Missouri Public Service Commission

Staff's Incident Report

3 Millers Ct.
O'Fallon, Missouri
March 1, 2022 Gas Incident

Spire Missouri Inc.
(Formerly known as "Laclede Gas Company")
and
Gateway Infrastructure, LLC

Industry Analysis Division
Safety Engineering Department

April 24, 2023 - Jefferson City, Missouri

** Denotes Confidential Information **

STAFF'S INCIDENT REPORT

3 Millers Ct.
O'Fallon, Missouri
March 1, 2022 Gas Incident

Table of Contents

Appendices:

STAFF'S INCIDENT REPORT

3 Millers Ct.
O'Fallon, Missouri
March 1, 2022 Gas Incident

I. EXECUTIVE SUMMARY

On March 1, 2022, JDK Cable General Contractors ("The Excavator") was boring ** [redacted] ** on the North side of Millers Court in O'Fallon, Missouri on behalf of Gateway Infrastructure, LLC[1] ("Gateway"). The Excavator had requested marking of buried utility facility locations through Missouri 811.[2] The locations of the natural gas facilities in the area of planned excavation had been marked prior to the incident.

Natural gas is provided in this area by Spire Missouri Inc. ("Spire"). The intended path of the bore head was parallel to Spire's 2-inch diameter plastic natural gas distribution main, and crossing several natural gas service lines. The Excavator had physically verified the locations of the service lines in the intended path of excavation prior to boring, but had not exposed the location of the natural gas main.

At approximately 10:30 a.m., the bore head struck the natural gas main at a location approximately 200 feet in front of the residence located at 3 Millers Ct. The Excavator reported the damage to 911 and Spire. The O'Fallon Fire Protection Division (FPD) and Spire dispatched crews to the scene. These crews worked to check for gas migration and to evacuate residents. Concurrent efforts were begun by Spire to stop the flow of gas to the main. Additional details regarding the emergency response efforts are provided in *Section III.A, Incident Description and Emergency Response*, and *Confidential Appendix A, Facts Reviewed by Utilities* of this report.

Natural gas escaping from the damaged 2-inch diameter PE gas main exited at a pressure of approximately 40 psig. Since natural gas is lighter than air[3], it will tend to migrate along paths of least resistance through the soil and upward into the atmosphere. The Excavator had not exposed the main at this location, so there was not a direct path for gas to escape from

[1] Gateway Infrastructure, LLC is the company name registered with Missouri Public Service Commission to provide VoIP phone service. Staff learned during its investigation that Gateway Infrastructure, LLC has been doing business in Missouri as Gateway Fiber. Gateway Fiber is the Company name that JDK Cable General Contractors used to identify Gateway Infrastructure, LLC when it requested utilities to be located for this project. The company has recently been informed of the need to comply with Commission rule 20 CSR 4240-28.011(2) so that the company's name reflects the d/b/a name.
[2] Missouri-811 refers to the Missouri One Call System.
[3] Natural gas has a specific gravity of approximately 0.6 while air has a specific gravity of 1.0.

the location of damage to the atmosphere. The natural gas migrated through the soil and into the basement of the residence located at 3 Millers Ct. The exact route the gas followed is unknown. Natural gas migrating to and along the foundation could have entered the structure through any cracks or utility entrance holes. At approximately 11:25 a.m., Spire obtained a reading of 1% gas-in-air[4] inside the 3 Millers Ct. residence and the occupant was evacuated. Details regarding additional structures in which gas was detected and occupants evacuated are provided in Section III.A and Confidential Appendix A of this report.

At approximately 11:54 a.m., the residence at 3 Millers Ct. exploded and subsequently caught fire. There were no injuries or fatalities reported as a result of this incident. Property damages included the residences at 3 Millers Ct., 5 Millers Ct. and 1528 Parsons Bend Court. Spire estimated that the property damage from the incident is $663,761 property and contents. At approximately 11:54 a.m., the area was made gas safe. By 4:45 p.m., gas had been restored to the system.

A. Violations of Statutes Rules or Orders

As a result of its investigation, Staff found that sufficient facts and information[5] exist to assert the following violations:

Spire:

None

Gateway:

1. Failure to maintain at least 12-inches of separation between communications facilities and gas lines was a violation of 20 CSR 4240-18.010.

[4] Natural gas is composed mostly of methane. The lower explosive limit (LEL) for methane is 5% gas-in-air by volume, therefore a 1% gas in air reading indicates that the amount of gas in air is at approximately 20% of the LEL.
** [redacted] **

[5] Prior to finalizing this report, Staff provided a copy of the factual basis for its analysis to Spire and Gateway respectively to provide an opportunity to correct any factual inaccuracies and to identify confidential content. A copy of information edited as directed by Spire and Gateway respectively is provided in Confidential Appendix A.

2. Failure of a contractor working on behalf of Gateway to confirm the horizontal and vertical location of the natural gas main in the vicinity of the excavation was a violation of Section 319.037.2. RSMo.[6]

B. Staff Recommendations for Areas Needing Improvement

Staff also asserts that sufficient facts and information exist to recommend various areas of improvement in an effort to minimize the possibility of recurrence of the events that caused or contributed to this incident. Section V of this report contains Staff's recommendations.

II. PURPOSE AND SCOPE OF STAFF'S INVESTIGATION

The purpose and scope of Staff's investigation was to:

- Identify the probable cause(s) of the incident;
- Investigate, analyze and determine if there have been violations of Commission pipeline safety rules related to:
  - Incident Reporting Requirements in 20 CSR 4240-40.020; and
  - Missouri Pipeline Safety Standards in 20 CSR 4240-40.030, including but not limited to the operator's emergency response;
- Investigate, analyze and determine if Spire has complied with the July 31, 2007, Commission Order in Case No. GS-2007-0130, requiring compliance with the Staff recommendation as specified in Staff's pleading filed on June 20, 2007;
- Investigate, analyze and determine if there have been violations of Commission Rule 20 CSR 4240-18.010 prescribing minimum safety standards relating to the operation of electric utilities, telecommunication companies and rural electric cooperatives, and
- Make recommendations, as applicable to Spire and Gateway with an objective of minimizing the possibility of recurrence.

