Missouri Public Service Commission

Staff's Investigation Report

In the Matter of an Investigation into Spire Missouri Inc., d/b/a Spire's Compliance with The Commission's Rules Regarding Natural Gas Safety Found at 20 CSR 4240-40.030

APPENDIX B

COPIES OF REFERENCE DOCUMENTS

Spire Missouri Inc., d/b/a Spire

Case No. GS-2022-0047

Industry Analysis Division
Safety Engineering Department
November 15, 2023 - Jefferson City, Missouri

- Instructions (rev 5-2021) for completing Form PHMSA F 7100.1-1 (rev 5-2021)

- Notice to Gas and Hazardous Liquid Pipeline, Underground Natural Gas Storage and Liquefied Natural Gas Facility Operators and PHMSA State Partners Regarding the National Emergency Relating to the Novel Coronavirus Disease (Covid-19) Outbreak

- National Transportation Safety Board Pipeline Accident Brief UGI Utilities Natural Gas-Fueled Explosion Millersville, Pennsylvania July 2, 2017

Instructions (rev 5-2021) for completing Form PHMSA F 7100.1-1 (rev 5-2021)
ANNUAL REPORT FOR CALENDAR YEAR 20_____
GAS DISTRIBUTION SYSTEM

Editorial corrections to ONLINE REPORTING METHOD made on 3/3/2022 and shown as redlines below.

All section references are to Title 49 of the Code of Federal Regulations. Reporting requirements are contained in Part 191, "Transportation of Natural and Other Gas by Pipeline; Annual Reports, Incident Reports and Safety Related Condition Reports." Except as provided in §191.11(b), each operator of a gas distribution pipeline (see definitions below) must submit an annual report Form PHMSA F 7100.1-1 for the preceding calendar year not later than **March 15th**. Be sure to report TOTAL miles of main pipeline and services in the system at the end of the reporting year, including additions to the system during the year. The annual reporting period is on a calendar year basis ending on December 31st of each year.

If you need copies of the Form PHMSA F 7100.1-1 and/or instructions, they can be found on http://www.phmsa.dot.gov/pipeline/library/forms. The documents are included in the section titled Accident/Incident/Annual Reporting Forms.

ONLINE SUBMISSION IS REQUIRED UNLESS AN ALTERNATIVE REPORTING METHOD IS GRANTED BY PHMSA

ALTERNATE REPORTING METHOD

If electronic reporting imposes an undue burden and hardship, an operator may submit a written request for an alternative reporting method to the Information Resources Manager, Office of Pipeline Safety, Pipeline and Hazardous Materials Safety Administration, PHP-20, 1200 New Jersey Avenue, SE Washington DC 20590. The request must describe the undue burden and hardship. PHMSA will review the request and may authorize, in writing, an alternative reporting method. An authorization will state the period for which it is valid, which may be indefinite. An operator must contact PHMSA at 202-366-8075, or electronically to informationresourcesmanager@dot.gov or make arrangements for submitting a report that is due after a request for alternative reporting is submitted but before an authorization or denial is received.

ONLINE REPORTING METHOD

Annual Reports must be submitted online through the PHMSA Portal at https://portal.phmsa.dot.gov/portal, unless an alternate method is approved (see Alternate Reporting Methods below).

You will not be able to submit reports until you have met all of the Portal registration requirements – see
https://portal.phmsa.dot.gov/PHMSAPortal2/staticContentRedesign/howto/PortalAccountCreation.pdf
~~http://opsweb.phmsa.dot.gov/portal_message/PHMSA_Portal_Registration.pdf~~
Completing these registration requirements could take several weeks. Plan ahead and register well in advance of the report due date.

Use the following procedure for online reporting:

1. Go to the PHMSA Portal at https://portal.phmsa.dot.gov/portal

2. Enter PHMSA Portal Username and Password ; press *enter*
3. Select OPID; press "*continue"* button.

4. Under "**Create Reports**" on the left side of the screen, under *Annual* select "Gas Distribution" and proceed with entering your data. *Note: Data fields marked with a single asterisk are considered required fields that must be completed before the system will accept your initial submission.* Also, only one annual report by commodity for an OPID may be submitted per year.

5. To save intermediate work without formally submitting it to PHMSA, click **Save**. To modify a draft of an annual report that you saved, go to **Saved Reports** and click on *Gas Distribution*. Locate your saved report by the date, report year, or commodity. Select the record by clicking on it once, and then click **Modify** above the record.

6. Once all sections of the form have been completed, click on **Validate** to ensure all required fields have been completed and data meets all other requirements. A list of errors will be generated that must be fixed prior to submitting an Annual Report.

7. Click **Submit** when you have completed the Report (for either an Initial Report or a Supplemental Report), and are ready to initiate formal submission of your Report to PHMSA.

8. A confirmation message will appear that confirms a record has been successfully submitted. To save or print a copy of your submission, go to **Submitted Reports** on the left hand side, and click on *Gas Distribution*. Locate your submitted report by the date, report year, or Commodity Group, and then click on the PDF icon to either open the file and print it, or save an electronic copy.

9. To submit a *Supplemental Report*, go to **Submitted Reports** on the left hand side, and click on *Gas Distribution*. Locate your submitted report by the date, report year, or Commodity Group. Select the record by clicking on it once, and then click "Create Supplemental".

GENERAL INSTRUCTIONS

The following definitions are from § 192.3:

1. "Distribution line" means a pipeline other than a gathering or transmission line.

2. "Gathering line" means a pipeline that transports gas from a current production facility to a transmission line or main.

