MISSOURI PUBLIC SERVICE COMMISSION

STAFF'S GAS INCIDENT REPORT

310 SE Old Cannon Ball Rd
Holt, Missouri
October 5, 2023

Spire Missouri, Inc.
Case No. GS-2024-0137

Industry Analysis Division
Safety Engineering Department
November 27, 2024 - Jefferson City, Missouri

****** Denotes Confidential Information ******

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I. EXECUTIVE SUMMARY

A segment of a natural gas feeder line[1] in Holt, Missouri had become exposed in a creek bank due to soil erosion. Employees of Spire Missouri, Inc. ("Spire") and of a Spire contractor, ** [redacted] ** ("Pipeline Contractor") were installing a new 12-inch diameter steel pipe segment to replace the exposed segment, and retiring the exposed section of feeder line.

On October 5, 2023, the new pipeline segment had been installed and pressure tested. By 2:00pm on October 5, 2023, Spire employees completed installation of stopple fittings[2], vent stacks and an air handler in order to block the flow of gas into the exposed segment of pipe. When properly seated within a pipeline, a stopple fitting will block the majority of gas flow, however Spire's experience had been that some small amount of gas may escape around the fitting. Vents and an air handler were installed to purge any gas escaping beyond the stopple fitting into the cut end of the pipe. Spire employees cut and removed a short piece of the pipe so that a cap could be welded onto the ends of the pipe by the Pipeline Contractor.

At approximately 2:45pm, employees of the Pipeline Contractor began installation of a gripper plug[3] into the ends of the cut pipe in preparation for welding on an end cap. The gripper plug was intended to provide an additional measure of safety should gas escape the stopple device, vents and air handler. However, the gripper plug was not designed or intended to be used for this purpose[4]. Gripper plugs were installed in the open ends of pipe to the north and south of the opening. The valve on the vent stacks of the air handler was shut off by an unknown party. When

[1] 20 CSR 4240-40.030(1)(B) defines feeder line as a distribution line that has a maximum allowable operating pressure (MAOP) greater than 100 psi gauge that produces hoop stresses less than twenty percent (20%) of specified minimum yield strength (SMYS).

[2] Stopple fittings are used to temporarily block or isolate the flow of gas in a section of a pipeline so that work can be performed on the isolated section in a non-combustible atmosphere.

[3] Gripper plugs are marketed for use in applications such as testing plumbing drains and vents. The gripper plug in use at this project was a ** [redacted] **, as evidenced by Spire's response to Staff data request 0011.3 and Spire's Attachment 11.3.

[4] Spire's response to Staff data request 0001 stated in part: Following the post incident investigation, the Company believes that the gripper plug should not have been installed in this instance. The gripper plug is not adequately rated for use in pressurized gas lines. Furthermore, gripper plug installation is not outlined in our company procedures.

an employee of the Pipeline Contractor was preparing to weld on end caps to the pipe, the gripper plug was forcefully ejected from the north end of the pipe opening, injuring the Pipeline Contractor employee.[5]

The injured Pipeline Contractor employee was first taken to Liberty Hospital by ambulance, then air-lifted and admitted to University Hospital in Columbia, Missouri.

The Pipeline Contractor employees completed cap installations at 12:45am on October 6, 2023.

No Spire or Pipeline Contractor employees were tested for the presence of drugs or alcohol.

Although Spire has acknowledged in its investigation of this incident that gripper plugs should not have been used, the gripper plugs used on this project were supplied by Spire and are shown in Spire design documents for the project. The design documents issued for construction on the Holt, Missouri pipeline relocation project were not approved or stamped by a licensed professional engineer.[6]

As a result of its investigation, Staff found that sufficient facts and information exist[7] to assert the following violations of Commission rules:

1. Failure to perform appropriate post-incident drug testing of the eight employees whose performance either contributed to the incident or could not be completely discounted as a contributing factor to the incident was a violation of 49 C.F.R. § 199.105(b)(1) as adopted by 20 CSR 4240-40.080. (See *Section III.D, Drug and Alcohol Testing* of this report).

2. Failure to perform appropriate post-incident alcohol testing of the eight employees whose performance either contributed to the incident or could not be completely discounted as a contributing factor to the incident was a violation of 49 C.F.R. § 199.225(a) as adopted by 20 CSR 4240-40.080. (See *Section III.D, Drug and Alcohol Testing* of this report).

[5] Spire's response to Staff data request 0011.3.
[6] Spire response to Staff data request 0011.3.
[7] Prior to finalizing this report, Staff provided a copy of the factual basis for its analysis to Spire to provide an opportunity to correct any factual inaccuracies and to identify confidential content. A copy of information edited as directed by Spire is provided in Appendix A (Public and Confidential).

3. Failure to document reasons for the decision not to test the eight covered employees for drugs was a violation of 49 C.F.R. § 199.105(b)(2) as adopted by 20 CSR 4240-40.080. (See *Section III.D, Drug and Alcohol Testing* of this report).

4. Failure to document reasons for the decision not to test the eight covered employees for alcohol was a violation of 49 C.F.R. § 199.225(a)(2)(i) as adopted by 20 CSR 4240-40.080. (See *Section III.D, Drug and Alcohol Testing* of this report).

5. Failure to follow Spire's written qualification program with regards to communication of changes that affect covered tasks was a violation of 20 CSR 4240-40.030(12)(D)3. Specifically, Spire did not communicate to its employees and contractors that ** [redacted]. ** (See *Section III.G, Operator Qualification* of this report).

Additionally, although the Commission's pipeline safety standards in 20 CSR 4240-40.030 are silent regarding licensure of pipeline designers, it appears to Staff that RSMo 327 may have such a requirement. Staff seeks the Commission's approval to refer the matter to the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors and Professional Landscape Architects (APEPLSPLA), including if appropriate by filing a complaint[8], and the Commission's authorization to provide an unredacted copy of this investigation report in support of its complaint if requested by the Missouri Board for APEPLSPLA.

[8] Information on the process is provided in the Consumer Complaint Guide: ConsumerComplaintDoc_ARC_2021.pdf (mo.gov).

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 Rules related to:
  - Incident Reporting Requirements in 20 CSR 4240-40.020;
  - Missouri Pipeline Safety Standards in 20 CSR 4240-40.030, including but not limited to the operator's[9] emergency response and failure investigation; and
  - Drug and Alcohol Testing requirements in 20 CSR 4240-40.080;
- Make recommendations, as applicable to Spire Missouri, Inc. ("Spire") with an objective of minimizing the possibility of recurrence.

III. STAFF ANALYSIS OF INCIDENT

A. Incident Description and Emergency Response

A segment of a natural gas feeder line[10] in Holt, Missouri had become exposed in a creek bank due to soil erosion. Figure 1 of Appendix B of this Report shows the approximate location of the feeder line and Figure 2 shows the exposed segment and creek. Spire's intended scope of work for October 5, 2023, included the replacement of the exposed segment with newly installed pipe[11].

[9] "Operator" is defined in 20 CSR 4240-40.030(1)(B)26 as "a person who engages in the transportation of gas." "Person" is defined in 20 CSR 4240-40.030(1)(B)27 as "any individual, firm, joint venture, partnership, corporation, association, county, state, municipality, political subdivision, cooperative association, or joint stock association, and including any trustee, receiver, assignee, or personal representative of them." Transportation of gas" is defined in 20 CSR 4240-40.030(1)(B)41 as "the gathering, transmission, or distribution of gas by pipeline or the storage of gas in Missouri."

[10] 20 CSR 4240-40.030(1)(B) defines feeder line as a distribution line that has a maximum allowable operating pressure (MAOP) greater than 100 psi gauge that produces hoop stresses less than twenty percent (20%) of specified minimum yield strength (SMYS).

[11] See Pages 5-7 of Attachment 11.3 in Appendix C of this Report.

This was to be accomplished by installation of stopple fittings[12] and vent stacks, purging[13] of new and replaced pipe segments, blow down (venting) of feeder line segment that was being replaced, and cutting and capping of the abandoned segment of feeder line. The work was being performed by Spire employees and employees of a Spire contractor, ** [redacted] ** ("Pipeline Contractor"). Additionally, an employee of ** [redacted] ** ("Inspection Contractor") was on site to observe and inspect the work on behalf of Spire.

Employees of Spire and the Pipeline Contractor were installing a 12-inch steel pipe segment and retiring the exposed section of feeder line, isolated between two stopple fittings. The stopple fittings were in position to shut off the flow of gas. The pipe had been cut between the stopple fittings and blown down (vented). The Maximum Allowable Operating Pressure (MAOP)[14] of the feeder line is 150 pounds per square inch gauge (psig). At the time of the incident, Spire estimated the pressure in the pipeline at this location to be 125 psig[15]. An employee of the Pipeline Contractor was preparing to cap downstream of one stopple.

Two vent stacks were installed downstream of the stopple with a valve and air handler on the vent nearest the stopple fitting. Figure 3 of Appendix B shows a close up of the vent stack that was used at the incident location. Confidential Figure 4 shows the configuration of the vent stacks and stopple fittings at the incident location.

