November 2011 and November 2013, where the contractor that installed the tee at 1642 Park Avenue had performed plastic fusion with expired qualifications. Con Edison noted that they identified a total of twelve, out of thirteen total contractor employees, that perform plastic pipe installations, who had varying periods where their qualifications had expired. Con Edison estimated about 700 jobs, involving plastic pipe, were performed by this construction firm and its employees. Con Edison's response also provided details concerning its initiative from May to July 2014 to requalify all of its contractors and employees who perform plastic fusion work.

On June 27, 2014, the NYPSC issued the Plastic Fusion Order to investigate Con Edison and its practices of qualifying persons to perform plastic fusions on natural gas facilities. The NYPSC had learned of the operator qualification violation through it investigation of Con Edison and not through the course of its field inspections. In its Plastic Fusion Order, the NYPSC noted that "…staff has found no evidence that Con Edison placed into service any pipe that had not been fused according to acceptable procedures and specifications…", however, the commission was requiring Con Edison to provide records of compliance and non-compliance with the state regulations, which Con Edison continues to provide the NYPSC as company inspections continue.

The order stated that Con Edison had failed to comply with natural gas safety regulations for plastic fusion qualification, which required, that employees and contractors submit to plastic fusion for both a visual inspection and destructive test in the classroom. Con Edison was not destructively testing the sample fusion joints prepared during annual requalification. In addition, Con Edison had failed to timely requalify its employees and contractors on an annual basis as required under their procedures. The order contained twelve items that required Con Edison to take corrective action or provide details within five to fifteen days. Some of these requirements were:

- Identify how the company will ensure (through inspection or other means) that the plastic fusion work performed by unqualified contractors or employees, between 2011 and 2013, is not defective or result in "adverse consequences."

- Provide documentation showing how the company will continue to ensure that employees and contractors are qualified or re-qualified to perform plastic fusions in the future.

- Commence continuous leakage detection surveys (as defined under 16NYCRR 255.3) over all plastic fusion facilities joined by the plastic fusion process until the NYPSC directs otherwise.

- A list of persons tested since May 29, 2014 (the date when Con Edison began to requalify contractors and employees correctly to their procedures) and a list of persons that failed to requalify.

In its response to the NYPSC, filed on July 2, 2014, Con Edison described its actions to remediate the lapses in operator qualifications and re-qualifications. As described in that filing, Con Edison stopped all plastic fusion work until such work could be performed by fully qualified installers (employees and contractors who perform plastic fusion work).

In order to requalify installers, Con Edison brought in experts from the Northeast Gas Association to oversee the requalification process, which required its installers to demonstrate proficiency by making the five requisite types of fusion joints in accordance with all applicable standards, including destructive testing of each such specimen joint for integrity.

Con Edison's July 2, 2014 response also highlighted the steps they were taking to address the requirements of the NYPSC order. In order to address the concern over ensuring the safety of the plastic installed by its improperly qualified employees and contractors, Con Edison reiterated their existing programs for material selection, training, visual inspection; pressure testing, and leakage tracking. The response identified two additional initiatives involving enhanced leakage surveys and on-site fusion joint inspection that would improve the existing programs.

In the July 2, 2014 response to the NYPSC, Con Edison proposes the use of "high speed" mobile leak survey equipment under a pilot program. These mobile surveys would be capable of surveying about 300 miles of gas distribution main per week and eventually increasing the frequency of Con Edison distribution main surveys from once per year to thirteen times per year. In addition, Con Edison briefly mentions a program that the company is developing to provide on-site inspection of existing plastic fusion joints that are exposed during work.

In the July 2, 2014 response, Con Edison reasserts the measures currently in place to ensure that fused plastic joints are made correctly. Under visual inspection, Con Edison states that, "The use of visual quality inspection is the current industry standard method for evaluating the quality of field fusion joints; it also satisfies the field fusion inspection code requirements." Con Edison describes a visual acceptable sidewall saddle fusion joint as one that has three complete fusion beads around the entire joint. Con Edison maintains, in their response, that the pressure testing of the lines to 90 psig on low pressure lines and leak testing (soap test) where pressure testing is not possible, "provides assurance they are leak free." In addition the company points to the plastic failure database that is maintained by the company. They reported to the NYPSC that between January 2011 to the time of their response, that in 222 miles of installed plastic mains and 46,000 services and

associated fittings, there had been four fusion related leaks reported and only one related to workmanship.