3. "Transmission line" means a pipeline, other than a gathering line, that:

a. Transports gas from a gathering line or storage facility to a distribution center, storage facility, or large volume customer that is not downstream from a distribution center;
b. Operates at a hoop stress of 20 percent or more of SMYS; or
c. Transports gas within a storage field. A large volume customer may receive similar volumes of gas as a distribution center, and includes factories, power plants, and institutional users of gas.

4. "Operator" means a person who engages in the transportation of gas.

Make an entry in each block for which data are available. Estimate data if necessary. Avoid entering any data in the **UNKNOWN** columns, if possible. Some companies may have very old pipe for which installation records do not exist. Estimate the total of such mileage in the **UNKNOWN** column of Part B, item 2 "Miles of Main in System at End of Year" and item 3 "Number of Services in System at End of Year", and item 4 "Miles of Main and Number of Services by Decade of Installation."

Do not report miles of pipe, pipe segments, or pipeline in feet. When main miles and service counts for the same set of pipelines is reported in different parts of the form, the online system will require the different parts to be consistent. Main miles and service counts over 60 must be within 0.5% of the baseline and values under 60 must be within 0.3 miles for main and service counts must match exactly. Part B4, decade of installation, will serve as the baseline for main miles and service counts. For example, if you report 60 miles of main in Part B4, the miles of main in Parts B1 and B2 must be within 0.3 miles of 60. For main miles, use the number of decimal places needed to satisfy these consistency checks. Service counts may only be entered as positive integers.

For a given OPID, a separate Annual Report is required for each Commodity Group within that OPID. As an example, if an operator uses a single OPID and has one set of pipeline facilities transporting natural gas and another transporting landfill gas, this operator must file two Annual Reports – one Annual Report covering natural gas facilities and a second for the landfill gas facilities. When a pipeline facility transports two or more Commodity Groups, the pipeline facility should be reported only once under the predominantly transported Commodity Group.

PART A – OPERATOR INFORMATION

1. Name of Operator

This is the company name associated with the OPID. For online entries, the name will be automatically populated based on the OPID entered in A3. If the name that appears is not correct, you need to submit an Operator Name Change (Type A) Notification.

2. Location of Office Where Additional Information May Be Obtained

Enter the appropriate address.

3. Operator's 5-digit Identification Number (OPID)

For online entries, the OPID will automatically populate based on the selection you made when entering

the Portal. If you have log-in credentials for multiple OPID, be sure the report is being created for the appropriate OPID. Contact PHMSA's Operator Hotline at 202-366-8075 if you need assistance with an OPID.

4. Headquarters Name and Address

This is the headquarters address associated with the OPID. For online entries, the address will automatically populate based on the OPID entered in A3. If the address that appears is not correct, you need to change it in the online Contacts module.

5. State of Operation

Enter the **State for which information is being reported. Submit a separate report for each State** in which the company operates a gas distribution pipeline system.

6. Commodity Group

It is a PHMSA requirement that operators submit separate Reports for each Commodity Group within a particular OPID.

File a separate Annual Report for each of the following Commodity Group**s**:

Natural Gas

Synthetic Gas (such as manufactured gas based on naphtha)

Hydrogen Gas

Propane Gas

Landfill Gas (includes biogas)

Other Gas – If this Commodity Group is selected, report the name of the other gas in the space provided.

Note: When a pipeline facility transports two or more of the above Commodity Groups, the pipeline facility should be reported only once under the predominantly transported Commodity Group. For example, if an operator has a pipeline segment that is used to transport natural gas during the majority of the year and propane for a couple of weeks, that operator should only file an annual report for the natural gas. If an operator has two pipeline segments with one pipeline segment used to transport natural gas and the other pipeline segment transporting hydrogen gas, that operator should file two annual reports - 1 report for natural gas and 1 report for hydrogen gas.

7. Operator Type

Enter the Type of Operator based on the structure of the company included in this OPID for which this report is being submitted. "Investor Owned" means the operator is controlled by a corporation with

publicly traded stock. "Municipally Owned" means the operator is controlled by any type of State or local government entity including, county, parish, utility district, or municipality. "Privately Owned" means the operator is controlled by a corporation without publicly traded stock. All other operators should report "Cooperative."

PART B – SYSTEM DESCRIPTION

"Coated" means pipe coated with any effective hot or cold applied dielectric coating or wrapper.

"Reconditioned Cast Iron" means cast iron gas distribution pipe that has been lined internally by use of suitable materials that ensure safe operation at an MAOP not to exceed the previously established MAOP. "Reconditioned Cast Iron" does not include cast iron pipe inserted with a gas pipe that is, by itself, suitable for gas service under Part 192, e.g., an ASTM D2513 pipe meeting code requirements for the intended gas service. Such insertions shall be reported as the material used in the insertion. The intent of the definition is to make a clear distinction between a liner and inserted pipe. An example of "Reconditioned Cast Iron" would be the insertion of a liner inside cast iron pipe where the liner relies on the structural integrity of the cast iron pipe. For details on liner insertion, see ASTM F2207, Standard Specification for Cured-in-Place Pipe Lining System for Rehabilitation of Metallic Gas Pipe. Methods of installation like pipe-splitting or bursting that involve the installation of a new stand-alone pipe while the host pipe is destroyed does not result in "Reconditioned Cast Iron".

"PVC" means polyvinyl chloride plastic.

"PE" means polyethylene plastic.

"ABS" means acrylonitrile-butadiene-styrene plastic.

"Cathodically protected" applies to both "bare" and "coated."

"Other" means a pipe of any material not specifically designated on the form. If you enter miles of main or services in the "other" category, describe these materials in the appropriate text box.

"Number of service" is the number of service lines, not the number of customers served.

Provide miles of main and numbers of services by decade installed in Part B, section 4.