[6] ** [redacted] **

III. STAFF ANALYSIS OF INCIDENT

A. Incident Description and Emergency Response

On March 1, 2022, the Excavator was boring on the North side of Millers Court from a bore rig located in front of 7 Millers Ct.[7] The intended path of the bore head was east to west, parallel to a 2-inch diameter plastic natural gas distribution main, and crossing three natural gas service lines. The Excavator had verified the locations of the service lines by "potholing[8]" prior to boring. The bore head had advanced from the bore rig approximately 200 feet east to a location in front of 3 Millers Ct. when it struck the natural gas main.[9] The Excavator had not verified the location of the natural gas main at this location by potholing. Figures 1 and 2 in Appendix B show the incident location.

The damage was to a 2-inch diameter polyethylene (PE) natural gas main, operating at approximately 40 psig at the point and time of the damage.[10] Confidential Figure 3 in Appendix B shows the location of damage to the pipeline.

At 10:37 a.m., the Excavator reported the damage to Spire. At 10:38 a.m., the Excavator called Missouri 811 to report the damage (Ticket No. 220601729).

At 10:42 a.m., Spire dispatched a first crew, which arrived on the scene at 10:59 a.m. to coordinate with the O'Fallon FPD, and to check for gas migration.

Spire dispatched its second crew, a Leak Truck Foreman and a Leak Truck Worker to 3 Millers Ct. at 11:01 a.m. Spire then dispatched a Supervisor of Maintenance at 11:08 a.m. The Spire Leak Truck Foreman and Leak Truck Worker arrived on-site at 11:18 a.m. Meanwhile, a Spire General Fitting Service technician established a restricted zone. The

[7] Staff visited the site on March 2, 2022 and observed the locations of the bore rig.

[8] Section 319.037 RSMo uses the term "potholing" to refer to the practice of exposing an underground facility to determine its specific location, but does not define the term. The Common Ground Alliance (CGA) Best Practices Guide refers to a "pothole" as a "test hole" and provides the following definition:

> **Test Hole:** Exposure of a facility by safe excavation practices used to ascertain the precise horizontal and vertical position of underground lines or facilities.

[9] Staff observed the location of the bore rig on the North side of Millers Court, the potholes exposing service lines and the location of the damaged main in front of 3 Millers Ct. The location of the damage is also shown Confidential in Figure 3 of Appendix B.

[10] Based on Spire's Federal Incident Report submitted in accordance with 20 CSR 4240-40.020(6).

Leak Truck Foreman began assessing shut down options and the Leak Truck Worker began air jacking[11] the affected area.

At 11:23 a.m. Spire called in an emergency locate request (Ticket No. 220602061) and began digging to expose the main in front of 4 Millers Ct. At 11:25 a.m. Spire obtained a reading of 1% gas-in-air[12] inside the 3 Millers Ct. residence. Spire personnel turned off the gas to 3 Millers Ct. and obtained a 0% gas-in-air reading in the sanitary sewer at 5 Millers Ct. No one was home at 5 Millers Ct.; the occupant at 3 Millers Ct. was evacuated.

At 11:30 a.m., Spire obtained a reading of 2% gas-in-air in the 1516 Parsons Bend Ct. residence to the west of 3 Millers Ct. (*See* Appendix B, Figure 2), and expanded the restricted zone. Spire personnel turned off the gas to 1516 Parsons Bend Ct. and found no one home at 1508 Parsons Bend Ct. Spire personnel performed another check of the sanitary sewer at 5 Millers Ct. and confirmed the previous 0% gas-in-air reading.

At 11:35 a.m., Spire personnel began work to stop the flow of gas to the main. The main was exposed at approximately 11:37 a.m.

At 11:54 a.m., the residence at 3 Millers Ct. exploded and subsequently caught fire. Spire completed a squeeze off[13] of the main at 11:55 a.m. Spire obtained a reading of 0% gas-in-air inside the residence at 1528 Parsons Bend Ct., and subsequently began turning off gas to nearby homes on Millers Court, and checking for gas migration in additional homes on Millers Court and Parsons Bend Ct. At 12:00 p.m., the residence at 5 Millers Ct. caught fire.

Spire reported the incident to the National Response Center (Report No. 1329957) at 12:33 p.m., and MO PSC Staff at 12:47 p.m. Figures 4 and 5 in Appendix B show the

[11] "Air-jacking" is a term Spire uses to describe the procedure of forced ventilation of the subsurface atmosphere. The purpose of the "air-jack" is to eject a volume of air out of a subsurface area that is to be ventilated. To draw natural gas from a subsurface area, a pipe connected to an air compressor is inserted into a subsurface opening (e.g., bar-hole, excavation, man-hole, confined space) and the air flow creates a venturi-effect in the pipe that results in a vacuum in the soil or space to be ventilated. This accelerates the removal of natural gas from the soil or space to be ventilated.

[12] Natural gas is composed mostly of methane. The lower explosive limit (LEL) for methane is 5% gas-in-air by volume, therefore a 1% gas in air reading indicates that the amount of gas in air is at approximately 20% of the LEL. ** [redacted] **

[13] A squeeze-off of pipe utilizes a clamping tool to constrict the pipe so that natural gas can no longer freely flow past the tool.

property damage at 3 Millers Ct. following the incident. Figures 6 and 7 in Appendix B shows the property damages to adjacent homes following the incident.

At 11:55 a.m., Spire made the scene gas safe by squeezing the main. At 4:45 p.m., the damaged 2-inch plastic main was replaced, and gas was reintroduced.

At 8:32 p.m. Spire had restored gas service to 18 homes, 2 homes were condemned and the gas to 1 home was left off.

Table 1 presents a summary of the timeline of events.