In a July 7, 2014 follow-up response to the Commission, [26] Con Edison shared results of the requalification testing of its employees and contractors on plastic pipe fusion. According to the Con Edison response[27], 155 contractor employees and 288 Con Edison employees were tested and qualified for plastic fusion. The qualification included butt fusion joints, electrofusion fittings, and sidewall fusion. Of those tested, 25 Con Edison employees and 37 contractors failed; 34 of those tested failed the Sidewall fusion qualification test. However, all involved installers were successfully re-qualified before they were allowed to perform plastic fusion works.

8.3 NYPSC NPRM to Align the State Regulations with Federal Regulations

On September 8, 2014 the NYPSC issued Notice of Proposed Rulemaking (NPRM) to revise 16NYCRR Part 255, subchapter C to, "make them at least as stringent as the corollary federal rules - 49 CFR Part 192 -Transportation of Natural and other Gas by Pipeline: Minimum Federal Safety Standards." [28] If adopted, these changes will bring the New York State pipeline safety regulations inline with the Federal minimum safety standards. In this advanced notice of proposed rulemaking the Commission is proposing:

- The adoption of the federal definition of Service Line as stated under 49 CFR 192.3
- Changes to the 16NYCRR 255.723 regarding leakage surveys which, with the adoption of the federal definition of service line, require local gas distribution companies (LDC's) to perform leakage surveys of piping interior to a building, upstream of the meter.
- Elimination of soap testing (leak testing) under 16NYCRR 255.507 for short sections of piping before it is placed in service.
- Eliminate the option for operators to throttle the maximum allowable operating pressure (MAOP) at least once every five years in order to maintain the MAOP in cathodically unprotected steel pipelines.
- Eliminate the exception from gas odorization in transmission pipelines where the gas is being transported to storage facilities.

[26] July 7, 2014 response from Con Edison to Kathleen H. Burgess of the NYPSC
[27] NYPSC Case No. 14-G-0212; Con Edison correspondence to the NYPSC, July 7, 2014; appendices A and B.
[28] State of New York Public Service Commission; Case 14-G-0357, "In the Matter of Revising 16 NYCRR Gas Safety Regulations for Consistent Application of More Stringent Federal Gas Safety Standards in 49 CFR"; issued September 8, 2014

9 Prior Con Edison Accidents Investigated by the NYPSC

The New York PSC provided accident investigation reports from three previous Con Edison accidents involving natural gas releases and ignition that occurred in Queens between 2007 and 2009.

9.1 Case 08-G-0415 (Sunny Side) Queens, NY; November, 2007

On November 21, 2007 at about 4:35 p.m., a natural gas explosion occurred in the basement of a residence at 48-19, 41st Street in Queens, NY. A person in the basement at the time of the explosion suffered burns and later died from the injuries sustained in the explosion. The investigation into the cause revealed that the source of natural gas was a cracked 6-inch cast iron main located in the street directly in front of the residence involved in the accident. The cast iron failure was likely due to "significant graphitic corrosion in the pipe wall and settlement-induced bending stresses imposed on the main over a long period of time, and likely exacerbated by the presence of a nearby electric service box." The leaking natural gas had apparently migrated along the sewer lateral and into the basement of the home through an opening in the foundation.

The first call was made at 3:22 p.m. to the NY City Fire Department reporting an inside gas odor, two buildings away from the accident location (48-15 41st Street). The Fire Department arrive on-scene at 3:29 p.m. and notified Con Edison of a gas odor in front of 48-15 41st Street at 3:31 p.m. They Fire Department checked for gas at that building as well as the buildings on either side (48-13 and 48-17). When Con Edison personnel arrived at 4:04 p.m., the Fire Department told them that the buildings were clear of gas except for 48-15.