If you do not know the decade of installation of the pipe because there are no records containing such information, enter an estimate in the UNKNOWN column. The sum total of mileage and number of services reported for Part B, section 4 must be consistent with total mileage and number of services reported in sections 1, 2, and 3 in Part B.

PART C – TOTAL LEAKS AND HAZARDOUS LEAKS ELIMINATED/REPAIRED DURING YEAR

In the appropriate column, include the total number of leaks and the number of hazardous leaks eliminated by repair, replacement or other action during the reporting year. The number of "hazardous

leaks" eliminated or repaired during the year is reported as a performance measure for integrity management per § 192.1007(g). When reporting leaks or hazardous leaks eliminated by replacing or abandoning a segment of pipe, count the leaks that existed in the pipe segment before it was replaced or abandoned. Also include leaks and hazardous leaks reported on form PHMSA 7100.1, "Incident Report Gas Distribution Systems." A reportable incident is one described in § 191.3. Do not include leaks that occurred during testing.

A "leak" is defined as an unintentional escape of gas from the pipeline. Do NOT report a leak determined to be non-hazardous and eliminated by lubrication, adjustment, or tightening.

A "hazardous leak" means a leak that represents an existing or probable hazard to persons or property and requires immediate repair or continuous action until the conditions are no longer hazardous. A "hazardous leak" which occurs aboveground or belowground is a leak and must be reported.

Operators who do not grade leaks for hazard, but rather repair all leaks when found, need not grade repaired leaks solely for the purpose of this report. Such operators treat all leaks as if hazardous. Operators who do not grade leaks must report the same values for both total and hazardous leaks for each cause.

The "number of known system leaks at the end of the year scheduled for repair" is the total number pipeline system leaks being monitored and scheduled for repair at the end of the calendar year. Monitored leaks also include those leaks which have been temporarily repaired until a permanent repair can be performed. These leaks are non-hazardous unless reclassified following the operator's operation and maintenance procedures.

Enter the number of hazardous leaks by any cause involving a mechanical joint failure during the calendar year. "Mechanical joint" means a connection of two sections of pipe using one of the following types of fittings: stab, nut follower, bolted, or other compression type. The first three types are further described below:

Stab - Internally there are specially designed components including an elastomer seal, such as an "O" ring, and a gripping device to affect pressure sealing and pull-out resistance capabilities. Self-contained stiffeners are included in this type of fitting. With this style fitting the operator would have to prepare the pipe ends, mark the stab depth on the pipe, and "stab" the pipe in to the depth prescribed for the fitting being used.

Nut Follower – The components are generally a body; a threaded compression nut or a follower; an elastomer seal ring; a stiffener or an integrated stiffener for plastic pipe; and, with some, a gripping ring. Normally the design concept of this type of fitting typically includes an elastomer seal in the assembly. The seal, when compressed by tightening of a threaded compression nut grips the outside of the pipe, affecting a pressure-tight seal and, in some designs, providing pull-out resistance. For plastic pipe, the inside of the pipe wall should be supported by the stiffener under the seal ring and under the gripping ring (if incorporated in the design), to prevent collapse of the pipe. A lack of this support could result in a loss of the seal affected by the seal ring or the gripping of the pipe for pull-out resistance. This fitting style is normally used in pipelines 2-inches in diameter and smaller. There are

two categories of this type of joining device manufactured. One type is provides a seal only, and the other provides a seal plus pipe restraint against pull-out.

Bolted – The bolt type mechanical fitting has similar components as the nut follower except instead of a threaded compression nut or follower, there is a bolt arrangement. This fitting style is most often used in pipelines 2-inches in diameter and larger.

Leak causes are classified as:

CORROSION FAILURE: leak caused by galvanic, atmospheric, stray current, microbiological, or other corrosive action. A corrosion release or failure is not limited to a hole in the pipe or other piece of equipment. If the bonnet or packing gland on a valve or flange on piping deteriorates or becomes loose and leaks due to corrosion and failure of bolts, it is classified as Corrosion. (Note: If the bonnet, packing, or other gasket has deteriorated to failure, whether before or after the end of its expected life, but not due to corrosive action, report it under a different cause category, such as G4 Incorrect Operation for improper installation or G6 Equipment Failure if the gasket failed)

NATURAL FORCE DAMAGE: leak caused by outside forces attributable to causes NOT involving humans, such as earth movement, earthquakes, landslides, subsidence, heavy rains/floods, lightning, temperature, thermal stress, frozen components, high winds (Including damage caused by impact from objects blown by wind), or other similar natural causes. Lightning includes both damage and/or fire caused by a direct lighting strike and damage and/or fire as a secondary effect from a lightning strike in the area. An example of such a secondary effect would be a forest fire started by lightning that results in damage to a gas distribution system asset which results in an incident.

EXCAVATION DAMAGE: leak resulting directly from excavation damage by operator's personnel (oftentimes referred to as “first party” excavation damage) or by the operator’s contractor (oftentimes referred to as “second party” excavation damage) or by people or contractors not associated with the operator (oftentimes referred to as “third party” excavation damage). Also, this section includes a release or failure determined to have resulted from previous damage due to excavation activity. For damage from outside forces OTHER than excavation which results in a release, use Natural Force Damage or Other Outside Force, as appropriate.

OTHER OUTSIDE FORCE DAMAGE: leak resulting from outside force damage, other than excavation damage or natural forces such as:

- Nearby Industrial, Man-made or Other Fire/Explosion as Primary Cause of Incident (unless the fire was caused by natural forces, in which case the leak should be classified Natural Forces. Forest fires that are caused by human activity and result in a release should be reported as Other Outside Force),
- Damage by Car, Truck, or Other Motorized Vehicle/Equipment NOT Engaged in Excavation. Other motorized vehicles/equipment includes tractors, mowers, backhoes, bulldozers and other tracked vehicles, and heavy equipment that can move. Leaks resulting from vehicular traffic loading or other contact (except report as “Excavation Damage” if the activity involved digging, drilling, boring, grading, cultivation or similar activities.