The Pipeline Contractor employee inserted a gripper plug in the 12-inch pipe up to the V1 vent stack location. Gas was bleeding past the stopple fitting. The valve on V1 vent stack was closed, preventing gas from venting through the vent stack to the atmosphere. This resulted in a pressure build-up between the stopple fitting and the gripper plug and caused the gripper plug to

[12] Stopple fittings are size on size split tees for high-pressure pipeline isolation and hot tapping. They are specialized devices designed to fit stopple hot tapping machines and are used to temporarily block or isolate the flow in a section of a pipeline.
[13] Purging to activate a new pipeline segment involves injecting natural gas into one end of the segment in a controlled manner until all air is displaced and 100% gas is verified at the other end of the pipe segment. Purging to deactivate an existing pipe segment involves venting natural gas out of the pipe segment to the atmosphere or to an active system, and then injecting air (or inert gas) into one end of the segment in a controlled manner until all gas is displaced and 0% gas is verified at the other end of the pipe segment.
[14] 20 CSR 4240-40.030(1)(B) defines Maximum Allowable Operating Pressure as the maximum pressure at which a pipeline or segment of a pipeline may be operated under this rule.
[15] Spire's initial Form PHMSA F 7100.1 report completed for this incident and submitted on November 6, 2023, reported an operating pressure of 56 psig at the time of the incident. This was revised to 125 psig in a supplemental Form PHMSA F-7200.1 report submitted on October 29, 2024. Attachment 17-C provided in response to Staff data request 0017 is a chart recording of pressure at SE PP Highway and SE Cannonball Road and shows approximately 125 psig at the time of the incident.

be ejected from the open-cut end of the 12-inch steel pipe. Confidential Figures 4 and 5 of Appendix B of this Report show the gripper plug. The gripper plug hit the Pipeline Contractor employee's hand, and he was admitted to a hospital for treatment.

TABLE 1: SUMMARY OF EVENTS	
Date and Time	Activity
9/18/2023	Right-of-way was cleared, and new pipe delivered to the job site.
9/21/2023	Pipeline installation started; 500' of 12" steel pipe bored under the creek.
Prior to 10/5/2023	Three-way tees and valves installed at tie-in points. Tie-ins and pipe coating completed.
10/5/2023; prior to 9:45 a.m.	Pressure test of new pipe segment completed.
10/5/2023; 9:45 a.m.	New pipe segment blown down from pressure test; Spire tap crew began setting up the tap and purge.
10/5/2023; 10:00 a.m.	Vent stacks and air handler placed by the Spire tap crew.
10/5/2023; 1:45 p.m.	Stopple placed by the Spire tap crew; gaseous atmosphere air monitoring began.
10/5/2023; 2:00 p.m.	The existing pipe segment was purged.
10/5/2023; 2:30 p.m.	Spire crew cut and removed a short piece of the pipe so that a cap could be installed. Spire crew moved piece of pipe out of excavation hole, exited the hole, and began putting away tools.
10/5/2023; 2:45 p.m.	In preparation for welding two caps, Pipeline Contractor crew began installation of a gripper plug into the north-side of the cut pipe.
10/5/2023; 3:00 p.m.	Gripper plug ejected from pipe, injury occurred.
10/5/2023; 3:09 p.m.	Spire employee calls 911. After calling 911, Spire employee opens valve on vent stack of air handler that was in closed position.
10/5/2023; 3:18 p.m.	Injured Pipeline Contractor employee taken to Liberty Hospital emergency room by ambulance.
10/5/2023; 5:00 p.m.	Pipeline Contractor crew began welding a cap on the north-side of the project, then moved to the south-side of the project and welded on the second cap.
10/5/2023; 6:20 p.m.	Injured Pipeline Contractor employee air-lifted and admitted to University Hospital in Columbia, Missouri.
10/6/2023; 12:45 a.m.	Work on the pipe segment replacement was completed.

1. Regulatory Requirements:

20 CSR 4240-40.030(12)(J)[16] Emergency Plans requires that:

1. Each operator shall establish written procedures to minimize the hazard resulting from a gas pipeline emergency. 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 abuilding;

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

(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) (192.617), 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).

[16] Subsequent to the incident and effective on March 30, 2024, 20 CSR 4240-40.030(12)(J) was amended to adopt recent federal pipeline safety amendments. This amendment did not modify the requirements that were in effect at the time of the incident, but has added some additional requirements.

2. *Spire Actions to Comply with 20 CSR 4240-40.030(12)(J)1.:*

Spire provided a copy of its plan, ** [redacted] ** ("Emergency Plan") that was effective at the time of the incident.

The incident occurred at approximately 3:00pm on October 5, 2023. At 3:09pm, a call was made to 911 and the Spire's Supervisor of Maintenance was notified of the incident. At 3:18pm, the injured Pipeline Contractor employee was taken to the hospital by ambulance. Spire's Working Foreman noticed that a valve on the vent stack with the air handler was in the closed position and after calling 911, he opened the valve to vent natural gas that was escaping past the stopple fitting seal through the vent stack into the atmosphere.

After emergency personnel left the scene, the jobsite was evaluated by Spire and the Pipeline Contractor for any further safety concerns. Spire personnel met and developed a plan to continue forward with capping the pipe at the tie-in points on both sides of the creek. The Pipeline Contractor installed and welded the two caps to secure the feeder line system at the incident location.

3. Staff Analysis:

Spire's written emergency plan meets the minimum content requirements of 20 CSR 4240-40.030(12)(J)1. Prompt action was taken to provide medical attention to the injured person and to make safe the pipeline system in the area of the incident. Prompt action was also taken to vent natural gas to the atmosphere above the excavation, instead into the excavation, to make safe the excavation atmosphere.

4. Violations:

Staff found no violations with regards to the Emergency Plan requirements found in 20 CSR 4240-40.030(12)(J)1.

5. Staff Recommendations:

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

B. Investigation of Failures and Incidents

1. Regulatory Requirements:

Commission rule 20 CSR 4240-40.030(12)(L) in effect on October 5, 2023 required that each operator shall establish procedures for analyzing accidents and failures, including the selection of samples of the failed facility or equipment for laboratory examination, where appropriate, for the purpose of determining the causes of the failure and minimizing the possibility of recurrence.

Federal rule 49 C.F.R. § 192.617(a) in effect on October 5, 2023 required that each operator must establish and follow procedures for investigating and analyzing failures and incidents as defined in § 191.3, including sending the failed pipe, component, or equipment for laboratory testing or examination, where appropriate, for the purpose of determining the causes and contributing factor(s) of the failure or incident and minimizing the possibility of a recurrence.

Federal rule 49 C.F.R. § 192.617(b) in effect on October 5, 2023 required that each operator must develop, implement, and incorporate lessons learned from a post-failure or incident review into its written procedures, including personnel training and qualification programs, and design, construction, testing, maintenance, operations, and emergency procedure manuals and specifications.[17]

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

Spire provided its written procedure to investigate and analyze incidents that was in place on October 5, 2023, ** [redacted] **.[18]

Spire's procedure requires ** [redacted] **

Additionally, Spire's procedure requires ** [redacted] **.

[17] Amendments to 20 CSR 4240-40.030(12)(L) went into effect on February 29, 2024, which updated the rule to be commensurate with the corresponding federal rule 49 C.F.R. § 192.617 that was in effect on October 5, 2023.
[18] Spire's response to Staff data request 0011, and Spire's Attachment 11A.

Spire provided its October 12, 2023 Post Incident Review (PIR) for the Holt incident[19], which included a narrative of the incident, a brief analysis of the incident, lessons learned, and corrective action items to be taken by Spire. Staff has included a confidential copy of the PIR in Appendix C. In the PIR, Spire described the apparent cause of the incident to be ** "[redacted]" ** and Spire described one lesson learned from the incident to be, ** "[redacted]." ** Additionally, on the PIR, Spire included seven corrective action items to be completed by Spire:

**
[redacted]
**

Spire indicated that ** [redacted]. [20] ** Spire stated that for ** [redacted] **[21]

[19] Spire's response to Staff data request 0011.3 and Spire's Attachment 11.3.
[20] Spire's response to Staff data request 0011.4.
[21] Spire's response to Staff data request 0011.4.

As part of its documentation for its post incident investigation Spire provided its lessons learned document, which is included in Table 2 as ** [redacted] **[22] The lessons learned document provided Spire's reasoning why the incident occurred:

** [redacted] **

The lessons learned document additionally provided Spire's description on how to prevent recurrence:

** [redacted] **

Spire stated that for ** [redacted] **[23]

Spire provided a copy of ** [redacted] **[24]

Spire provided the results of its root cause analysis (RCA) of the incident[25], a copy of which is in Appendix C of this Report. The root cause analysis document includes a number of potential

[22] Spire's response to Staff data request 0011, and Spire's Attachment 11D.
[23] Spire's response to Staff data request 0011.4.
[24] Spire's response to Staff data request 0011.4 and Spire's Attachment 11.4.B.
[25] Spire's response to Staff data request 0012 and Spire's Attachment 12.

corrective actions that could be taken by Spire to prevent recurrence of the incident, including but not limited to ** [redacted] **

Spire stated, "the group that participated in the RCA reviewed all of the possible solutions in Confidential Attachment 12 and decided that all of the possible solutions required corrective actions."[26] Spire indicated that a number of these corrective actions have been completed, and that some are still in progress.