According to the NYPSC report, the Fire Department failed to specify what other buildings were checked and the Con Edison mechanics failed to ask. Con Edison verified that there were gas readings inside the building at 48-15 and then told the Fire Department that they would take over; the fire department left the scene. The Con Edison mechanic requested additional personnel from his office and continued to take gas readings in the area. The Con Edison mechanic also requested that the Fire Department return to assist in moving a vehicle that interfered with the leak investigation. While taking gas readings, the mechanic was approached by the resident from 48-20 that complained of a gas odor. The Con Edison mechanics took readings at 48-20 that confirmed the presence of gas and began ventilating the structure. As the mechanics were leaving 48-20, the explosion occurred at 48-19. At the time, the Fire Department was returning to the scene to assist with the vehicle removal; and the additional Con Edison personnel had not yet arrived at the scene.

The NYPSC investigation found that, "improvement in procedures and in communication and coordination between Con Edison and the FDNY at leak/emergency sites are needed to assure that the extent of potential hazards at gas leak response locations are fully assessed." The most critical issue identified in the NYPSC report was that the FDNY was released from the scene before the extent of the hazard was known and under control.

Con Edison made changes to its leak response procedure and cast iron replacement program. The cast iron replacement program was revised to incorporate the proximity to large subsurface structures. The leak response procedure was revised to include a requirement that "Based on upon the severity of the condition described by outside sources (e.g. Fire Department) or Company personnel, additional qualified personnel shall be dispatched by the Gas Emergency Response Center (GERC) to the reported location."

9.2 Sanford Avenue, Queens, NY; July 25, 2008

On July 25, 2008, a natural gas explosion occurred in a multifamily building located on Sanford Avenue in Flushing, New York.[29] A Con Edison distribution mechanic had been on location that same day to restore gas service to seven of the building's risers. Gas entered one of the apartments through an open appliance valve, resulting in serious injury to two of the residents, one of which later died from the injuries.

Prior to the accident, the FDNY had responded to an apartment fire on June 11, 2008 at which time a Class A[30] warning tag was issued and the gas turned off to the building. The building owner hired a licensed plumber to repair the internal gas piping[31] and the plumber had notified Con Edison that the plumbing was complete and ready for final testing and gas turn-on. According to the NYPSC report, the Con Edison gas distribution mechanics failed to perform their work in accordance with company procedures by not gassing-in any appliances on the riser with the open valve and had not stopped their work upon noticing that the actual piping conditions contradicted what was reported on the plumber's paperwork[32] to Con Edison.

As a result of the accident and investigation, Con Edison made changes to their 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.") to provide more thorough documentation and checks when restoring gas service to apartment buildings. Finally, Con Edison shareholders credited ratepayers $1.5 million as a result of the NYPSC investigation by its authority under Public Service Law §25.

9.3 Case 09-G-0380, Floral Park (Queens), NY; April, 2009

On April 24, 2009, at about 4:50 p.m., a natural gas explosion and fire at a private residence in Queens, New York[33]resulted in one person dying from injuries received in the accident and several other persons being injured. Con Edison personnel were near the

[29] 147-25 Sanford Avenue, Queens, NY; Safety Section Office of Electric, Gas & Water, issued April 2009

[30] Class A warning tag (as defined under NYCRR 261.57 indicates a leak that presents an immediate hazard.

[31] Refer to the section in this report on "Definition of Service Line." Under NY State regulations (part 255.3), Con Edison does not own and maintain gas service lines past the first fitting inside a building (upstream of the gas meter). These are the responsibility of the building owner.

[32] Plumbers are required to provide Con Edison an "Integrity Test Affidavit" prior to gas turn-on and warning tag removal.

[33] 80-50 260th Street Queens, New York

accident scene when the explosion occurred investigating a report of a gas odor in the area.