- Damage by Boats, Barges, Drilling Rigs, or Other Maritime Equipment or Vessels so long as those activities are not excavation activities. If those activities are excavation activities such as dredging or bank stabilization or renewal, the leak repair should be reported as "Excavation Damage".
- Previous Mechanical Damage NOT Related to Excavation. A leak caused by damage that occurred at some time prior to the release that was apparently NOT related to excavation activities, and would include prior outside force damage of an unknown nature, prior natural force damage, prior damage from other outside forces, and any other previous mechanical damage other than that which was apparently related to prior excavation. Leaks resulting from previous damage sustained during construction, installation, or fabrication of the pipe, weld, or joint from which the release eventually occurred are to be reported under "Pipe, Weld, or Joint Failure". Leaks resulting from previous damage sustained as a result of excavation activities should be reported under "Excavation Damage" unless due to corrosion in which case it should be reported as a corrosion leak.
- Intentional Damage/. Vandalism means willful or malicious destruction of the operator's pipeline facility or equipment. This category would include pranks, systematic damage inflicted to harass the operator, motor vehicle damage that was inflicted intentionally, and a variety of other intentional acts.
- Terrorism, per 28 C.F.R. § 0.85 General functions, includes the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.
- Theft. Theft means damage by any individual or entity, by any mechanism, specifically to steal, or attempt to steal, the transported gas or pipeline equipment.

PIPE, WELD, OR JOINT FAILURE : Leak resulting from a material defect within the pipe, component or joint due to faulty manufacturing procedures, desing defects, or in-service stresses such as vibration, fatigue and environmental cracking. Material defect means an inherent flaw in the material or weld that occurred in the manufacture or at a point prior to construction, fabrication or installation. Design defect means an aspect inherent in a component to which a subsequent failure has been attributed that is not associated with errors in installation, i.e., is not a construction defect. This could include, for example, errors in engineering design. Fitting means a device, usually metal, for joining lengths of pipe into various piping systems. It includes couplings, ells, tees, crosses, reducers, unions, caps and plugs. Any leak that is associated with a component or process that joins pipe such as threaded connections, flanges, mechanical couplings, welds, and pipe fusions that leak as a result from poor construction should be classified as "Incorrect Operation". Leaks resulting from failure of original sound material from force applied during construction that caused a dent, gouge, excessive stress, or other defect, including leaks due to faulty wrinkle bends, faulty field welds, and damage sustained in transportation to the construction or fabrication site that eventually resulted in a leak, should be reported as "Pipe, Weld or Joint Failure".

EQUIPMENT FAILURE: leak caused by malfunctions of control and relief equipment including regulators, valves, meters, compressors, or other instrumentation or functional equipment, Failures may be from threaded components, Flanges, collars, couplings and broken or cracked components, or from O- Ring failures, Gasket failures, seal failures, and failures in packing or similar leaks. Leaks caused by overpressurization resulting from malfunction of control or alarm device; relief valve malfunction: and valves failing to open or close on command; or valves which opened or closed when not commanded to do so. If overpressurization or some other aspect of this incident was caused by incorrect operation, the incident should be reported under "Incorrect Operation."

INCORRECT OPERATION: leak resulting from inadequate procedures or safety practices, or failure to follow correct procedures, or other operator error. It includes leaks due to improper valve selection or operation, inadvertent overpressurization, or improper selection or installation of equipment. It includes a leak resulting from the unintentional ignition of the transported gas during a welding or maintenance activity.

OTHER CAUSE: leak resulting from any other cause not attributable to the above causes. A best effort should be made to assign a specific leak cause before choosing the Other cause category. An operator replacing a bare steel pipeline with a history of external corrosion leaks without visual observation of the actual leak, may form a hypothesis based on available information that the leak was caused by external corrosion and assign the Corrosion cause category to the leak.

PART D – EXCAVATION DAMAGE

Excavation damages are reported as a measure of the effectiveness of integrity management programs (§ 192.1007(g)).

Report the "Number of Excavation Damages" experienced during the calendar year by the following apparent root cause which are classified as:

One-Call Notification Practices Not Sufficient: Damages resulting from no notification made to the One-Call Center; or notification to one-call center made, but not sufficient; or wrong information provided to One Call Center.

Locating Practices Not Sufficient: Damages resulting from facility could not be found or located; or facility marking or location not sufficient; or facility was not located or marked; or incorrect facility records/maps.

Excavation Practices Not Sufficient: Damages resulting from failure to maintain marks; or failure to support exposed facilities; or failure to use hand tools where required; or failure to test-hole (pot-hole); or improper backfilling practices; or failure to maintain clearance; or other insufficient excavation practices.

Other: Damages resulting from One-Call Center error; or abandoned facility; or deteriorated facility; or previous damage or data not collected; or other.

The Total Number of Excavation Damages will be calculated automatically based on the data entered. For this purpose, "Excavation Damage" means any impact that results in the need to repair or replace an underground facility due to a weakening, or the partial or complete destruction, of the facility, including, but not limited to, the protective coating, plastic pipe tracer wire, lateral support, cathodic protection or the housing for the line device or facility.

Report also the "Number of Excavation Tickets" received during the year, (i.e., receipt of information by the operator from the notification center).

PART E – EXCESS FLOW VALVE (EFV) AND SERVICE VALVE DATA

Report the number of EFV and manual service line shut-off valves installed during the calendar year. Report the estimated total number of EFV and manual service line shut-off valves in the system at the end of the calendar reporting year. Be sure to include the number installed during the calendar year when reporting the estimated number in the system at the end of the calendar year.