TABLE 1: SUMMARY OF EVENTS

Time	Activity
10:37 AM	Spire notified of excavation damage
10:38 AM	O'Fallon FPD dispatched units for report of gas leak outside of residence
10:38 AM	Excavator Notified MO One-Call (Ticket No. 220601729)
10:42 AM	Spire dispatches first crew
10:45 AM	O'Fallon FPD arrives on scene
10:59 AM	Spire's first crew arrives on scene, begins to check for gas migration
11:01 AM	Spire leak crew is dispatched
11:18 AM	Restricted Zone established, Spire leak crew arrives on scene
11:23 AM	Emergency locates called in
11:25 AM	Evacuations begin
11:30 AM	Restricted Zone expanded
11:37 AM	Spire begins the squeeze off process
11:54 AM	Explosion and fire at residence at 3 Millers Ct
11:55 AM	Main squeezed off
12:00 PM	Residence at 5 Millers Ct caught fire
4:45 PM	Services lines to 3 and 5 Millers Ct. abandoned, main repaired and gas reintroduced to main
7:45 PM	Fire rekindled at 3 Millers Ct., O'Fallon FPD arrives to extinguish
8:32 PM	Spire completes 18 relights, 2 homes condemned

No deaths or injuries were reported as a result of this incident. Property damages included three residences, the damaged homes were 3 and 5 Millers Ct. and 1528 Parsons Bend Court. Spire estimated that the property damage from the incident is $663,761 property and contents, not including the estimated cost of natural gas loss.

The natural gas escaping from the damaged 2-inch diameter PE gas main exited at a pressure of approximately 40 psig. Since natural gas is lighter than air[14], it will tend to migrate along paths of least resistance through the soil and upward into the atmosphere. Because the Excavator had not exposed the main at this location, the natural gas migrated through the soil and into the basement of the residence located at 3 Millers Ct. The exact route the gas followed is unknown. Natural gas migrating to and along the foundation could have entered the structure through any cracks or utility entrance holes.

Natural gas entering the structure accumulated to an explosive mixture, and was ignited. The ignition source is unknown.

1. Requirements for Responding to Pipeline Emergencies

The Commission's Safety Standards – Transportation of Gas by Pipeline in 20 CSR 4240-40.030, require that each operator shall establish written procedures to minimize the hazard resulting from a gas pipeline emergency.[15] At a minimum, the procedures must provide for:

A. Receiving, identifying, and classifying notices of events which require immediate response by the operator;

B. Establishing and maintaining adequate means of communication with appropriate fire, police, and other public officials;

C. Responding promptly and effectively to a notice of each type of emergency, including the following:

(I) Gas detected inside or near a building;

(II) Fire located near or directly involving a pipeline facility;

[14] Natural gas has a specific gravity of approximately 0.6 while air has a specific gravity of 1.0.
[15] The requirements for Emergency Plans are in 20 CSR 4240-40.030(12)(J). 20 CSR 4240-40.030(12)(J)1. lists the minimum requirements for the written plan.

(III) Explosion occurring near or directly involving a pipeline facility; and

(IV) Natural disaster;

D. Making available personnel, equipment, tools, and materials, as needed at the scene of an emergency;

E. Taking actions directed toward protecting people first and then property;

F. Causing an emergency shutdown and pressure reduction in any section of the operator's pipeline system necessary to minimize hazards to life or property;

G. Making safe any actual or potential hazard to life or property;

H. Notifying appropriate fire, police, and other public officials of gas pipeline emergencies and coordinating with them both planned responses and actual responses during an emergency;

I. Safely restoring any service outage;

J. Beginning action under subsection (12)(L), if applicable, as soon after the end of the emergency as possible; and

K. Actions required to be taken by a controller during an emergency in accordance with subsection (12)(T).

2. <u>Spire's Actions to Comply with Rule Requirements</u>

Spire provided a copy of its applicable emergency procedure, *Emergency Plan Standard Operating Procedure (SOP)*, Document number 220.D.4 to Staff on March 24, 2022.

Spire's actions to comply with the Commission's requirements in 20 CSR 4240-40.030(12)(J) were as follows:

A. Within minutes of receiving notification of the damage, Spire dispatched its first crew to assess the scene, coordinate with emergency responders, and begin checking for gas migration;

B. The written accounts from Spire, the O'Fallon FPD and the O'Fallon police indicate that throughout the events leading up to and following this incident Spire maintained adequate communications with appropriate responders and public officials;

C. In coordination with the emergency responders, Spire took appropriate actions to monitor for gas migration inside of nearby buildings and to evacuate residents;

D. Spire made appropriate personnel, equipment and tools available to respond to the emergency;

E. In coordination with the emergency responders, Spire took appropriate actions to protect people first, then property;

F. By taking actions to squeeze off the main, Spire took actions to minimize hazards and restore safety; and

G. Following the incident, Spire took actions to restore the service outage.

3. Staff Analysis

Staff reviewed Spire's *Emergency Plan Standard Operating Procedure (SOP)*, Document number 220.D.3 and found that it satisfied the requirements of 20 CSR 4240.40.030(12)(J)1 for written emergency procedures.

Additionally, Staff found that Spire's emergency response actions were consistent with the requirements of its written emergency procedures, and Commission's rules.

4. Violations

Staff did not find violations of Commission rules with respect to Spire's emergency response.

5. Staff Recommendations

Staff does not have any recommendations with respect to Spire's emergency response.

B. Pipeline Damage and Incident Reporting

There are reporting requirements for excavators damaging a natural gas pipeline, as well as requirements of the natural gas pipeline operator to report a natural gas incident. Each of these are discussed below.

1. Reporting Requirements

a. Reporting the Pipeline Damage

Missouri Revised Statute Section 319.026.8. RSMo requires that in the event of any damage, dislocation, or disturbance of any underground facility in connection with any

excavation, the person responsible for the excavation operations shall notify the notification center[16]. The excavator shall immediately contact 911 when any damage or contact with a pipeline results in a release from the pipeline of hazardous liquid or gas to occur.

b. Reporting the Natural Gas Incident

Initial telephonic incidents are required to be made within 1 hour of confirmed discovery to the National Response Center (NRC), and within 2 hours to the Commission Staff. A telephonic revision or confirmation is required to the NRC within 48 hours, and a 30-day incident report is required. Detailed requirements of each are provided below.

ii. Initial – Telephonic Notifications

20 CSR 4240-40.020(3)(A) requires that at the earliest practicable moment following discovery, but no later than one (1) hour after confirmed discovery,[17] each operator shall give notice, in accordance with subsection (3)(B), of each federal incident as defined in section (2).