Con Edison was first notified of a partial electrical outage at 3:22 p.m. at a building next door to the accident scene. Two minutes later, Con Edison was notified of a gas odor from the same location. Following the notifications, a Con Edison mechanic was dispatched at 3:56 p.m. and arrived on-scene by 4:05 p.m. where he noted a strong smell of gas on the street. The mechanic began testing nearby sewer manholes where the readings were 20% gas. The mechanic also entered the home of the person that had made the two calls but found no indications of gas on the main floor or the basement. The mechanic returned outside and found additional sewer manholes with readings of 20% gas in air. Following the readings, the mechanic tested for gas along the curb (near an electrical service box) at the accident address and obtained three readings of 90% gas in air. A second Con Edison mechanic was dispatched to assist the first and arrived on scene by 4:42 p.m. The mechanics had opened the sewer manhole covers to vent gas and were verifying service records to identify which buildings were serviced by the boxes when the explosion happened. The Fire Department was on-scene almost immediately and nearby homes and buildings were evacuated.

The following day, further investigation revealed that the source of the leaking gas was from a hole in a 2-inch steel gas distribution main with an operating pressure of 53 psig. The hole was located near the service line connection for the home that exploded. Investigators located a metal conduit with electrical services for the exploded home that was in direct contact with the gas main. Evidence showed that the insulation was completely melted off and arcing had occurred between the conduit and gas main. The gas line was installed in 1950 and the electrical service in 1951; however, additional construction in 1987 (to install water and sewer mains) and 2000 (to rebuild the roadway) may have damaged the electrical conduit.

The NYPSC issued a Show Cause order under its Public Service Law §25 authority against Con Edison for a failure to follow the safety regulations which resulted in a settlement of one million dollars. As a result of this accident Con Edison revised its emergency response procedures and policies that included sending additional company crews to a scene and requesting the Fire Department through the Gas Emergency Response Center in situations where

- *“A report of strong outside odor of gas from company personnel, fire department, police department, emergency responders or school officials.*
- *A report of two or more gas leaks on the same block at approximately the same time.*
- *Reports of gas and electric problems at approximately the same time in close geographic proximity.*
- *Gas readings of 4% or greater are detected in a subsurface structure after venting, or the structure cannot be vented.*

- *Gas readings of 4% or greater are detected in two or more subsurface structures prior to venting."*

Con Edison's "Multiple Resource Response Event" (Code MuRRE) procedure[34], implemented in October 2009, sets forth a total of ten conditions (including those listed above) that trigger a request from Con Edison's Gas Emergency Response Center for a Fire Department response.

Con Edison implemented additional procedures for their Gas Emergency Response Center and the Fire Department. Some of the changes included:

- *"Company responders will evacuate buildings, including themselves, when gas readings in the general atmosphere cannot quickly be brought down below 0.5%.*
- *The fire department will be instructed to evacuate residents if an odor of gas or any instrument reading is obtained.*
- *In multi-family and large commercial buildings, the Con Edison responder and/or fire department may limit the evacuation to the affected area.*
- *Any outside gas reading within five feet of a building wall requires an inside investigation.*
- *The fire department's public address system or Con Edison megaphone will be used to assist with evacuations. The evacuation message will advise people to proceed to the next street."*

Lastly, Con Edison reported taking the following actions to address similar accidents that included:

- Revised communications in the Public Awareness bill inserts that tell customers steps to take when a gas leak is suspected. This was supplemented with subway and printed message campaign, "Smell Gas, Act Fast" which reinforced that the public should call Con Edison, and not to light matches, or use electrical devices.
- Conducted training and drills with the Gas Emergency Response Center, Con Edison first responders and the Fire Department.
- Increased staffing levels and adjusted the shift times to create an overlap for mechanics, and supervisory personnel on duty.
- *"Revised the call center emergency scripts to emphasize the potential hazard and provide more detailed information to the caller regarding vacating the premises immediately, telling others to do so also, getting away from the area of the suspected gas leak, waiting for the arrival of a trained mechanic, and avoiding creation of any sparks or ignition sources."*

[34] See - Multiple Resources Response Event (Code MuRRE) procedure.