PART F – TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED/ELIMINATED OR SCHEDULED FOR REPAIR

Federal Lands: As defined in 30 U.S.C. §185, federal lands means "all lands owned by the United States except lands in the National Park System, lands held in trust for an Indian or Indian tribe, and lands on the Outer Continental Shelf." Indicate only those leaks repaired, eliminated, or scheduled for repair during the reporting year, including those incidents reported on Form PHMSA F 7100.1.

PART G – PERCENT OF UNACCOUNTED FOR GAS

"Unaccounted for gas" is gas lost; that is, gas that the operator cannot account for as usage or through appropriate adjustment. Adjustments are appropriately made for such factors as variations in temperature, pressure, meter-reading cycles, or heat content; calculable losses from construction, purging, line breaks, etc., where specific data are available to allow reasonable calculation or estimate; or other similar factors.

State the amount of unaccounted for gas as a percent of total consumption for the 12 months ending June 30 of the reporting year.

[(Purchased gas + produced gas) minus (customer use + company use + appropriate adjustments)] divided by (customer use + company use + appropriate adjustments) times 100 equals percent unaccounted for.

PART H – ADDITIONAL INFORMATION

Include any additional information which will assist in clarifying or classifying the reported data.

PART I - PREPARER

PREPARER is the name of the person most knowledgeable about the report or the person to be contacted for more information. Please include the direct phone number and email address as applicable (e-mail address is desired but not required). It should be noted that PHMSA will use your e-mail address to issue correspondence that is normally sent via mass mailings. "Correspondence" includes notifications such as the annual reminder letter for Annual Report filings.

NOTICE TO GAS AND HAZARDOUS LIQUID PIPELINE, UNDERGROUND NATURAL GAS STORAGE AND LIQUEFIED NATURAL GAS FACILITY OPERATORS AND PHMSA STATE PARTNERS REGARDING THE NATIONAL EMERGENCY RELATING TO THE NOVEL CORONAVIRUS DISEASE (COVID-19) OUTBREAK

RE: Notice of Stay of Enforcement and Notice of Enforcement Discretion to Operators Affected by the Coronavirus (COVID-19) Outbreak

In light of the March 13, 2020, the President's Declaration of a National Emergency (National Emergency) Relating to the Novel Coronavirus Disease (COVID-19) Outbreak, the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety, recognizes that operators (including hazardous liquid and gas pipeline, underground natural gas storage and liquefied natural gas operators) impacted by recent events may be faced with resource constraints due to COVID-19. Limited personnel resources and the ongoing need to meet operational and maintenance needs may necessitate actions by personnel that may not fully meet federal operator qualification (OQ), control room management (CRM), and employment drug testing requirements.

Federal regulations in Title 49 Code of Federal Regulations (C.F.R.) Subpart N of Part 192, Subpart H of Part 193, and Subpart G of Part 195, require operators to ensure, through evaluation or training, that each worker performing operation or maintenance activities is either qualified under the operator's written OQ program or has demonstrated capability to perform assigned functions. Sections 192.631(d)(4) and 195.446(d)(4) and (h) of the regulation also require operators with controllers working in control rooms to implement programs to establish and follow certain hours-of-service and to conduct specialized training programs for pipeline controllers. Furthermore, Part 199 of the regulation requires pre-employment and random drug testing for workers who perform certain activities known as "covered functions." See 49 C.F.R. § 199.105(a) and (c).

PHMSA understands that some pipeline operators are finding it extremely difficult to meet one or more of these regulatory requirements because of personnel and resource constraints due to the National Emergency and have sought temporary relief as they develop strategies and alternatives for maintaining normal operations and protecting the health and safety of their personnel and the public.

This Notice advises operators affected by the National Emergency that PHMSA does not intend to take any enforcement action with regard to OQ and CRM requirements, and will consider exercising its enforcement discretion with regard to Part 199 drug testing requirements. PHMSA is taking into consideration the exigent circumstances that may drive operators regulated by PHMSA to be unable able to comply with the following: (1) OQ requirements found in 49 C.F.R. §§ 192.801-192.809, 193.2707-2709, 193.2713-2717, and 195.501-195.509; and (2) control room requirements found in 49 C.F.R. §§ 192.631(d)(4) and 195.446(d)(4) and (h) due to COVID-19.

Operators are encouraged to fully use the flexibilities already afforded by part 199 regarding pre-employment and random drug testing. Operators are permitted under the part 199 regulations to schedule the date, time, and location of the pre-employment drug test. Moreover, the regulations allow for random drug testing to be spread reasonably throughout the calendar year. PHMSA will consider using its enforcement discretion with regard to requirements found in 49 C.F.R. § 199.105(a) and (c). Operators who are unable to comply with these regulations should maintain documentation explaining what specific requirements are not being met, how the non-compliance is related to COVID-19, and what alternative measures are being taken to ensure safety. Operators should also communicate with their regulator as indicated in this notice.

In addition to these three specific areas, PHMSA realizes there may be other regulatory requirements under the Federal pipeline safety laws in 49 C.F.R. Parts 190 through 199 that pose compliance challenges for operators during this National Emergency. In such cases, it is important that operators adequately document any such issues and communicate promptly with their regulator about them. PHMSA will exercise discretion in its overall enforcement of other parts of the pipeline safety regulations with the intent of providing operators with the flexibility to maintain normal operations while ensuring public safety and protection of the environment.

For intrastate operators regulated by State authorities, PHMSA will not object to waivers, special permits, stays of enforcement or similar measures granted by State authorities to pipeline operators for noncompliance due to COVID-19 with State regulations equivalent to the Federal regulations.