20 CSR 4240-40.020(3)(B) requires that each notice required by subsection (3)(A) must be made to the NRC.

20 CSR 4240-40.020(4)(A) requires operators to notify designated Commission personnel by telephone within two hours following discovery of a Missouri reportable incident[18] by the operator, or as soon thereafter as practicable if emergency efforts to protect life and property would be hindered.

[16] Section 319.026.8. RSMo additionally states that his subsection shall be deemed to require reporting of any damage, dislocation, or disturbance to trace wires, encasements, cathode protection, permanent above-ground stakes, or other such items utilized for protection of the underground facility.

[17] 20 CSR 4240-40.020(2)(C) (defining "confirmed discovery" to mean when it can be reasonably determined, based on information available to the operator at the time a reportable event has occurred, even if only based on a preliminary evaluation.).

[18] 20 CSR 4240-40.020(4)(A) (requiring reporting of the following events within areas served by the operator:

1. An event that involves a release of gas involving the operator's actions or pipeline system, or where there is a suspicion by the operator that the event may involve a release of gas involving the operator's actions or pipeline system, and results in one (1) or more of the following consequences: A. A death; B. A personal injury involving medical care administered in an emergency room or health care facility, whether inpatient or outpatient, beyond initial treatment and prompt release after evaluation by a health care professional; or C. Estimated property damage of ten thousand dollars ($10,000) or more, including loss to the gas operator or others, or both, and including the cost of gas lost; or
2. An event that is significant, in the judgment of the operator, even though it did not meet the criteria of paragraph (4)(A)1.).

iii. 48-Hour Revision or Confirmation

20 CSR 4240-40.020(3)(C) requires that within forty-eight (48) hours after the confirmed discovery of an incident, to the extent practicable, an operator must revise or confirm its initial telephonic notice required in subsection (3)(B) with an estimate of the amount of gas released, an estimate of the number of fatalities and injuries, and all other significant facts that are known by the operator that are relevant to the cause of the incident or extent of the damages. If there are no changes or revisions to the initial report, the operator must confirm the estimates in its initial report.

iv. 30-Day Incident Report

20 CSR 4240-40.020(6) requires that operators of distribution pipeline systems must submit U.S. Department of Transportation Form PHMSA[19] F 7100.1 as soon as practicable but not more than 30 days after detection of an incident required to be reported under section (3).

2. Actions to Comply with Reporting Requirements

a. Excavator

The Missouri 811's ticket status system[20] shows that on March 1, 2022 at 10:38 a.m., Mario Franco of JDK Cable General Contractors working on behalf of Gateway Fiber called to report a dig-up of a gas line, and that gas was blowing at 3 Millers Ct. in O'Fallon, Missouri.[21] The Excavator also notified 911 and Spire of the damage.

Spire provided a Confidential document, identifying the excavator as ** [redacted] **

b. Spire

- Spire's first notification to the NRC was on March 1, 2022 at 12:33 p.m. CST[22]
- Spire first notified Commission Staff telephonically of the incident at approximately 12:47 p.m. on March 1, 2022, stating that the incident occurred at around noon.

[19] Pipeline and Hazardous Materials Safety Administration (PHMSA)
[20] Ticket Search & Status is available publically at iSite (occinc.com).
[21] Missouri 811 Ticket No 220601729.
[22] NRC Incident Report No. 1329957, taken by NRC on 01-MAR-22 at 13:33 ET.

- Spire's second notification to the NRC was on March 3, 2022 at 1:38 p.m. CST.[23]
- Spire's incident report was submitted to PHMSA on March 31, 2022.[24]

3. Staff Analysis

a. Excavator

Following the damage to the pipeline, the actions of the Excavator were consistent with the requirements of the applicable reporting requirements. The Excavator notified 911 and Missouri 811 of the damage.

b. Spire

i. Initial – Telephonic Notifications

The pipeline damage was reported by Spire to have occurred at approximately 10:24 a.m. on March 1, 2022. Spire further reported that and that the Excavator notified Spire of the damage at 10:37 a.m. The initial notification by the Excavator at 10:39 a.m. to Missouri 811 reported "Gas is blowing"[25], which would not necessarily have been a clear indication that a reportable incident had occurred.[26] Spire personnel reported arriving on site at 10:59 a.m., at which time they coordinated with the O'Fallon Fire Department already on scene, and began checking for gas migration. Spire reported that at 11:54 a.m., 3 Millers Ct. exploded and subsequently caught fire. Staff therefore believes that by 11:54 a.m., there was sufficient evidence for Spire to have confirmed discovery that a reportable incident had occurred.

Spire's first notification to the NRC was at 12:33 p.m. on March 1, 2022, which is within one hour of confirmed discovery as required by 20 CSR 4240-40.020(3)(A).

Spire's first notification to MO PSC Staff was at approximately 12:47 p.m. on March 1, 2022, which is within two hours following discovery as required by 20 CSR 4240-40.020(4)(A).

ii. 48-Hour Revision or Confirmation

Spire's second notification to the NRC was on March 3, 2022 at 1:38 p.m., which was approximately 49.7 hours following confirmed discovery. Spire did not provide notification

[23] NRC Incident Report No. 1330159, taken by NRC on 03-MAR-22 at 14:38 ET.
[24] PHMSA No 20220025-36533.
[25] Missouri 811 Ticket No. 220601729.
[26] Reporting criteria are provided in 20 CSR 4240-40.020(3), (4), and (5).

to the NRC within 48 hours, however Staff notes that 20 CSR 4240-40.020(3)(C) provides "… to the extent practicable". Staff recognizes that when an event is classified as an incident due to cost and/or gas release volume estimates, it may take some time to gather the information and either confirm or revise to the NRC.

Following Staff's investigation of a July 1, 2020 gas incident in Kansas City, Staff recommended that Spire review, evaluate and update, as necessary, its reporting procedures to ensure that such procedures require revision or confirmation of its initial telephonic notice to the NRC within 48 hours after confirmed discovery of an incident as required by 20 CSR 4240-40.020(3)(C).[27] As part of a Stipulation and Agreement the Commission approved in Case No. GC-2022-0087, Spire amended its Spire Missouri Inc. Operations Procedure Manual (OPM) to include the 48 hour telephonic update to the NRC within 48 hours after confirmed discovery of an incident as required by 20 CSR 4240-40.020(3)(C).

iii. 30-Day Incident Report

Spire provided its initial incident report to PHMSA within 30 days.