As part of its identified corrective actions following Spire's investigation of the incident, Spire updated procedures ** [redacted] **[27] Further discussion of these procedures is included in *Section III.E, Hot Tapping and Stopping* below. Spire additionally provided the Pipeline Contractor's investigation summary.[28] The investigation summary provided the Pipeline Contractor's reasoning why the incident occurred:

** [redacted] [29] [redacted]

[26] Spire's response to Staff data request 0012.2.
[27] Spire's response to Staff data request 0012.2 and Spire's Attachment 12.2.B., Spire also provided the previous versions of these procedures that were in effect on October 5, 2023 in response to Staff data request 0030.
[28] Spire's response to Staff data request 0011 and Spire's Attachment 11C.
[29] Staff's understanding is that as used in this context, ** [redacted] **.

[redacted] **

The investigation summary additionally provided the Pipeline Contractor's lessons learned:

** [redacted] **

3. <u>Staff Analysis:</u>

Spire's investigation of the incident in Holt, MO was thorough and appears to have met all the requirements of 49 C.F.R. § 192.617 and 20 CSR 4240-40.030(12)(L) in effect on October 5, 2023. However, while some of corrective action items that Spire identified as a result of its investigation have been completed, implementation of other potential corrective actions identified by Spire and the Pipeline Contractor are either still in progress or Staff has not been provided with documentation showing progress towards completion.

Additionally, Staff noted that some of the possible solutions detailed in Spire's root cause analysis documentation appear to be contradictory to one another ** [redacted] **[30], which appears to conflict with Spire's statement that "the group that participated

[30] Spire's response to Staff data request 0012 and Spire's Attachment 12, copy included in Appendix C.

in the RCA reviewed all of the possible solutions in Confidential Attachment 12 and decided that all of the possible solutions required corrective actions." Because of this, Staff's has a recommendation below that Spire provide a final listing of the corrective actions it intends to implement to the Commission, and that Spire routinely provide a status update on its progress to implement each corrective action.

Staff notes that there are some discrepancies on what Spire's procedures did and did not require between Spire's failure analysis and that of its Pipeline Contractor's. Spire's procedures are further discussed in *Section III.E, Hot Tapping and Stopping* of this Report.

4. Violations:

Although Staff has identified no violation of 49 C.F.R. § 192.617 or 20 CSR 4240-40.030(12)(L) regarding the investigation of failure and incident, Staff has recommendations to Spire below regarding Spire's investigation of failure and incident.

5. Staff Recommendations:

1. Staff recommends that Spire provide a final listing of corrective actions identified by Spire during its PIR and root cause analysis investigations to the Commission. For each identified corrective action item Staff recommends that Spire provide either the date the corrective action item was completed or a timeline for completion.
2. Staff recommends that Spire provide quarterly updates to the Commission regarding the status of implementation of each corrective action. If any identified corrective action item is no longer being considered as required by Spire, the reason(s) should be explained in the quarterly updates.

C. Incident Reporting Requirements

1. Regulatory Requirements:

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,[31] 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[32].

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.

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[33] by the operator, or as soon thereafter as practicable if emergency efforts to protect life and property would be hindered.

20 CSR 4240-40.020(6) requires that operators of distribution pipeline systems must submit U.S. Department of Transportation Form PHMSA 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).

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[31] 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.).

[32] The NRC abbreviation represents the federal National Response Center which is operated by the United States Environmental Protection Agency in cooperation with the United States Coast Guard.

[33] 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 seventeen thousand five hundred dollars ($17,500) or more, including loss to the gas operator or others, or both, and including the cost of gas lost;

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.; or 3. An event that is reported as a Federal incident under section (3).

2. Spire Actions to Comply with 20 CSR 4240-40.020(2)(C), (3), (4), and (6)

The ejection of the gripper plug, which caused the personal injury, occurred at approximately 3:00pm on October 5, 2023[34].

Spire employee ** [redacted] ** notified 911 of the incident at 3:09pm[35].

Spire stated that it had confirmed discovery that a reportable incident occurred at 6:20pm on October 5, 2023, when Spire was notified that the injured contract employee had been airlifted to a hospital in Columbia, Missouri and admitted overnight.[36]

Spire notified Staff of the incident by telephone at 6:35pm on October 5, 2023[37].

At 6:49pm on October 5, 2023, Spire provided initial notification to the NRC.[38] On October 6, 2023 at 4:14pm Spire provided the 48-hour update to NRC[39].

Spire provided the 30-day PHMSA F 7100.1 Incident Report to PHMSA on November 6, 2023.

3. Staff Analysis:

Initial notification to the NRC is required within one hour of "confirmed discovery". Confirmed Discovery is defined in 20 CSR 4240-40.020(2)(C) 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. Based on the definition of a "Federal Incident"[40] which includes a personal injury necessitating in-patient hospitalization, Staff believes that Spire's identification of confirmed discovery as the time it received notification that the injured contract employee had been airlifted to a hospital in Columbia, Missouri and admitted overnight, 6:20pm on October 5, 2023, is reasonable. Spire's initial notification to the NRC at 6:49pm on October 5, 2023 was within one hour of its confirmed discovery that a reportable event had occurred.

[34] Spire's response to Staff data request 0004.
[35] According to the interview with ** [redacted] ** on November 28, 2023.
[36] Spire's response to Staff data request 0004.1.
[37] Time documented by Staff as initial notification in its *Gas Incident Notification* record.
[38] Spire's response to Staff data request 0004, verified by Staff's check of Pipeline Data Mart for NRC Report No. 1380998.
[39] Spire's response to Staff data request 0004, verified by Staff's check of Pipeline Data Mart for NRC Report No. 1381071.
[40] 20 CSR 4240-40.020(2)(D).

Incident reporting to Missouri additionally includes when a personal injury involving medical care administered in an emergency room or health care facility, whether in-patient or outpatient, beyond initial treatment and prompt release after evaluation by a health care professional. Spire's initial telephonic notification to Staff at 6:35pm was within two hours following discovery that an event meeting the requirements for Immediate Notice of Missouri Incidents[41] had occurred.

Within 48 hours after the confirmed discovery of an incident, to the extent practical, an operator must revise or confirm its initial notification to the NRC.[42] Spire confirmed discovery of this incident at 6:35pm on October 5, 2023. Spire's second notification to the NRC on October 6, 2023 at 4:14pm was within 48 hours of its confirmed discovery of the incident.

Within 30 days after the confirmed discovery of an incident on a natural gas distribution system, an operator must submit an incident report to PHMSA[43], and provide a copy to Staff.[44] Spire submitted an incident report of PHMSA F 7100.1 Form to PHMSA on November 6, 2023. Staff notes that November 4, 2023 was a Saturday, and therefore considers the report to have been submitted within 30 days of the incident.

4. Violations:

Staff found no violations with respect to compliance with the Commission's rules pertaining to incident reporting.

5. Staff Recommendations:

Staff has no recommendations with respect to compliance with the Commission's rules pertaining to incident reporting.

[41] 20 CSR 4240-40.020(4).
[42] 20 CSR 4240-40.020(3)(C).
[43] 20 CSR 4240-40.030(6).
[44] 20 CSR 4240-40.020(5)(A)2.

D. Drug and Alcohol Testing

1. Regulatory Requirements:

Missouri pipeline safety rules adopt the Federal Drug and Alcohol Testing regulations[45] by reference in Commission rule 20 CSR 4240-40.080.[46] At the time the incident occurred, the Commission Rules adopted the Code of Federal Regulations dated October 1, 2017, 49 C.F.R. parts 40 and 199 by reference.[47] The descriptions and quotations of applicable requirements below are based on the October 1, 2017, 49 C.F.R. parts 40 and 199.

49 C.F.R. § 199.101 requires each operator to maintain and follow a written anti-drug plan that conforms to Part 199 and the Department of Transportation ("DOT") Procedures.[48] 49 C.F.R. § 199.202 requires each operator to maintain and follow a written alcohol misuse plan that conforms to Part 199 and the DOT Procedures.

20 CSR. 4240-40.080(4)(B) states that the references to "accident" in 49 C.F.R. §§ 199.105 and 199.225 should refer to a "federal incident reportable under 20 CSR 4240-40.020."