10 Con Edison, 1974 NTSB Accident Report and Recommendations

The National Transportation Safety Board (NTSB) investigated a Con Edison accident in April of 1974 and issued a final report in 1976 with seven conclusions and five recommendations. The NTSB report, "Consolidated Edison Company Explosion at 305 East 45th Street New York, New York"[35] investigated the cause of an explosion that demolished portions of a 25-story commercial building in New York City. The cause of the explosion was attributed to the rupture of a pressurized tank, which broke a natural gas line located inside the building. Once the natural gas reached its lower explosive limit and found an ignition source it exploded and damaged the building.

In its report, the NTSB noted that Con Edison did not own or maintain the service line inside the building beyond the first valve. The owner of the piping beyond the valve had no records available to indicate how the piping was installed or tested. The report identified the dissimilarity between the 49 CFR 192 definition of service line and the definition under NYCRR part 255. In its findings, the NTSB stated, "The Federal regulation requiring pipeline operators to be responsible for the operation and maintenance of gas piping inside the buildings over which they have no control is unrealistic and impractical."[36] As a result of the finding, the NTSB issued a recommendation[37] to the Department of Transportation (DOT) to, "Amend 49 CFR 192 to define more realistically an operator's responsibility for gas piping inside buildings."

In response to the NTSB recommendation, the Research and Special Programs Administration (RSPA) issued an advanced notice of proposed rulemaking (ANPRM)[38] in 1980 that included 14 questions concerning the inclusion of the National Fuel Gas Code under the Federal regulations and seeking Operator input regarding the coverage of internal piping addressed under 49 CFR part 192.

The responses received from the ANPRM were further discussed at the Technical Pipeline Safety Standards Committee (TPSSC) in December of 1983 at which time the committee recommended that RSPA withdraw its proposed rulemaking regarding interior piping. RSPA issued a withdrawal of the proposed rulemaking in 1986.[39]

RSPA noted, in its ANPRM to withdraw the rulemaking, that there had been no similar accidents in the 12-years since the original accident and that New York was the only state with a disparity between State and Federal definitions of service lines. In addition, the ANPRM stated that New York had put in place more stringent rules to prevent accidents. RSPA cited a report done by Gas Research Institute (GRI No. 5081-352-0489) that

[35] National Transportation Safety Board "Consolidated Edison Company Explosion at 305 East 45th Street New York, New York; April 22, 1974; NTSB-PAR-76-2, issued April 19, 1976.
[36] Finding number 7 of the Conclusions; page 16
[37] Recommendation P-76-10 of PAR-76-2; Appendix A, Safety Recommendations P-76-9 through P-76-11; issued to the Honorable William T. Coleman Jr.; Secretary Department of Transportation
[38] PHMSA Docket No. PS-67; Notice 1, April 3, 1980, in Vol. 45, No. 66 at 22118
[39] PHMSA Docket No. PS-67; Notice 2, May 2, 1986, in Vol. 51, No. 85 at 16362

expressed the probability of a fatal accident occurring on interior pipe as being once every 18 years.

In their response to the NTSB, RSPA stated that the rationale for withdrawing the proposed rulemaking was, "the absence of problems caused by interior piping or by existing interior piping regulations combined with our belief that the operator's responsibility over this piping as defined in the regulations serves the public interest." The NTSB closed the recommendation as "Closed Reconsidered" in December of 1986 noting that a gap in the federal regulations remained with respect to the lack of protection afforded above ground service lines versus buried service lines.

11 NYPSC and Northeast Gas Association Gas Odor Response Guidelines

Following the gas explosion that occurred in Floral Park (Queens), NY in April of 2009; the NYDPS and Northeast Gas association began collaborating to develop best practices for operators when responding to leak and odor calls. On June 3, 2010, the Northeast Gas Association released the "NY State Leak and Odor Response Procedure Guidelines,"[40] which were voluntarily adopted by all New York operators. The purpose of the committee was to identify actions that should be part of an Operator's Leak Response procedure.

The goal was, *"to advance early awareness of conditions that might indicate a more serious hazard so as to respond quickly and with the appropriate company and non-company emergency responders. Additionally, the committee felt strongly that a company's procedures should provide guidance as to the sequence of steps that need to be taken early in a leak investigation to mitigate a serious hazard as quickly as possible."*

The committee reviewed four primary areas: odor response calls to the company call center, odor response calls at the dispatch center, and inside, and outside leak investigations.