4. Violations

Staff did not find violations regarding excavator reporting.

Staff found that Spire's actions were consistent with the requirements of 20 CSR 4240-40.020(3), (4), and (6), however Staff included one recommendation below as a result of its investigation related to more timely reporting to the NRC.

5. Staff Recommendations

Staff recommends that Spire review its incident reporting procedures and actions with respect to completion of the 48-hour telephonic notice in the March 1, 2022, incident to determine how reporting times may be improved going forward.

[27] See Staff's Gas Incident Report, US Route 169 and Northwest Barry Road, Kansas City, Missouri, July 1, 2020 Gas Incident, Commission Case No. GS-2021-0019, file date June 30, 2021.

C. Spire's Damage Prevention Program

1. Damage Prevention Program Requirements

Commission Rule 20 CSR 4240-40.030(12)(I)1. requires each operator of buried pipelines to have and carry out a written program to prevent pipeline damage by excavation activities in accordance with subsection 20 CSR 4240-40.030(12)(I)1.

Section 319.030 RSMo of the "Underground Facility Safety and Damage Prevention Act" requires that every person owning or operating an underground facility to whom notice of intent to excavate is required to be given, upon receipt of such notice as provided in this section from a person intending to commence an excavation, inform the excavator as promptly as practical, but not in excess of two working days, unless the excavator agrees to extend the start date and time provided in the locate request through methods established by the notification center, of the approximate location[28] of underground facilities in or near the area of the excavation so as to enable the person engaged in the excavation work to locate the facilities in advance of and during the excavation work, provided that no excavation shall begin earlier than the scheduled excavation date provided on the locate request unless the excavator has confirmed that all underground facilities have been located. The utility owner or operator shall provide the approximate location of its underground facilities by the use of markings as designated in Section 319.015 RSMo.

2. Spire Actions to Comply with 20 CSR 4240-40.030(12)(I)

Spire provided a copy of its *Damage Prevention Program Standard Operating Procedure (SOP)*, Document number 220.C.3.

A notification of intent to excavate on Millers Court was received from Missouri 811. Spire's locate contractor provided locate markings on the ground surface above the Spire facilities along Miller Court on February 23, 2022. The locate markings on the ground surface above the natural gas main at the damage location were within the "approximate location" as required by Section 319.030 RSMo.

[28] 319.015. Definitions. — For the purposes of sections 319.010 to 319.050, the following terms mean:
(1) "Approximate location", a strip of land not wider than the width of the underground facility plus two feet on either side thereof. In situations where reinforced concrete, multiplicity of adjacent facilities or other unusual specified conditions interfere with location attempts, the owner or operator shall designate to the best of his or her ability an approximate location of greater width;

Spire identified "high-profile areas" (HPAs)[29] on its pipeline system and used a ticket management system to screen locate requests and determine when a locate request conflicts with an HPA. Conflicts are e-mailed to Spire's civic improvement inspectors to evaluate the need for and extent of excavation inspection. The excavation along Millers Court did not conflict with an HPA and Spire did not conduct an excavation inspection prior to the incident.

3. Staff Analysis

Staff reviewed Spire's *Damage Prevention Program Standard Operating Procedure (SOP)*, Document number 220.C.4 and found that it met the minimum requirements of 20 CSR 4240.40.030(12)(I)1. Additionally, Staff found that Spire's actions were consistent with the requirements of its written *Damage Prevention Program Standard Operating Procedure (SOP)*, Document number 220.C.4, and with Commission's rules.

4. Violations

Staff did not find evidence that Spire violated Commission rules with respect to damage prevention.

5. Staff Recommendations

None.

D. Terms of Commission Order from Case No. GS-2007-0130

1. Order Requirements

Case No. GS-2007-0130 concerned a natural gas incident at Premio Lane in Fenton, Missouri. An excavation contractor damaged a Laclede Gas Company[30] pipe while drilling horizontally to install an electric utility cable for AmerenUE, causing a natural gas leak and explosion[31]. In an order issued on July 31, 2007, the Commission ordered that:

[29] Staff asked what was Spire's definition of a HPA on March 1, 2022, and Spire's response stated: The Company's definition of a HPA is the area 25-feet in each direction of mains of cast or bare steel material, transmission lines, mains 6-inches or larger in diameter, and mains with a Maximum Allowable Operating Pressure (MAOP) greater than 60 psig.
[30] Predecessor to Spire Missouri East.
[31] See Case No. GS-2007-0130 and the *Gas Incident Report* filed on February 2, 2007.

1. Union Electric Company d/b/a AmerenUE[32] shall comply with the recommendations set out in the Staff of the Commission's Gas Incident Report filed in this matter.

2. Laclede Gas Company shall comply with the recommendation set out in the Staff of the Commission's Gas Incident Report filed in this matter, as specified in Staff's pleading filed on June 20, 2007.

3. The Staff of the Commission shall file, no later than October 1, 2007, a draft advisory notice as recommended in Staff's Gas Incident Report filed in this matter.

4. That if Union Electric Company d/b/a AmerenUE or Laclede Gas Company does not comply with the recommendations expected as a result of this incident, the Staff of the Commission shall file a complaint with the Commission.

5. That the Staff of the Commission shall inform the Missouri Attorney General's Office of ADB Utility Contractor's apparent violation of Section 319.037 RSMo (Cum. Supp. 2006).

Regarding ordered paragraph 1 above, AmerenUE filed a response on March 26, 2007, which agreed with the three recommendations and described actions that had already been taken or would be taken to implement the recommendations. Staff filed replies on April 2, 2007 and June 20, 2007 that found the responses and actions to be acceptable.

Regarding ordered paragraph 2 above, the recommendation to Laclede Gas Company ("Laclede") was Recommendation 4[33] in the *Gas Incident Report*. Laclede filed a response to the *Gas Incident Report* and Recommendation 4 on March 5, 2007. Staff filed an initial reply on April 2, 2007, and filed a second reply on June 20, 2007 following additional discussions

[32] Union Electric Company now does business in Missouri as Ameren Missouri.