49 C.F.R. § 199.3 defines "employee" and "covered employee" as:

> a person who performs a covered function, including persons employed by operators, contractors engaged by operators, and persons employed by such contractors.[49]

49 C.F.R. § 199.3 defines "covered function" as:

> an operations, maintenance, or emergency-response function regulated by part 192, 193, or 195 of this chapter that is performed on a pipeline or on an LNG facility.[50]

[45] 49 C.F.R. §§ 40 and 199, are incorporated by reference in Commission rule 20 CSR 4240-40.080. At the time of the incident, Commission rule 20 CSR 4240-40.030 version July 1, 2020 was in effect, adopting the version of 49 C.F.R. §§ 40 and 199 as of October 1, 2017.
[46] 20 CSR 4240-40.080(1).
[47] Subsequent to the incident, Commission adopted more recent Federal amendments in File No. GX-2020-0112 effective July 30, 2020.
[48] 49 C.F.R. § 199.3 (defining DOT procedures as the Procedures for Transportation Workplace Drug and Alcohol Testing Programs published by the Office of the Secretary of Transportation in part 40 of Title 49).
[49] 49 C.F.R. § 199.3.
[50] *Id.*

49 C.F.R. § 199.3 defines "prohibited drug" as follows:

> Prohibited drug means any of the following substances specified in Schedule I or Schedule II of the Controlled Substances Act (21 U.S.C. 812): marijuana, cocaine, opiates, amphetamines, and phencyclidine (PCP).[51]

With respect to contractor employees, 49 C.F.R. §§ 199.115 and 199.245 state that an operator may provide by contract that the drug and alcohol testing, education and training required by 49 C.F.R. § 199 be carried out by the contractor, provided that:

a) the operator remains responsible for ensuring compliance with the requirements of 49 C.F.R. § 199; and

b) the contractor allows access to property and records by the operator, the Administrator, and if the operator is subject to the jurisdiction of a state agency, a representative of the state agency for the purpose of monitoring the operator's compliance with the requirements of this part.

Drug tests are required for covered employees for: pre-employment, post-accident and at any time during employment as part of a pool of covered employees subject to random selection for testing. These requirements are as follows:

- Pre-employment: 49 C.F.R. § 199.105(a) requires that: "No operator may hire or contract for the use of any person as an employee unless that person passes a drug test or is covered by an anti-drug program that conforms to the requirements of this part."[52]
- Randomly during employment: 49 C.F.R. § 199.105(c) provides that "except as provided in paragraphs (c)(2) through (4) of this section, the minimum annual percentage rate for random drug testing shall be 50 percent of covered employees."[53]

[51] *Id.*
[52] 49 C.F.R. § 199.105(a).
[53] 49 C.F.R § 199.105(c)(1).

- Post-Accident: 49 C.F.R. § 199.105(b) provides the post-accident[54] drug testing requirements: "As soon as possible but no later than 32 hours after an accident, an operator shall drug test each employee whose performance either contributed to the accident or cannot be completely discounted as a contributing factor to the accident. An operator may decide not to test under this paragraph but such a decision must be based on the specific information that the covered employee's performance had no role in the cause(s) or severity of the accident."[55]

Alcohol tests are required for covered employees post-accident:

- Post-Accident: 49 C.F.R. § 199.225(a) provides the post-accident[56] alcohol testing requirements: "As soon as practicable following an accident, each operator must test each surviving covered employee for alcohol if that employee's performance of a covered function either contributed to the accident or cannot be completely discounted as a contributing factor to the accident. The decision not to administer a test under this section must be based on specific information that the covered employee's performance had no role in the cause(s) or severity of the accident. If a test required by this section is not administered within eight (8) hours following the accident, the operator shall cease attempts to administer an alcohol test and shall state in the record the reasons for not administering the test."[57]
- 49 C.F.R. § 199.105(b)(2) states that if a drug test required by this section is not administered within the 32 hours following the accident, the operator must prepare and maintain its decision stating the reasons why the test was not promptly administered. If a test required by paragraph (b)(1) of this section is not administered within 32 hours following the accident, the operator must cease

[54] 20 CSR 4240-40.080(4)(B)(stating that the references to "accident" in §§199.3, 199.100, 199.105, 199.200, 199.221, 199.225, 199.227 and 199.234 should refer to a "federal incident reportable under 20 CSR 4240-40.020" instead.).
[55] 49 C.F.R. § 199.105(b)(1).
[56] 20 CSR 4240-40.080(4)(B) (stating that the references to "accident" in §§ 199.3, 199.100, 199.105, 199.200, 199.221, 199.225, 199.227 and 199.234 should refer to a "federal incident reportable under 20 CSR 4240-40.020" instead.).
[57] 49 C.F.R. § 199.225(1)-(2).

attempts to administer a drug test and must state in the record the reasons for not administering the test.

- 49 C.F.R. § 199.225(a)(2)(i) states that if an alcohol test required by this section is not administered within 2 hours following the accident, the operator shall prepare and maintain on file a record stating the reasons the test was not promptly administered.

2. *Spire's Actions to Comply with 20 CSR 4240-40.080:*

Spire identified a total of eight individuals who were assigned to the project and on site at the time of the incident: ** [redacted]. **[58]

2.1 Drug and Alcohol Plans:

Spire provided copies of its Drug and Alcohol Testing Policy as well as the Drug and Alcohol testing policies of Spire's Pipeline Contractor, and Inspection Contractor.[59]

2.2 Pre-Employment Drug Testing:

Spire provided documentation of pre-employment drug testing for three of its four employees on site at the time of the incident: ** [redacted] [60] **. Spire has also provided pre-employment drug testing for ** [redacted] [61] [redacted] [62]**

[58] Spire's Confidential Attachment 2C to its response to Staff data request 0002.
[59] Spire's response to Staff data request 0002.
[60] Spire's Confidential supplemental response to Staff data request 0026.2.
[61] Spire's Confidential Attachment 26 to its response to Staff data request 0026.
[62] Spire's Confidential response to Staff data request 0026.3.

2.3 Random Drug Testing:

Spire provided documentation of the number of random drug testing performed during calendar year 2022 for Spire and the testing pools for its contractors: ** [redacted]. **[63] The percentages of random drug tests for covered Spire and Spire's Pipeline Contractor employees respectively in 2022 were ** [redacted]. **

2.4 Post Incident Drug Testing:

Spire initially stated that following the incident: ** "[redacted]." **[64] Spire later supplemented this response to say: ** "[redacted]" [65] [redacted] **

In response to a Staff data request inquiring why no individuals were tested, Spire stated that: ** [redacted] **[66]

In response to a Staff data request for the basis that Spire used to determine that the performance of individual's working at the project site could be completely discounted as a contributing factor to the incident, Spire stated:

** [redacted]

[63] Spire's Confidential Attachment 27C provided in response to Staff data request 0027.
[64] Spire's initial response to Staff data request 0002 was provided on January 8, 2024.
[65] Spire's supplemental response to Staff data request 0002 was provided on January 16, 2024.
[66] Spire's response to Staff data request 0025.

[redacted] **[67]

3. Staff Analysis:

3.1 Drug and Alcohol Plans:

Spire's and the Pipeline Contractor's written Drug and alcohol Testing Policies are consistent with the requirements of 20 CSR 4240-40.080. However, neither policy addresses:

- Who is responsible for determining which employees need to be tested following an incident, or when this determination must be made;
- How and where specimens are to be collected from Spire and contractor employees who are working at a job site that is not in close proximity to a Spire or Contractor's office.
- How specimens are to be collected from hospitalized employees.

3.2 Pre-employment Drug Testing:

Staff verified by review or records that pre-employment testing was performed for six of the eight individuals working on site at the time of the incident: ** [redacted] ** who were on-site at the time of the incident. However, pre-employment testing records have not been provided for ** [redacted] ** which is Spire's explanation for why no pre-employment test record is available for ** [redacted]. ** This is consistent with the requirement in 49 C.F.R. § 199.117(a)(3) that records of employee drug testing results that show employees passed a drug test must be kept for at least one year.

[67] Spire's response to part 2 of Staff data request 0025.

3.3 Random Drug Testing:

For calendar year 2022 the minimum annual percentage rate for random drug testing required by 49 C.F.R. § 199.105 was 50 percent of covered employees. The percentages of random drug tests for covered Spire and Spire's Pipeline Contractor employees respectively in 2022 were ** [redacted].**

3.4 Post Incident Testing:

With respect to the Spire employees who were working on-site at the time of the incident, although Spire later determined that it did not consider the performance of ** [redacted] **[68] it appears that Spire made this determination after the time period in which testing for drugs and alcohol had already elapsed. Spire stated that : ** "[redacted]" **[69]. Therefore, each of these Spire employees should have been tested for drugs (49 C.F.R. § 199.105(b) as adopted by 20 CSR 4240-40.080) and alcohol (49 C.F.R. § 199.225(a) as adopted by 20 CSR 4240- 40.080). Out of 8 tests that were required to be performed (4 for drugs, 4 for alcohol), none were performed.