Operators who determine that they cannot comply with the regulations described in this Notice because of challenges due to COVID-19 should promptly notify the following:

- For operators Regulated by PHMSA: Please contact PHMSA's Office of Pipeline Safety by email at Pipeline-COVID-19-notices@dot.gov; and
- For Intrastate operators Regulated by State Authorities: Please contact your State Program Manager – State Program Manager contacts available at: http://www.napsr.org/state-program-managers.html.

This Notice is effective on March 20, 2020, and will remain in effect until further notice or modification by the Associate Administrator for Pipeline Safety, PHMSA. Nothing in this Notice prohibits PHMSA from rescinding this stay of enforcement or enforcing the regulations outline above if it determines that a significant safety issue or other circumstance warrants doing so.

Please be advised that this Notice applies only to operators faced with limited resources as a result of the impacts of the National Emergency and does not relieve them from complying with any other applicable provisions of the Federal pipeline safety regulations and acting reasonably to use trained, non-impaired workers to perform operations, maintenance and control-room tasks. Furthermore, pipeline operators subject to this Notice remain fully responsible for the safe operation of their systems and maintaining the capability to detect and respond to critical pipeline safety issues and adequately respond to pipeline emergencies.

ISSUED THIS 20th DAY OF MARCH, 2020, IN WASHINGTON, D.C.

Alan K. Mayberry
Associate Administrator for Pipeline Safety

National Transportation Safety Board

Pipeline Accident Brief

UGI Utilities Natural Gas-Fueled Explosion

Millersville, Pennsylvania

July 2, 2017

The Accident

On July 2, 2017, at 12:32 p.m. eastern daylight time, a natural gas-fueled explosion occurred at a single-family residence at 206 Springdale Lane, Millersville, Pennsylvania.[1] The explosion killed one person and injured three others, destroyed the residence and significantly damaged six neighboring homes, one of which was subsequently condemned.[2] (See figure 1.)

Figure 1. Debris field at cul-de-sac area where explosion occurred.

At 10:26 a.m., a neighborhood resident walking in the area smelled natural gas and reported it to the local gas utility, UGI Utilities, Inc. (UGI).[3] About half an hour later, a UGI service

[1] All times in this accident brief are eastern daylight time.

[2] Local authorities condemned the residence at 202 Springdale Lane.

[3] On June 1, 1882, UGI is incorporated in Philadelphia as the United Gas Improvement Company, becoming the first public utility holding company in the United States. In February 1968, the company changed its name to UGI Corporation.

technician arrived to investigate and confirm the gas leak.[4] An additional UGI technician and a senior supervisor arrived shortly thereafter. A Lancaster Area Sewer Authority (LASA) employee arrived on scene in response to UGI's Emergency PA (Pennsylvania) One Call to mark the location of the sewer lines.[5] About 15 minutes prior to the explosion, UGI personnel directed the resident of 206 Springdale Lane to evacuate the residence who left in their personal automobile. About 12:15 p.m., UGI requested fire department support. The first fire truck arrived at 12:28 p.m. and assumed a stand-by position. The house exploded about 4 minutes later.

Following the accident, the natural gas main and service pipelines for the cul-de-sac homes were leak tested. All segments held pressure, except for the service line at the 206 Springdale Lane connection at the main; this segment had a Permalock mechanical tapping tee.[6] Subsequent inspection of the Permalock mechanical tee revealed gas was leaking at the connection of the tee to the 2-inch main, and two of the four nylon bolts had fractured. At the time of the accident, the operating pressure of the line was 54 pounds per square inch, gauge (psig), as measured at the closest monitoring point that was about 0.5 mile away from 206 Springdale Lane.

The Pipeline System

The natural gas main on Springdale Lane was made from a polyethylene material that was installed on August 7, 1995. The maximum allowable operating pressure (MAOP) of the system main serving Springdale Lane was 60 psig.

The service line to the 206 Springdale Lane residence was installed in June 1998, and was constructed of 1/2-inch polyethylene pipe. The mechanical tapping tee was installed at the same time as the service line. The mechanical tapping tee and service pipe had been in service for 19 years when the accident occurred.[7] The pipe between the main and the meter at the residence was 50 feet long. The service line to the residence was inserted inside a 1-inch polyethylene pipe that served as a protective jacket. The jacket ran from the outlet of the service tee to the meter.

UGI Actions Following the Gas Leak Report

Shortly after the gas leak report, UGI dispatched a UGI technician to respond. At 11:00 a.m., the technician arrived on scene and was the first UGI representative on site. He began his assessment to determine the presence of a leak. Consistent with UGI policy and training, the technician began implementing UGI's leak survey procedure. His investigation determined that the leak source was at an adjacent residence, which was 206 Springdale Lane.

At 11:18 a.m., the technician called the on-call UGI senior supervisor of Operations Construction and Maintenance (senior supervisor). The technician requested a response crew because he measured high-gas-concentration readings and confirmed a leak. The technician told

[4] UGI refers to its service technicians as mechanics. Each mechanic has a "grade" designation of I, II, or III, which is determined by the degree of qualifications and experience.

[5] For additonal information, see http://www.pa1call.org/PA811/Public/.

[6] The *Honeywell Elster Perfection PermaLock Mechanical Tapping Tee* is a tee that can be installed on a main to supply the individual gas service to a gas customer without the need to shut down the natural gas main.

[7] UGI *Gas Operations Manual*, section 70.20.

the senior supervisor that he suspected that a mechanical tee was leaking, and that he measured a reading of 80 percent gas in the sewer and 98 percent gas over the tee. Based on the gas readings, the technician classified the leak as an emergency leak. The senior supervisor contacted UGI Dispatch at 11:20 a.m. and requested that they call Emergency PA One Call to mark underground utilities because an excavation would be necessary. The Emergency PA One Call ticket was issued at 11:27 a.m.