[33] Recommendation 4 stated:

> 4. The Staff recommends that Laclede review the procedures, practices, training, and number of personnel that are used for excavation inspections in the vicinity of its natural gas pipelines and determine how to increase the number of excavation inspections conducted. The Staff specifically recommends that Laclede have a goal to make at least one visit to each horizontal boring project during the course of the project, especially when the excavator has a history of damaging Laclede facilities during horizontal boring excavations. The Staff recommends that Laclede submit the results of the review and an estimated schedule for actions to the Staff.

with Laclede. The Commission's Order separately stated the following regarding the Staff's pleading on June 20, 2007:

> Staff later filed a second reply wherein it stated that after further discussions with Laclede, they have agreed that focus should be placed on boring excavators that create concern for Laclede based on prior facility damage history. Specifically, when locating personnel respond to an excavation notification and identify that such an excavator is involved in a long duration boring project, Laclede will volunteer personnel to perform a site visit during the project and will document this visit. Laclede has also agreed to perform supplemental training to locating personnel on how to identify and act on situations where there is concern about an excavation project.

Regarding ordered paragraph 3 above, Staff filed a draft advisory notice on September 20, 2007. In a Commission Order issued on September 26, 2007, Staff was ordered to send the Advisory Notice to alert electric corporations, telecommunication companies and rural electric cooperatives (RECs) of the regulations concerning the installation of underground cable or conduit using horizontal boring. A copy of the Advisory Notice was sent on October 12, 2007 (*See* copy in Appendix C).

Regarding ordered paragraph 4, Staff has not filed any complaints regarding actions by Ameren, Laclede, or Spire with respect to the Commission Order.

Regarding ordered paragraph 5, Staff informed the Missouri Attorney General's Office on August 24, 2007, of the apparent violation.

2. Spire Actions to Comply with Ordered Conditions in Case No. GS-2007-0130

Staff submitted written questions to Spire to explain how the Company has complied with ordered paragraph 2 of the Commission Order issued on July 31, 2007 in Case No. GS-2007-0130, including how projects were identified and visited. The Spire response to each question stated:

> It is the Company's recollection that subsequent to the Stipulation and Agreement for GS-2007-0130, the Company discussed the implementation of the recommendation with Staff and that the two came to an understanding that the recommendation was impractical as written. This was due to the difficulty of determining the method of installation, duration of the project, and the actual start date of the work as this often

> does not align with the date on the ticket. Specifically, the Company found that boring was marked on a majority of tickets even though it was not always the installation technique. Thereafter, the Company discussed with Staff its continued focus on education with excavators especially those that create concern for the Company. In keeping with the intent of the recommendation, the civic improvement inspectors continue to focus efforts on those excavators that create concern for the Company despite being unable to identify the specific subset of excavations identified in the Stipulation and Agreement. Since the time of the Stipulation and Agreement with the State, the Company has implemented more modern methods of identifying work completed near critical facilities through its ticket management system.

Staff found no Stipulation and Agreement for Case GS-2007-0130 as stated above, and Spire later responded that they meant to reference the Commission Order issued on July 31, 2007. Spire also confirmed the understanding by Staff that this Commission Order has not been amended. Staff has not found in its records documentation of the discussions Spire referred to in this response. Staff requested documentation of these discussions from Spire; however, Spire stated that it did not have documentation of discussions.

According to information provided by Spire, while Spire has been making inspection visits to most[34] excavations near high-profile areas, Spire has not specifically attempted to perform a site visit after each instance when locating personnel respond to an excavation notification and identify that an excavator with damage history is involved in a long duration boring project. However, the notification of intent to excavate on Millers Court that Spire received from Missouri 811 was only for Millers Court and did not state that it was part of a larger boring project. Spire's locate contractor provided locate markings on the ground surface above the Spire facilities along Millers Court on February 23, 2022, which represents the full extent of the recorded actions by the locate contractor.

[34] Staff asked Spire: For the 2022 excavations that have occurred in HPA areas in Spire Missouri East, please provide the approximate percentage where 1 or more inspections of the excavation have been conducted. Spire's response stated: The Company has conducted excavation inspections on 80% of excavations that conflicted with HPA polygons.

3. Staff Analysis

Staff does not recall discussions with Spire regarding modifications to the Commission's Order issued on July 31, 2007, and notes that given the age of this case, such discussions may have occurred as long as 15 years ago. Based on Spire's recollection of these discussions, it is unclear to Staff why Spire would not have sought amendment to the Commission's Order issued on July 31, 2007 in Case No. GS-2007-0130.

Even though the directional drilling on Millers Court was part of a larger boring project in the neighborhood, the notice of intent to excavate only included the planned excavation along Millers Court. Staff does not have any information that Spire's locate contractor identified that this excavation was part of a long duration boring project. Based on Spire's explanations to Staff following the subject incident, Staff agrees that it may be difficult to determine when an excavator will be involved in a long duration boring project. This is because utility owners, including Spire, are notified of discrete areas of planned excavation work by the Missouri 811 for a narrow window of time before the work is planned to begin. The system intentionally limits excavator notifications to short term (work to begin within 10 days) so that the locations marked by utility owners are more like to remain visible prior to the excavation work beginning. Additionally, it is unclear to Staff that performing inspections of long duration boring projects would be the most effective means of reducing excavation damages. However, an excavator's history of damage to Spire facilities is information that is available to Spire. Additionally, Spire is notified when these same excavators are planning to perform future work near its facilities through the Missouri 811.

4. Violations

Staff did not find violations of the Commission Order issued on July 31, 2007 with respect to the incident at 3 Millers Ct., however Staff included one recommendation below that Spire seek to modify the Commission Order for actions going forward.

5. Staff Recommendations

1. Staff recommends that Spire evaluate actions that Spire can take to minimize damages to its natural gas pipelines by excavations involving boring and directional drilling. The

Staff recommends that Spire submit the results of the evaluation and a schedule for actions to the Commission.

2. Staff recommends that following an evaluation by Spire of actions that Spire can take to minimize damages to its natural gas pipelines by excavations involving boring and directional drilling, Spire seek to modify the Commission Order in Case GS-2007-0130 accordingly.