With respect to the employees of the Pipeline Contractor and Inspection Contractor working on site at the time of the incident, Spire stated that it ** [redacted]. **[70] Therefore, each of these three individuals should have been tested for drugs (49 C.F.R. § 199.105(b) as adopted by 20 CSR 4240-40.080) and alcohol (49 C.F.R. § 199.225(a) as adopted by 20 CSR 4240-40.080). Out of eight tests that were required to be performed (4 for drugs, 4 for alcohol), none were performed.

Staff notes that within the first 2 hours following the incident, Spire had not completely discounted the actions of any of the covered employees who performed work at the Holt, Missouri project on October 5, 2023, and therefore Staff's position is that Spire should have tested each

[68] Spire's response to part 2 of Staff data request 0025.
[69] Spire's response to part 1 of Staff data request 0025.
[70] Spire's response to part 2 of Staff data request 0035.

employee (including employees of Spire and of contractors) who was performing a covered function at the Holt, Missouri project that day.

Staff additionally notes that this is the second incident it has investigated where Spire ** [redacted]. ** In its investigation conducted in Case No. GS-2019-0015, Staff found that Spire failed to ensure that ** [redacted] ** were tested for drugs or alcohol following the incident. Staff subsequently filed a complaint in Case No. GC-2020-0127. As part of the Stipulation and Agreement the Commission approved in Case No. GC-2020-0127, Spire agreed to develop a guideline that would assist it in taking a more proactive role to ensure that Drug and Alcohol testing is performed as required when future incidents involve a contractor employee. In the current incident, Spire failed to ensure that its contractors' employees were tested following the incident, and none of the Spire employees who were working at the incident location were tested.

4. Violations:

1. Failure to perform appropriate post-incident drug testing of the eight employees whose performance either contributed to the incident or could not be completely discounted as a contributing factor to the incident was a violation of 49 C.F.R. § 199.105(b)(1) as adopted by 20 CSR 4240-40.080.

2. Failure to perform appropriate post-incident alcohol testing of the eight employees whose performance either contributed to the incident or could not be completely discounted as a contributing factor to the incident was a violation of 49 C.F.R. § 199.225(a) as adopted by 20 CSR 4240-40.080.

3. Failure to document reasons for the decision not to test the eight covered employees for drugs was a violation of 49 C.F.R. § 199.105(b)(2) as adopted by 20 CSR 4240-40.080.

4. Failure to document reasons for the decision not to test the eight covered employees for alcohol was a violation of 49 C.F.R. § 199.225(a)(2)(i) as adopted by 20 CSR 4240-40.080.

5. Staff Recommendations:

1. Staff recommends that Spire develop procedures that address the following:

- Establish who within Spire is responsible for determining which employees (including employees of contractors working for Spire) are to be tested following an incident.
- Establish a time-frame for making the determination whether or not to test employees following an incident. Staff recommends that this be done within two hours to meet the time requirements for alcohol testing. If it will be difficult for Spire to make this determination within two hours following an incident, Staff recommends that Spire adopt a policy that all employees working at an incident location be tested.
- Provide instructions for how and where specimens are to be collected following an incident. This should address the contingency that employees (including employees of contractors working for Spire) are working outside of their normal service area(s).
- Provide instructions for how specimens are to be collected, and by whom for hospitalized employees.

2. Staff recommends that Spire include in its written agreements with its contractors that perform covered functions on Spire's pipelines provisions to:

- Require that specimens be collected for drug and alcohol testing from each employee identified by Spire within two hours of a federally reportable incident.
- Require that each contractor either develop or adopt the procedures recommended for Spire above.
- Include the requirements of 49 C.F.R. §§ 199.115 and 199.245 that the contractor allows access to property and records by Spire, the Administrator, any DOT agency with regulatory authority over the operator or covered employee, and representatives of the Missouri Public Service Commission for the purposes of monitoring the operator's compliance with the requirements of 49 C.F.R. Part 199 as adopted in 20 CSR 4240-40.080.

E. Hot Tapping and Stopping

1. Regulatory Requirements:

20 CSR 4240-40.030(12)(C)1. requires each operator shall prepare and follow for each pipeline, a manual of written procedures for conducting operations and maintenance activities and for emergency response.

20 CSR 4240-40.030(12)(C)2.A. requires the manual required by paragraph (12)(C)1. must include procedures for the operating, maintaining, and repairing the pipeline in accordance with each of the requirements of this section and sections (13) and (14) to provide safety during maintenance and normal operations.

20 CSR 4240-40.030(12)(Q) Tapping Pipelines Under Pressure requires each tap made on a pipeline under pressure must be performed by a crew qualified to make hot taps.

2. Spire's Actions to Comply with Commission Rules as they apply to Hot Tapping and Stopping:

The Spire tapping crew that performed work on the Holt, Missouri project had successfully performed numerous hot taps on Spire's pipelines prior to the incident. As discussed further in *Section III.G, Operator Qualification* below, Spire personnel who made the hot tap were qualified individuals per Spire's operator qualification program.

As described in *Section III.B, Investigation of Failures and Incidents* above, Spire has two procedures that are put into effect to complete hot tapping and stopping on its pipelines, both of which were updated by Spire following the incident: ** [redacted] **[71] A confidential copy of each of these procedures is included in Appendix D of this report. Updates to ** [redacted] ** include the following additions related to "air-jacking":

[71] Spire's response to Staff data request 0012.2 and Spire's Attachment 12.2.B., Spire also provided the previous versions of these procedures that were in effect on October 5, 2023 in response to Staff data request 0030.

** [redacted] **

Spire's ** [redacted] [72]

[redacted] **

[72] In comments Spire provided to Staff on October 29, 2024, Spire stated: ** [redacted] **

3. Staff Analysis:

Spire used qualified individuals to perform the hot tap involved in this incident.

Staff reviewed Spire's ** [redacted] **, which was in effect on October 5, 2023, and the updated version ** [redacted] **. The procedure in effect on October 5, 2023 had no specific details regarding Spire's process for completing a tap on a steel pipeline utilizing the two vent stacks and air handling setup that was in place and described in *Section III.A, Incident Description and Emergency Response* of this report. Spire's updated procedure adds some basic information regarding "air-jacking", (Staff understands Spire's reference to "air-jacking" to be synonymous with what Spire has referred to as the air handler in its 30-day PHMSA F7100.1 Incident Report to PHMSA). However, the updated procedure still lacks any of the following specific information:

- How the "air-jacking" equipment is to be installed;
- In what instances it may be used;
- Methodology to determine proper sizing of the "air-jacking" equipment;
- Who is responsible to ensure the "air-jacking" equipment is properly sized, installed, and operating correctly before other work can proceed; and
- What qualifications are required for individuals tasked with set-up and operation of the "air-jacking" equipment.

Staff notes that although Spire has amended its ** [redacted] ** to include the use of "air-jacking" following the incident, the current text of the procedure would not prohibit the work practices followed at the Holt incident, specifically the use of ** [redacted] **.

Spire's procedure in effect on October 5, 2023, and the updated procedure refer to manufacturer's recommendations, however do not include a copy of these manufacturer recommendations nor a description on how to access the manufacturer recommendations. Further, there was a discrepancy between how Spire and its contractor read the requirements of its procedure as described in *Section III.B, Investigation of Failures and Incidents*. Specifically,

Spire stated that the gripper plug was not to be used[73] and its use was the apparent cause of the incident and the Pipeline Contractor stated that ** [redacted]. **[74]

Staff reviewed Spire's ** [redacted] **, which was in effect on October 5, 2023, and the updated version ** [redacted] **. Spire has included some changes in this procedure that could enhance safety while completing processes similar to that used during the incident, ** [redacted]. ** However, these changes are prefaced with "should" statements and therefore do not appear to Staff to be mandatory process changes. Staff agrees that ** [redacted] ** would be helpful. However, non-mandatory processes (prefaced by "should") are not by definition required to be implemented in every instance. Therefore, Staff does not believe that the revisions to this procedure alone would be sufficient to prevent recurrence of the incident.

Staff notes that the additional language Spire added to Section 5.6 could be interpreted more narrowly than Staff believes that Spire intended. Specifically, the sentence: ** [redacted] ** However, Staff notes that Spire's vent stack apparatus does not include a bypass or bypass valve. Additionally, the procedure still lacks the following specific information:

- Who is responsible for creating the written procedure to ** [redacted]
- [redacted]

[73] Spire's response to Staff data request 0001.1.
[74] Spire's response to Staff data request 0011 and Spire's Attachment 11C.

- [redacted]
- [redacted]
- [redacted] **

Staff does not find that Spire's updates to its procedures are sufficient to produce safe, repeatable results when conducting tapping, stopping, and capping operations similar to those required by the project in Holt, MO, and has recommendations for further updates.

4. Violations:

Staff found no violations with regards to the pipeline tapping requirements found in 20 CSR 4240-40.030(12)(Q). However, Staff does not believe that Spire's procedures in place at the time of the incident and, as described in Staff's analysis above, Spire's subsequently amended procedures are sufficient to provide a reasonable level of safety. Staff has included a recommendation that Spire amend its plans and procedures regarding tapping, stopping, and capping operations similar to those required by the project in Holt, MO to include detailed processes that can produce safe, repeatable results when conducting these operations.