- Odor response calls to company call center: The ad hoc committee recommended that this subject be examined under a dedicated working group with the objective of defining best practices. Subjects addressed would include Call Center scripts and the development of "Decision Trees" to minimize the time spent on the call and the ability to establish an adequate response level that would expedite the dispatch of company / non-company resources. The committee would develop criteria for determining whether the call was from a "reliable source" (a company employee, Company contractor employee, fire department, police department, and/or other emergency response personnel from a municipal agency, and a School or Hospital Official) and identify key words that can raise the sense of urgency.

- Odor Response Calls at Dispatch Center: The ad hoc group highlighted the importance of a company identifying triggers that will immediately dispatch additional

[40] Northeast Gas Association (NGA), NY State Leak and Odor Response Procedure Guidelines; June 3, 2010

company or outside agency response personnel. Examples cited included the report of a strong odor of gas by a reliable source at the scene, sustained general atmospheric readings in more than one building.

- Inside Investigation: in addition to identifying the need to quickly identify, isolate and ventilate a building, the committee suggested that all possible entries to a building be tested for gas and to evacuate the building if necessary. The committee also suggested that companies consider including triggers for when to initiate the dispatch of additional assistance including the Fire Department.

- Outside Investigation: when dealing with an outside leak investigation the committee stresses the importance of talking with the person that initiated the call to find out where the odor was first noticed and to investigate inside the building where the call had originated. Some of the triggers for notifying the Fire Department included high readings of 4% or greater gas found in two or more structures or company personnel that arrive on scene and identify strong atmospheric gas odors.

12 Attachments

1. NYPSC and NGA Leak Response Guidelines
2. 49CFR192 Incorporated by Reference_16NYC_RR
3. NFPA_54 Incorporated by Reference_16NYC_RR
4. Definition of service line_16NYC_RR
5. Definition of Service Line_CFR-2011-title49-vol3-part192
6. Piping Beyond the Meter_16NYC_RR-part 261
7. Plastic Pipe Pressure Test_CFR-2011-title49-vol3-part192
8. Pressure testing_16NYC_RR-255.507
9. Revise 16 NYCRR (CASE 14-G-0357)
10. USCODE-2009-title49-subtitleVIII-chap601-sec60105
11. 04_24_09_Floral Park_Queens Case 09-G-0380
12. 07_25_08_147-25 Sanford Avenue
13. 10-G-0100 Floral Park Settlement
14. 11_21_07_Sunny Side_Case 08-G-0415
15. Increased Leak Complaints - PSC Chair to Con Edison
16. Increased Leak Complaints - Con Edison to PSC
17. OQ - Fusion Issue - Con Edison response – supplemental
18. OQ - Fusion Issue - Con Edison response
19. OQ - Fusion Issue - PSC Letter to Con Ed
20. NYPSC letter to Con Edison regarding PA changes
21. Con Ed response to NYPSC regarding PA changes
22. 14-G-0212 - PSC Chair to Con Edison - Fusion Welding IR
23. Con Edison ressponse_1_Jul_2
24. Con Edison ressponse_1_Jul_7
25. CECONY 2010 Record Audit Response
26. CECONY 2011_Record audit_ Response
27. CECONY 2012 Record Audit _response_090712
28. CECONY 2013 record audit response
29. CENY 753 Citations 2008-2013
30. Con Edison Final 2013 Audit Reports

31. Manhattan Violations
32. NTSB Information Request #2 (list)
33. Violation Within Quarter Mile
34. NYSDPS IR 040314
35. Con Edison Code MuRRE Procedures
36. Con Edison_1974_NTSB_PAR-76-2
37. NTSB Corres In P-76-9 Thru 11
38. NTSB Corres Out P-76-9 Thru 11
39. Federal Register ANPRM_RSPA_NTSB Rec P-76-10_51 FR 16362
40. NYC Underground infrastructure_report