3. Staff recommends that the Commission send an updated Advisory Notice to telecommunication companies regarding directional drilling. See an example of such an Advisory Notice in Appendix C.

E. Gateway's Damage Prevention Program and Installation Practices

1. Regulatory Requirements

Commission rule 20 CSR 4240-18.010 – Safety Standards for Electrical Corporations, Telecommunications Companies, and Rural Electric Cooperatives.

(1) The minimum safety standards relating to the operation of electrical corporations, telecommunications companies, and rural electric cooperatives are Parts 1, 2, and 3 and Sections 1, 2, and 9 of the National Electrical Safety Code (NESC); 2017 Edition as approved by the American National Standards Institute on August 1, 2016, as modified by Errata thereto issued on September 13, 2016 and March 31, 2017, and published by the Institute of Electrical and Electronics Engineers, Inc., 3 Park Avenue, New York, NY 10016-5997. The NESC is composed of four (4) different parts and four (4) sections, each of which pertain to different aspects of the electric and telecommunications industries. Part 1 specifies rules for the installation and maintenance of equipment normally found in electric generating plants and substations. Part 2 pertains to safety rules for overhead electric and communication lines. Part 3 contains safety rules for underground electric and communication lines. Section 1 is an introduction to the NESC, Section 2 defines special terms, and Section 9 requires certain grounding methods for electric and communications facilities. The full text of this material is available at the Energy Analysis Section of the Utility Operations Department of the Public Service Commission, Suite 700,

200 Madison, Jefferson City, Missouri. This rule does not incorporate any subsequent amendments or additions.

(2) Electrical corporations, telecommunications companies, and rural electric cooperatives subject to regulation by this commission pursuant to Chapters 386, 392–394, RSMo shall comply with the safety standards established by this rule for new installations and extensions as described in the NESC.

(3) Incident reporting requirements for electrical corporations and rural electric cooperatives are found in 4 CSR 240-3.190(4).

(4) Those who excavate near underground facilities or conduct activities within ten feet (10') of overhead power lines are required to notify area utilities prior to engaging in such action, pursuant to the Underground Facility Safety and Damage Prevention Act, section 319.010, RSMo, and the Overhead Power Line Safety Act, section 319.075, RSMo.

The NESC is the national standard for safety in the design, construction, operation, and maintenance of public and private electric and communication systems. Section 1 of the NESC states that this includes the distribution of communication signals and data through public and private utility systems that are installed and maintained under the exclusive control of utilities or their authorized representatives. Utilities operating under the NESC are required to maintain control over the system up to the service point (delivery to premise wiring/cable) such that the system meets specified design requirements and the personnel installing, maintaining, and operating the system and its components are qualified to do so, are adequately supervised, use appropriate tools, and follow safe work procedures. Section 1 also states that the NESC rules apply to all new installations and extensions, and that all communication lines shall be designed, constructed, operated, and maintained to meet the requirements of these rules.

Section 2 of the NESC contains definitions for covered "lines" and other terms used in the code. The definition for "communication lines" includes a sentence stating that fiber-optic cables are considered to be communication lines[35].

[35] "Fiber-optic cables are considered as communication lines, regardless of whether they are installed in the communication space or supply space in accordance with applicable rules." "Fiber-optic cable – communications

Part 3, Section 32 of the NESC applies to telecommunication cables installed in an underground conduit system and Rule 320B5 for conduit systems requires providing for at least 12 inches of separation between communications facilities and gas lines unless there is an agreement to less separation by all involved utilities.

Missouri Revised Statute Sections 319.010 through 319.050 RSMo are known as the "Underground Facility Safety and Damage Prevention Act". Section 319.026 RSMo prescribes the requirements for excavator notifications:

> 319.026 1. An excavator shall serve notice of intent to excavate to the notification center by toll-free telephone number operated on a twenty-four hour per-day, seven day per-week basis or by facsimile or by completing notice via the internet at least two working days, but not more than ten working days, before the expected date of commencing the excavation activity. The notification center receiving such notice shall inform the excavator of all notification center participants to whom such notice will be transmitted and shall promptly transmit all details of such notice provided under subsection 2 of this section to every notification center participant in the area of excavation.

Section 319.037 RSMo includes requirements for excavation sites, and equipment prohibited at such sites.

> 319.037 1. Notwithstanding any other provision of law to the contrary, the procedures and requirements set forth in this section shall apply on the site of any excavation involving trenchless excavation, including directional drilling, where the approximate location of underground facilities has been marked in compliance with section 319.030 and where any part of the walls of the intended bore are within the marked approximate location of the underground facility.
>
> 2. The excavator shall not use power-driven equipment for trenchless excavation, including directional drilling, within the marked approximate location of such underground facilities until the excavator has made careful and prudent efforts to confirm the horizontal and vertical location thereof in the vicinity of the proposed excavation through methods appropriate to the geologic and weather conditions, and

is defined as a fiber-optic cable meeting the requirements for a communication line and located in the communication space of overhead or underground facilities."

> the nature of the facility, such as the use of electronic locating devices, hand digging, pot holing when practical, soft digging, vacuum methods, use of pressurized air or water, pneumatic hand tools or other noninvasive methods as such methods are developed. Such methods of confirming location shall not violate established safety practices. Nothing in this subsection shall authorize any person other than the owner or operator of a facility to attach an electronic locating device to any underground facility. For excavations paralleling the underground facility, such efforts to confirm the location of the facility shall be made at careful and prudent intervals. The excavator shall also make careful and prudent efforts by such means as are appropriate to the geologic and weather conditions and the nature of the facility, to confirm the horizontal and vertical location of the boring device during boring operations. Notwithstanding the foregoing, the excavator shall not be required to confirm the horizontal or vertical location of the underground facilities if the excavator, using the methods described in this section, excavates a hole over the underground facilities to a depth two feet or more below the planned boring path and then carefully and prudently monitors the horizontal and vertical location of the boring device in a manner calculated to enable the device to be visually observed by the excavator as it crosses the entire width of the marked approximate location of the underground facilities.