5. Staff Recommendations:

1. Staff recommends that Spire amend its plans and procedures regarding tapping, stopping, and capping operations similar to those required by the project in Holt, MO, to include detailed processes that can be followed to produce safe, repeatable results when conducting these operations. Amendments should include, but not be limited to:
    - All sub-processes that could be utilized during tapping and stopping procedures as they relate to safety (such as "air-jacking", lockout tagout, or other such sub-processes), including detailed methodology and when it is and is not approved to use the sub-process;

- Information about which specific valves and equipment are subject to the lockout, tagout procedures and sub-processes; and
- How to determine qualification requirements in order to verify qualified individuals are performing any covered tasks.

Staff further recommends that any relevant changes to Spire procedures with regards to safety during these operations be written as required processes (e.g., "shall" or "must" instead of "should" language).

2. Staff recommends that if Spire intends to utilize a lockout tagout process during tapping, stopping, and venting operations that Spire develop a written lockout tagout procedure to be put into effect during those processes and that written procedure include, but is not limited to:
    - Details on personnel authority for completing a lockout and/or tagout including determination of whom has the authority to do so;
    - Details on personnel authority for releasing a lockout and/or tagout including determination of whom has the authority to do so;
    - Details on whether a lock or a tag, or a lock and a tag will be utilized in these processes and specifically how the lock and/or tag will prevent unauthorized operation of equipment;
    - Details on how Spire will train employees and contractors on how to put the lockout tagout procedure into effect and what training or qualifications will be required to obtain the authority to lockout or tagout equipment and release a lockout or tagout; and
    - Details on how Spire will train all of its employees and contractors on how to recognize when equipment has been locked and/or tagged out, and how to recognize who has the authority to release a locked or tagged out piece of equipment.

F. Prevention of Accidental Ignition

1. Regulatory Requirements:

20 CSR 4240-40.030(13)(X) Prevention of Accidental Ignition requires that each operator shall take steps to minimize the danger of accidental ignition of gas in any structure or area where the presence of gas constitutes a hazard of fire or explosion, including the following:

1. When a hazardous amount of gas is being vented into open air, each potential source of ignition must be removed from the area and a fire extinguisher must be provided;

2. Gas or electric welding or cutting may not be performed on pipe or on pipe components that contain a combustible mixture of gas and air in the area of work; and

3. Warning signs shall be posted, where appropriate.

2. Spire Actions to Comply with 20 CSR 4240-40.030(13)(X):

Spire provided a copy of its ** [redacted] ** procedure that was in effect at the time of the incident. For purging of natural gas from the existing pipeline segment that was being replaced, natural gas was vented out of the excavation and to the atmosphere using vent stacks. Spire verified there were no overhead utilities at the vent stacks and a fire extinguisher was provided.

Gas was seeping past the stopple fitting to the pipe that was to be cut and capped. Two vent stacks were installed near the stopple fitting, and the closest vent stack used what Spire calls an "air handler"[75] to create a vacuum from the 12-inch pipe and vent the natural gas out of the excavation and to the atmosphere. A fire extinguisher was provided near the location of the vent stacks.

After cutting the pipe and removing a cylinder of pipe, a gripper plug was inserted in to the open pipe in preparation for welding a cap on the open pipe. Prior to welding the cap, the gripper plug ejected from the open pipe and released gas out the open pipe and into the excavation. This gas release from the open pipe was unintentional and unplanned, and no accidental ignition occurred. After the gas release, a valve in the vent stack below the "air handler" was found in the

[75] The "air handler" involves injecting compressed air into the vent stack and is pointed upward, creating a venturi effect that pulls a vacuum from the pipe below that is connected to the vent stack.

closed position and was opened. The closed valve had stopped natural gas from venting out the vent stack and gas pressurized in the 12-inch pipe behind the gripper plug until the gripper plug was ejected.

3. Staff Analysis:

Although natural gas was released during the work associated with this incident, no ignition occurred. However, if the gripper plug had been ejected at a time when there was an active ignition source, such as the use of a grinder or welder, it is likely that the released natural gas would have ignited in the excavation in close proximity of one or two workers.

4. Violations:

Staff found no violations with regards to the Prevention of Accidental Ignition requirements found in 20 CSR 4240-40.030(13)(X), but does have a recommendation.

5. Staff Recommendations:

Staff recommends that Spire review its procedures and practices for prevention of accidental ignition during the work activities that were involved in this incident and make revisions to prevent recurrence of this incident and the near-miss of an accidental ignition in an occupied excavation. These revisions should ensure the use of a gripper plug is not allowed going forward and that only acceptable methods for gas pipeline isolation, such as double block and bleed[76] stopple fittings, are used going forward to address concerns with gas bleeding past a stopple fitting.

[76]"Double block and bleed" refers to a method of isolation that involves closing two valves (or plugging heads in the case of a stopple fitting) to create a barrier between the source of hazard and a break of containment. A bleed valve located between the two block valves is used to bleed any pressure that may build up in the space between the block valves.

G. Operator Qualification

1. Regulatory Requirements:

20 CSR 4240-40.030(12)(D), Qualification of Pipeline Personnel, prescribes the required qualifications of individuals performing covered tasks on a pipeline facility,[77] including any other entity or individual performing covered tasks on behalf of the operator.[78] A "covered task" is defined by 20 CSR 4240-40.030(12)(D)1.B. as "an activity, identified by the operator, that:

(I) Is performed on a pipeline facility;

(II) Is an operations, maintenance or emergency-response task;

(III) Is performed as a requirement of this rule; and

(IV) Affects the operation or integrity of the pipeline."[79]

20 CSR 4240-40.030(12)(D)2.C. defines "qualified" to mean "that an individual has been evaluated and can:

(I) Perform assigned covered tasks; and

(II) Recognize and react to abnormal operating conditions."[80]

Therefore, an individual must be evaluated in order to be considered qualified to perform covered tasks.

Program Requirements:

20 CSR 4240-40.030(12)(D)3., requires that each operator have and follow a written qualification program that includes provisions to:

[77] 20 CSR 4240-40.030(1)(B)33 (defining a "pipeline facility" as "new and existing pipelines, rights-of-way, and any equipment, facility, or building used in the transportation of gas or in the treatment of gas during the course of transportation.").
[78] 20 CSR 4240-40.030(12)(D)1.A. ("This subsection applies to all individuals who perform covered tasks, regardless of whether they are employed by the operator, a contractor, a subcontractor, or any other entity performing covered tasks on behalf of the operator.").
[79] 20 CSR 4240-40.030(12)(D)1.B.
[80] 20 CSR 4240-40.030(12)(D)2.A. (defining "abnormal operating condition" as "a condition identified by the operator that may indicate a malfunction of a component or deviation from normal operations that may:(a) indicate a condition exceeding design limits; (b) result in a hazard(s) to persons, property, or the environment; or (c) require an emergency response.").

A. Identify covered tasks;

B. Provide training, as appropriate, to ensure that individuals performing covered tasks have the necessary knowledge and skills to perform the tasks in a manner that ensures the safe operation of pipeline facilities;

C. Ensure through evaluation that individuals performing covered tasks are qualified and have the necessary knowledge and skills to perform the tasks in a manner that ensures the safe operation of pipeline facilities;

D. Allow individuals that are not qualified pursuant to this subsection to perform a covered task if directed and observed by an individual that is qualified;

E. Evaluate an individual if the operator has reason to believe that the individual's performance of a covered task contributed to an incident meeting the Missouri reporting requirements in 20 CSR 4240-40.020(4)(A);

F. Evaluate an individual if the operator has reason to believe that the individual is no longer qualified to perform a covered task;

G. Communicate changes, including changes to rules and procedures, that affect covered tasks to individuals performing those covered tasks and their supervisors, and incorporate those changes in subsequent evaluations;

H. Identify the interval for each covered task at which evaluation of the individual's qualifications is needed, with a maximum interval of thirty-nine (39) months;

I. Evaluate an individual's possession of the knowledge and skills under paragraph (12)(D)4. at intervals not to exceed thirty-nine (39) months;

J. Ensure that covered tasks are:

(I) Performed by qualified individuals, or

(II) Directed and observed by qualified individuals.[81]

[81] 20 CSR 4240-40.030(12)(D)3.A-I.

2. Spire's Actions to Comply with 20 CSR 4240-40.030(12)(D):

Spire provided ** [redacted] **, the written operator qualification (OQ) program that was applicable to all Spire and contractor personnel performing work on the project where the incident occurred in Holt, Missouri on October 5, 2023.[82]

Spire identified the following covered tasks that were expected to be performed by Spire Missouri West Employees for the project in Holt, Missouri, where the incident occurred[83]:

**

[redacted]

**

Spire stated that a tap crew consisting of four Spire employees were performing the work identified in Table 3 above. Spire provided records showing all four of these employees were each currently qualified to perform all the covered tasks listed in Table 3 above.[84]

[82] Spire response to Staff data requests 0005 and 0006.
[83] Spire response to Staff data request 0005.
[84] Spire response to Staff data request 0007 and Spire's Attachment 7.