About 11:20 a.m., the senior supervisor began assembling a crew to respond to the leak. Using the UGI duty roster of employees available to respond to emergencies, the senior supervisor made several calls between 11:25 a.m. and 11:44 a.m. to the on-call duty operator, who is required to answer all calls for response during off hours, including weekends; however, that duty operator did not respond. The senior supervisor contacted the next duty operator appearing on the on-call list, who answered and responded to the scene. By 11:50 a.m., the senior supervisor had assembled a three-person crew at the site.

After assembling a response crew, the senior supervisor traveled to the scene. The senior supervisor told National Transportation Safety Board (NTSB) investigators that prior to arriving on-scene he reviewed the location of the closest shutoff valve to the site. On his way to the shutoff valve, he contacted the UGI engineer and informed her that he expected to shut down a main line. As the duty supervisor, the senior supervisor could exercise judgement to determine whether it was appropriate to either squeeze off the line or close a gas valve.[8] After the discussion with other responding UGI employees, the senior supervisor decided to squeeze off the main line rather than closing the mainline valve, because he thought this action was the fastest way of stopping the flow of gas. Figure 2 shows the location of the valve.

Figure 2. Location of gas shut-off valve in relation to accident site.

[8] To *squeeze off a line* is a method of controlling either the pressure or the flow through a plastic pipe by reducing its cross-sectional area by applying an external force.

The senior supervisor told NTSB investigators that the following factors influenced his decision to squeeze off the main: he considered that given the circumstances surrounding the leak, even if the valve were turned off, the gas would continue to flow to the leak until the system lost pressure; and the line could be quickly and successfully excavated and squeezed, as compared to the time necessary to reach the valve.

The senior supervisor stated that he received a phone call from the technician, who said that he had measured a lower explosive limit (LEL) of 11 percent in the basement at 202 Springdale Lane and that he could not gain access to the house at 206 Springdale Lane.[9] The senior supervisor informed the technician that he should do whatever was necessary, including a forced entry, to clear the house at 206 Springdale Lane.

Shortly after noon, the senior supervisor arrived at the scene and continued making calls from his vehicle to his management and others to keep them abreast of the situation. Within 10 minutes of arriving, the senior supervisor made an assessment that the fire department was needed. At 12:14 p.m., he called UGI Dispatch to request that they call 9-1-1, which was accomplished 1 minute later. The technician arrived at the scene at 12:19 p.m.

The senior supervisor and the duty operator began excavating the gas main pipeline. While the excavation was underway, the technician reported that he was measuring 20 percent LEL at the stoop on 206 Springdale Lane and that he had trouble getting the occupant to respond to his knocking at the front door. The technician had twice visited the residence to the left of the accident home (202 Springdale Lane) and had talked with the residents. The LEL measurement on the first visit was 10 percent. Returning 30 minutes later, he advised the residents that there was no need to evacuate as the LEL measurement was at 11 percent, which is less than UGI's 20 percent LEL threshold for resident evacuation.

While the main line was being excavated, the occupant of 206 Springdale Lane responded to the technician. Based on the gas percentage reading of 20 percent LEL in the home, the technician decided to evacuate the home. The occupant requested permission to leave in her personal vehicle that was stored in the garage. Although the technician did not allow the occupant to use her powered garage door opener, he allowed the occupant to start her vehicle in the garage and depart the area. The electrical power to the neighborhood remained energized at the time of the accident.[10]

The technician was near the gas meter for 206 Springdale Lane when the explosion occurred. The two gas employees, who were digging at the main in front of the home, had fully excavated the plastic main and were ready to squeeze-off the plastic main line when the explosion occurred. The representative from LASA was walking in the cul-de-sac when the explosion occurred. The technician located near the gas meter was killed, and three others were injured.

[9] *Lower explosive limit* (LEL) is the minimum concentration of vapor (percentage by volume) in air below which propagation of a flame does not occur in the presence of an ignition source.

[10] At 12:59 p.m., the UGI Dispatch contacted the local electric power provider, PPL Electric Utilities (PPL), and requested that they shut off the power to the area. At 1:08 p.m., PPL confirmed that the electric power was shut off and that its personnel were on site.

Technician Experience and Qualifications

The technician, who was killed in the explosion, had over 16 years of utility experience. In 2001, he started working at UGI. He was a technician in the Construction and Maintenance department. Since April 2003, he held an Investigating Leak and Odor Complaints qualification. He held 73 operator qualification tasks that covered all aspects of gas utility work, including emergency response, pipe joining, repair and maintenance, and inspection activities. Since 2013, he had responded to and resolved 446 emergency calls. Of those 446 calls, 238 were gas leaks. Of those 238 leaks, 27 were hazardous underground gas leaks.

Mechanical Tapping Tees

NTSB's examination of the tee assembly involved in the accident revealed the assembly was incorrectly installed because a locking sleeve, an important piece of hardware that served as an attachment between the tee and the main, was not attached to the main. The tee is also secured to the main by four nylon bolts. Although four nylon bolts were installed, two of them were fractured. Since the locking sleeve was not attached to the main, additional tensile stress was placed on the four nylon bolts, which then become the fail-safe feature holding the tee assembly in place. The NTSB determined two of the four nylon bolts fractured when in service in a manner consistent with slow crack growth. The incorrect installation of the tee, combined with the in-service fracture of the two nylon bolts, allowed gas to escape from the tee assembly. See Safety Recommendation Report PSR-18/01 *Installation of PermaLock Mechanical Tapping Tee Assemblies*, including Safety Recommendations P-18-001 through -004, for details pertaining to examination and testing of tee assemblies.