2. Gateway Actions to Comply with Commission Rules

Gateway is a telecommunications corporation in Missouri that is regulated by the Missouri Public Service Commission and must follow the Commission rules that apply such as 20 CSR 4240-18.010. Gateway uses contractors to install fiber optic cable systems in Missouri that are used by Missouri customers for internet and phone service, including the cable that was being installed on Millers Court. Gateway contracted with ** [redacted] ** to install the fiber optic cable on Millers Court. On February 15, 2022, JDK General Cable Contractors notified Missouri 811 of the intent to excavate along Millers Court as recorded on Missouri 811 Ticket No. 220463870.

Staff submitted written questions to Gateway about its telecommunication cable installation process, interactions with contractors, damage prevention program, and how these

applied to the installation on Millers Court in O'Fallon. The letter with Gateway's responses stated the responses should be considered a "closed record" pursuant to Missouri Revised Statue Section 610.021(1) and (14) RSMo, so the responses have been treated as confidential. ** [redacted] ** Staff asked if Gateway requires underground fiber optic cable installations by contractors/subcontractors to comply with the safety standards in 20 CSR 4240-18.010 and Gateway's response stated:

** [redacted] **

Staff asked if the fiber optic line being installed along the block of Millers Court at 3 Millers Ct. on March 1, 2022 was being installed in an underground conduit system (Part 3, Section 32 of the NESC), in an underground duct that is not part of a conduit system (Part 3, Section 35 of the NESC), or as a direct-buried cable (Part 3, Section 35 of the NESC). Gateway's response stated:

** [redacted] **

Staff asked if Gateway requires underground fiber optic cable installations by contractors/subcontractors to comply with the NESC and specifically if Gateway requires contractors/subcontractors to maintain at least 12 inches of separation between the conduit and existing gas lines as required by Rule 320B5 for conduit systems. Gateway's response stated to both questions stated:

** [redacted] **

Staff asked how many times were natural gas facilities damaged by either Gateway or a contractor or subcontractor between 1/1/2021 and 3/1/2022 and Gateway responded:

** [redacted] **

Staff asked Gateway if they employ inspectors to monitor work performed by contractors/subcontractors performing excavations and if so, to describe how such monitoring is performed. The Gateway responses stated:

** [redacted] **

Staff asked Gateway to describe any changes and enhancements made to its damage prevention program following the incident at 3 Millers Ct. and Gateway responded:

** [redacted] **

3. Staff Analysis

Prior to the incident, ** [redacted] **. Since the incident, Gateway stated that it has ** [redacted] **. Staff notes that in

addition to actions already taken by Gateway subsequent to the incident, Gateway must ensure that its telecommunication cables are installed in accordance with 20 CSR 4240-18.010.

4. Violations

For the cable conduit installation that damaged the natural gas main at 3 Millers Ct., Gateway did not follow 20 CSR 4240-18.010 and the incorporated NESC Rule 320B5 for conduit systems that requires providing for at least 12 inches of separation between communications facilities and gas lines.

In its performance of work on behalf of Gateway, JDK General Cable Contractors did not follow Section 319.037.2, RSMo. Specifically, when using directional drilling within the marked approximate location of the natural gas main, JDK General Cable Contractors did not first confirm the horizontal and vertical location of the natural gas main in the vicinity of the proposed excavation through an appropriate method. ** [redacted] **

5. Staff Recommendations to Gateway

Following the incident, Gateway has proactively taken several actions described above to improve its damage prevention performance. In addition to those actions, Staff also recommends the following.

1. Staff recommends that Gateway evaluate and modify its contractor procurement and oversight procedures and practices to ensure that telecommunications cables installed on behalf of Gateway are installed in accordance with 20 CSR 4240-18.010. The Staff recommends that Gateway submit the results of the evaluation and a schedule for modifications to the Commission.

2. Staff recommends that Gateway evaluate actions that Gateway can take to minimize damages to natural gas pipelines by excavations when installing telecommunication cables. The Staff recommends that Gateway submit the results of the evaluation and a schedule for actions to the Commission.

IV. STAFF'S FINDINGS

As a result of its investigation, Staff found that sufficient facts/information exist to assert the following violations:

Spire:

None

Gateway:

1. Failure to maintain at least 12-inches of separation between communications facilities and gas lines was a violation of 20 CSR 4240-18.010.
2. Failure of a contractor working on behalf of Gateway to confirm the horizontal and vertical location of the natural gas main in the vicinity of the excavation was a violation of Section 319.037.2. RSMo.[36]

(See III.E: *Gateway's Damage Prevention Program and Installation Practices*)

V. STAFF'S RECOMMENDATIONS

Throughout this Report, Staff has identified several areas that either require improvement or are violations of Commission Rules. Staff summarizes below its recommendations related to these areas requiring improvement and violations of Commission rules.

1. Staff recommends that Spire review, evaluate and update, as necessary, its reporting procedures to ensure that such procedures require revision or confirmation of its initial telephonic notice to the NRC within 48 hours after the confirmed discovery of an incident as required by 20 CSR 4240-40.020(3)(C).
2. Staff recommends that Spire evaluate actions that Spire can take to minimize damages to its natural gas pipelines by excavations involving boring and directional drilling. Staff further recommends that Spire submit the results of the evaluation and a schedule for actions to the Commission.

[36] ** [redacted] **

3. Staff recommends that following an evaluation by Spire of actions that Spire can take to minimize damages to its natural gas pipelines by excavations involving boring and directional drilling, Spire seek to modify the Commission Order in Case GS-2007-0130 accordingly.
4. Staff recommends that the Commission send an updated Advisory Notice to telecommunication companies regarding directional drilling. See an example of such an Advisory Notice in Appendix C.
5. Staff recommends that Gateway review, evaluate and update, as necessary, its contractor procurement and oversight procedures and practices to ensure that telecommunications cables installed on behalf of Gateway are installed in accordance with 20 CSR 4240-18.010. Staff further recommends that Gateway submit the results of the evaluation and a schedule for modifications to the Commission.
6. Staff recommends that Gateway evaluate actions that Gateway can take to minimize damages to natural gas pipelines by excavations when installing telecommunications cables. Staff further recommends that Gateway submit the results of the evaluation and a schedule for actions to the Commission.