Spire identified the following covered tasks that were expected to be performed by contractor employees for the project in Holt, Missouri, where the incident occurred[85]:

**

**

Spire stated that a contractor crew consisting of three individuals was present to perform work at the project in Holt, Missouri, where the incident occurred, however only one of these individuals was responsible for performing the covered tasks identified in Table 4 above. Spire provided records showing the contract employee responsible for performing covered tasks was currently qualified to perform both covered tasks identified in Table 4 above[86].

Spire further stated: ** “ ” **[87]

Spire’s ** ** includes ** ** which states:

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-
-
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[85] Spire response to Staff data request 0006.
[86] Spire response to Staff data request 0008 and Spire Attachment 8.
[87] Spire response to Staff data requests 0005 and 0006.

[redacted] **

Spire has stated that it believes the use of a gripper plug on this project was contrary to Spire procedures.[88] Spire identified ** [redacted] ** in its root cause investigation of this incident.[89] On the Holt, Missouri project, Spire's ** [redacted] .[90] ** These drawings were included in a work order package that was sent to the following Spire departments for review for consistency with the standards and/or procedures of the departments: ROW, Environmental, Pipeline Safety and Compliance, Field Ops, System Planning, Pressure and Measurement, Gas Control, Pipeline Management, Supply Chain, Safety Management Systems and Workload Planning. When asked to describe the actions Spire took to communicate the change to Spire's standard as it relates to allowing/disallowing the use of gripper plugs to those individuals who were qualified to perform the covered tasks related to the standard,

[88] Spire's response to Staff data request 0001.1.
[89] Spire's response to Staff data request 0012.
[90] Spire's response to Staff data request 0014. Attachment 14D provides the design documents, Spire's response to Staff data request 0001.2 confirms that the purpose of these documents was for use during construction.

and their supervisors, Spire stated, "Spire is not able to locate any documentation of the actions that communicated the change but will supplement this response if any such documentation is located." No supplemental responses were provided.

3. Staff Analysis:

Staff's analysis of Spire's OQ program and records showed that qualified individuals were used to perform work at the project in Holt, Missouri, where the incident occurred.

There is no evidence that either the designers, reviewers or any persons involved with the work performed in Holt, Missouri on October 5, 2023 were aware that ** [redacted]. ** Spire's procedure ** [redacted] ** neither specifically prohibits the use of gripper plugs, nor does it contain a general statement that no tools or equipment may be used unless specifically referenced in the procedure.

Additionally, Spire's Pipeline Contractor stated in its investigation of incident summary that Spire's procedure ** "[redacted]." ** Because Spire stated that there was no related documentation of any actions that that communication of the change occurred, Staff does not know what efforts, if any, Spire made to communicate to its employees and contractors that the use of gripper plugs was no longer in accordance with Spire procedures. However, it is apparent from the actions of Spire's employees responsible for creating and reviewing the design (e.g., construction engineering department, and review team) and the Pipeline Contractor that these efforts were not successful.

4. Violations:

Staff found sufficient evidence to assert the following violation with regards to operator qualification:

1. Failure to follow Spire's written qualification program with regards to communication of changes that affect covered tasks was a violation of 20 CSR 4240.030(12)(D)3. Specifically, Spire did not communicate to its employees and contractors that ** [redacted]. **

5. Staff Recommendations:

Staff recommends that Spire follow its procedure with respect to changes to covered tasks performed on its pipelines. Additionally, Staff recommends that for each change in a procedure that can potentially affect a covered task, the procedure should be updated to address:

A. Communication of the change(s) to the persons responsible for design and planning of these covered tasks; and
B. Including evaluation criteria regarding the changes in the testing criteria for qualification or re-qualification on the affected covered tasks.

H. Distribution Integrity Management Program ("DIMP")

1. Regulatory Requirements:

Commission rules require each gas distribution operator, other than a master meter operator, to develop and implement a Gas Distribution Integrity Management Program ("DIMP") no later than August 2, 2011. Program elements must include a demonstrated knowledge of the system, identification of threats, evaluation and ranking of risk, identification and implementation of measures to address risks, measurement of performance, monitoring of results and evaluation of effectiveness. Sources of data to be considered in DIMP includes, but is not limited to incident history. In implementation of DIMP, a baseline is established for threats to monitor the effectiveness of the program.

At a minimum, operators must consider the following categories of threats to each gas distribution pipeline:

- Corrosion,
- Natural Forces,
- Excavation Damage,
- Other Outside Force Damage,
- Material or Welds,
- Equipment Failure,
- Incorrect Operation, and
- Other concerns that could threaten the integrity of its pipeline.

To comply with the knowledge of the system part of this rule[91], an operator must:

- Demonstrate an understanding of its gas distribution system developed from reasonably available information, identify the characters of the pipeline's design and operations and the environmental factors that are necessary to assess the applicable threats and risks to its distribution pipeline,
- Consider information from past design, operations and maintenance, and
- Identify additional information needed and provide a plan for gaining that information over time through normal activities conducted on the pipeline.

Gas distribution system operators must consider reasonably available information to identify existing and potential threats[92], evaluate the relative importance of each threat, and estimate and rank the risks posed to its pipeline[93]. Operators must determine and implement measures to address the risks[94], then measure performance and evaluate the effectiveness of the program in controlling each identified threat[95].

2. Spire Actions to Comply with 20 CSR 4240-40.030(17):

Spire provided a copy of its written DIMP Plan ** [redacted] ** published August 31, 2021, that was in effect at the time of the incident.[96]

In its incident report provided to PHMSA[97], Spire lists the apparent cause of the incident as ** [redacted] ** In the DIMP Plan that was effective for Spire at the time of the incident, incorrect operation is identified as a potential threat. Specifically, Spire stated:

[91] 20 CSR 4240-40.030(17)(D)1.
[92] 20 CSR 4240-40.030(17)(D)2.
[93] 20 CSR 4240-40.030(17)(D)3.
[94] 20 CSR 4240-40.030(17)(D)4.
[95] 20 CSR 4240-40.030(17)(D)5.
[96] Spire response to Staff data request 0010.
[97] 20 CSR 4240-40.020(6)(A) requires that each operator submit a federal incident report on Form PHMSA F 7100.1 as soon as practicable but not more than thirty (30) days after detection of an incident required to be reported under 20 CSR 4240-40.020(3). Spire's incident report was provided in response to Staff data request 0009.

** [redacted] **[98]

Staff inquired if Spire had any planned changes to its DIMP with regards to the threat of incorrect operations moving forward and Spire stated:

** [redacted] **[99]

3. Staff Analysis:

Staff concurs with Spire's assessment that this incident was a result of incorrect operations. Staff additionally agrees that, while Spire had not identified incorrect operations as a top threat prior to this incident, Spire should make adjustments to its identification of potential sub-threats under the threat category of incorrect operations in its DIMP.

4. Violations:

Although Staff found no violations with respect to 20 CSR 4240-40.030(17), Staff has included recommendations with regards to Spire's DIMP to ensure that potential threats to Spire's system can be evaluated accurately moving forward.

[98] Spire response to Staff data request 0010.
[99] Spire response to Staff data request 0010.

5. Staff Recommendations:

1. Staff recommends that Spire implement the changes to its DIMP Plan as outlined in Spire's response to Staff data request 0010, part E, specifically to ** [redacted] **

2. Staff recommends that Spire conduct a DIMP program re-evaluation including the changes outlined in Spire's response to Staff data request 0010, part E, in order to determine the relative risk of each threat including sub-threats within the threat category of incorrect operations. Additionally, as part of the DIMP program re-evaluation, Staff recommends that Spire ensures that it determines if any measures to address the risk posed by incorrect operations are necessary to reduce the risk posed to its pipeline.

I. Oversight of Contractors

1. Regulatory Requirements:

20 CSR 4240-40.030(12)(B)3. states that each operator is responsible for ensuring that all work its contractors complete on its pipelines complies with this rule.

20 CSR 4240-40.030(12)(C) requires that each operator prepare and follow for each pipeline a manual of written procedures for conducting operators and maintenance and for emergency response, including each of the requirements of section (12).[100]

In a Stipulation and Agreement approved by the Commission in Case No. GC-2020-0127[101], Spire agreed to do the following:

- To update its Standards and Procedures for Contractor Oversight Requirements[102],

[100] 20 CSR 4240-40.030(12)(C)2.B. requires that the manual includes procedures for safe operating and maintaining the pipeline in accordance with each of the requirements of sections (12), (13) and (14) of 20 CSR 4240-40.030.
[101] The Stipulation and Agreement was filed November 6, 2019 and approved by the Commission on November 21, 2019.
[102] Paragraph 6 of Stipulation and Agreement.