Postaccident Actions

UGI took the events of July 2, 2017, as an opportunity to reinforce and enhance the procedures and programs specifically revolving around emergency response to ensure employee preparedness, competence, and confidence when responding to emergency situations. The following summarizes the emergency response improvements UGI implemented across departments and job functions:

1. System Improvement Initiatives

Immediately following the accident, UGI instituted the following initiatives to manage the integrity of the system on Springdale Lane from the intersection of Burr Oak Drive west to the end of the cul-de-sac. UGI implemented the following improvements:

- Conducted a daily driving leak survey of the main in the neighborhood
- Remediated or replaced all known mechanical tees
- Replaced the entire gas main

- Took actions to manage the integrity of the surrounding neighborhood defined by the boundaries of North Duke Street, Blue Rock Road, Letort Road, and Little Conestoga Creek

2. Pipeline and Public Safety Improvements

The UGI Pipeline and Public Safety department undertook several training initiatives to emphasize the incident command system. Outreach efforts with external emergency response departments was increased to strengthen the awareness of natural gas pipeline safety.

3. Training and Field Compliance Improvements

UGI updated its training to improve the skill set of its employees when responding to an emergency.

4. Pipeline Facility Improvements

UGI implemented pipeline facility enhancement to ensure the safe and reliable delivery of natural gas to its customers. This enhancement included the increased remediation activity of mechanical tees throughout its distribution system, by either remediating or replacing 2,577 total mechanical tees since the accident [through October 4, 2018]. UGI continues to examine the main and service facilities to determine the mechanical tees that must be replaced.

5. Dispatch Improvements

UGI modified its dispatch procedures and protocols. UGI streamlined dispatch processes to proactively identify the need for electrical shutdown and additional help.

6. Standard and Procedure Improvements

UGI created an emergency plan that is separate from its Gas Operations Manual (GOM). UGI's emergency plan contains similar content as previously included in GOM 60.50– Emergency Plan; however, the procedures have been revised to add further clarity to the emergency response situations and the actions undertaken.

7. 9-1-1-Related UGI Initiatives

To enhance safety and to ensure 9-1-1 emergency responders are timely notified, UGI:

- Developed a first-hour checklist for first responders that provides guidance on when to (1) contact the local emergency response agencies: 9-1-1 and Emergency Medical Services, (2) shut off electrical power in the area, and (3) conduct an evacuation
- Updated its response procedures to include "safety perimeter" criteria
- Reinforced the discretion that UGI's first responders must shut down a pipeline

- Created checklists for leak investigations
- Identified in its emergency response procedures specific emergency situations where immediate 9-1-1 notification is required by UGI personnel
- Reviewed and updated its dispatch procedures to include a decision matrix
- Identified situations and keywords where immediate 9-1-1 notification is required

8. Safety Culture Assessment Project

In June 2018, UGI contracted DuPont Sustainable Solutions (DSS) to assess the UGI safety culture and the efficacy of UGI safety-related initiatives and incident investigation process to create a unified safety brand. The assessment included a comprehensive evaluation that provided a baseline to understand the current state and the development of an improvement strategy to advance the culture, systems, and processes as part of a world-class safety program.

Pennsylvania Public Utility Commission Enforcement Action

On October 4, 2018, the Pennsylvania Public Utility Commission Bureau of Investigation and Enforcement, issued a formal complaint against UGI that proposed a cumulative civil penalty of $2,090,022. This complaint, which was an enforcement action of that regulatory agency, alleged several safety violations that occurred during the gas leak response on Springdale Lane.

Previously Issued Safety Recommendations

As a result of this natural gas-fueled explosion on June 25, 2018, the NTSB issued the following four safety recommendations:

To the Pipeline and Hazardous Materials Safety Administration:

> Work with state pipeline regulators to incorporate into inspection programs, a review to ensure that gas distribution pipeline operators are using best practices recommended by the manufacturer in its distribution integrity management programs, including using the specified tools and methods, to correctly install Permalock mechanical tapping tee assemblies. (P-18-001)
>
> Safety Recommendation P-18-001 is classified *Open—Initial Response Received.*
>
> Reference the use of external sources of information for threat identification in your frequently asked questions for preparation of distribution integrity management programs. (P-18-002)
>
> Safety Recommendation P-18-002 is classified *Closed-Acceptable Action.*

To Honeywell International, Incorporated:

Update your Permalock mechanical tapping tee assembly installation instructions to specify the exact tools that should be used during installation and explain what an installer should sense while using those tools throughout the installation process. (P-18-003)

Safety Recommendation P-18-003 is classified *Open—Initial Response Received.*

Specify in your Permalock mechanical tapping tee assembly installation instructions a not-to-exceed torque limit for Nylon bolts and have that value checked and adjusted with a torque wrench immediately after installation. (P-18-004)

Safety recommendation P-18-004 is classified *Open—Initial Response Received.*

Probable Cause

The National Transportation Safety Board determines that the probable cause of the natural gas explosion at 206 Springdale Lane was an improperly installed mechanical tapping tee that leaked and allowed gas to migrate into the house where it ignited.

For more details about this accident, visit www.ntsb.gov/investigations/dms.html and search for NTSB accident identification number DCA17FP006.

Issued: February 25, 2019

The NTSB has authority to investigate and establish the facts, circumstances, and cause or probable cause of a pipeline accident in which there is a fatality or substantial property damage, or significant injury to the environment. (49 U.S. Code, Section 1131 - *General authority*)

The NTSB does not assign fault or blame for an accident or incident: rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties…and are not conducted for the purpose of determining the rights or liabilities of any person." Title 49 *Code of Federal Regulations*, Section 831.4. Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report. 49 U.S. Code, Section 1154(b).