- To create a list of tasks that require oversight when the tasks are to be performed by a contractor[103],
- To be more proactive in ensuring contractors are maintain compliance with Commission pipeline safety rules, including[104]:
    - Reviewing contractor training materials,
    - Conducting random or routine field evaluations of contractor employees' knowledge, skills and abilities to perform assigned tasks, at a minimum:
        - Field verification of contractor company qualifications to perform the covered tasks,
        - Verification that the procedures being used in the field are the same as the latest approved procedures and that the procedures are being followed,
        - Determination that all tools and special equipment identified in the procedures are present at the job site and are properly employed in the performance for the tasks are used as described,
        - Verification that the individuals performing covered tasks are cognizant of the Abnormal Operating Conditions ("AOCs") that are applicable to the tasks observed,
        - Quality Assurance checks (working fire extinguishers, personal protective equipment).

2. *Spire Actions to Comply:*

Spire provided a copy of its ** [redacted] ** in response to a Staff data request[105] to provide copies of Spire policies and procedures related to Spire oversight and inspection of contractors working on Spire's pipelines. ** [redacted]

[103] Paragraph 7 of the Stipulation and Agreement.
[104] Paragraph 8 of the Stipulation and Agreement.
[105] Staff data request 0003.

[redacted] **

An employee of the Inspection Contractor on this project, ** [redacted] ** was on site to oversee work performed on the Holt, Missouri pipeline relocation project. At the time the incident occurred, Spire's Inspection Contractor was in his truck approximately100 feet away from the incident location[106]. Spire's Inspector Contractor was onsite to provide routine inspection and oversight of the project, and was required to observe tasks that were listed ** [redacted]. **[107]

For the work being performed on October 5, 2024, Spire stated that: ** [redacted]. ** Spire also stated that it did not complete a Gas Interruption/Shutdown of Main Procedure in Holt Missouri on October 5, 2023.[108]

3. <u>Staff Analysis:</u>

Staff reviewed Spire's ** [redacted] ** and found that it meets the requirements of 20 CSR 4240-40.030(12)(B)3., and paragraphs 6-8 of the November 6, 2019 Stipulation and Agreement in Case No. GC-2020-0127.

Prior to the occurrence of this incident, ** [redacted] **, an employee of the Pipeline Contractor, was preparing to begin welding a cap on a 12-inch steel main downstream of a stopple.[109] Specifically, he was working to install a gripper plug into the open end of pipe on which he would subsequently install the end-cap. Spire's ** [redacted]. **

[106] Spire's Attachment 11.3 provided in response to Staff data request 0011.3.
[107] Spire response to Staff data request 0003.1.
[108] Spire response to Staff data request 0031.
[109] Spire's response to Staff data request 0003.1.

Spire's Inspector Contractor did not observe the welding preparation. Staff notes that welding is not a task that Spire's procedure would require Spire's Contractor Inspector to observe, as it is not listed in ** [redacted]. ** ** [redacted] **[110] However, Spire also acknowledges ** [redacted]. **[111] It is possible that if Spire's Inspector Contractor had been observing the work being performed by ** [redacted] ** prior to the incident that Spire's Contractor Inspector would have realized ** [redacted]. ** However, it is also possible that Spire's Contractor Inspector would have been aware of the ** [redacted]. ** Staff therefore has no reason to believe that direct observation of ** [redacted] ** activities leading up to the incident by Spire's Contractor Inspector would have prevented the occurrence of this incident.

4. *Violations:*

Staff found no violations of 20 CSR 4240-40.030(12)(B)3.

5. *Staff Recommendations:*

Staff recommends that Spire communicate procedural changes such as ** [redacted] ** to its Inspection Contractors.

[110] Spire's Attachment 11.3 provided in response to Staff data request 0011.3.
[111] Spire's Attachment 11.3 provided in response to Staff data request 0011.3.

J. Project Design

1. Regulatory Requirements:

RSMo 327.181.2. states: "Professional engineers shall be in responsible charge[112] of all engineering design of buildings, structures, products, machines, processes, and systems that can affect the health, safety, and welfare of the public within their scope of practice."

Following its investigation into a natural gas incident that occurred on September 13, 2018, in the Merrimack Valley region of Massachusetts[113], the National Transportation Safety Board (NTSB) issued a report[114] that included a recommendation to 31 states, including Missouri, to:

> Remove the exemption so that all future natural gas infrastructure projects require licensed professional engineer approval and stamping. (P-19-16)[115]

The NTSB stated that a comprehensive constructability review, which would require all departments to review each project, along with the seal of approval from a registered P.E., likely would have identified a design omission that led to the accident.[116] Further, the NTSB concluded that requiring a licensed professional engineer to stamp plans would illustrate that the plans had been approved by an accredited professional with the requisite skills, knowledge, and experience to provide a comprehensive review.[117]

The NTSB sent letters dated October 24, 2019 addressed to the governors of each of these 31 states, including the Honorable Michael L. Parson, Governor of Missouri.[118] According

[112] RSMo 327.011 defines "Responsible Charge" as the independent direct control of a licensee's work and personal supervision of such work pertaining to the practice of architecture, engineering, land surveying, or landscape architecture.
[113] On September 13, 2018, an incident occurred in the Merrimack Valley region of Massachusetts as a result of accidental overpressurization of a low-pressure natural gas system. The natural gas operator, Columbia Gas of Massachusetts, was implementing a cast iron removal project when the incident occurred. The National Transportation Safety Board (NTSB) investigated the incident and determined that the probable cause of the overpressurization of the natural gas distribution system and the resulting fires and explosions was Columbia Gas of Massachusetts' weak engineering management that did not adequately plan, review, sequence, and oversee the construction project that led to the abandonment of a cast iron main without first relocating regulator sensing lines to the new polyethylene main. As a result of this incident, there was one fatality, 22 injuries, and 131 structures were damaged including five homes that were destroyed.
[114] NTSB Accident Report PAR-19/02, *Overpressurization of Natural Gas Distribution System, Explosions, and Fires in Merrimack Valley, Massachusetts, September 13, 2018*, PAR1902.pdf (ntsb.gov).
[115] Page 50 of the NTSB Accident Report, NTSB/PAR-19/02, PB2019-101365, *Overpressurization of Natural Gas Distribution System, Explosions, and Fires in Merrimack Valley, Massachusetts September 13, 2018*; Merrimack Final Report - Corrected Copy-Master.PDF.
[116] Page 34 of NTSB Accident Report PAR-19/02.
[117] Page 48 of NTSP Accident Report PAR-19/02, conclusion number 9.
[118] data.ntsb.gov/carol-main-public/sr-details/P-19-016.

to the NTSB's public tracking of responses to its recommendation P-19-16, it received a response from Governor Parson on January 23, 2020, stating the following:

> … In reviewing the report, it is our understanding that Missouri was included among the 31 states with alleged exemptions because of Section 327 .191 (3) RSMo. However, the interpretation of the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors and Professional Landscape Architects (the state entity that regulates professional engineers) (hereinafter, "Board") is that the statute does not provide for exceptions that such work be performed by professional engineers in this instance.
>
> Specifically, according to the Board, gas distribution is not generally manufacturing and therefore does not fall under the cited exemption. **The Board further states that natural gas infrastructure projects fall into the same category as water and sewer projects, in that they are utilities being built for the public health and welfare. The cited Missouri statute states the exception only exists if it "does not affect the health, safety, and welfare of the public." It is the opinion of the Board that work on gas lines that go into people's homes and businesses affect the health, safety and welfare of the public and therefore requires engineering licensure under current Missouri statute.**
>
> For questions or additional information please contact the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors and Professional Landscape Architects." [Emphasis added.]

2. <u>Spire Actions to Comply:</u>

Spire has attributed the apparent cause of the incident to "Incorrect Operation" with the sub-cause "Equipment Not Installed Properly."[119] Spire stated that ** [redacted] **[120] The forceful ejection of the gripper plug from the pipe resulted in the injury to the worker in this incident.

Design documents issued by Spire for construction of the Holt, Missouri pipeline relocation project (See Confidential Appendix E of this Report) ** [redacted]

[119] Spire's response to Staff data request 0001.
[120] CONF_Attachment 12 to Spire's response to Staff data request 0012.

[redacted][121] [redacted].[122] ** However, in response to a Staff data request asking: "Does Spire's statement: "Furthermore gripper plug installation is not outlined in our company procedure" mean that Spire considers the use of gripper plugs on the Holt Missouri project to have been contrary to Spire procedures?", Spire responded "Yes".[123] The design documents issued for construction on the Holt Missouri pipeline relocation project were not approved or stamped by a licensed professional engineer.[124]

The following have been noted by Spire with respect to the design for the Holt, Missouri pipeline relocation project[125]:

- The gripper plugs identified on design drawings for this project are not intended to be used on any pressurized pipe or pipe connected to a pressurized system.
- The use of gripper plugs is not a part of Spire's standard operating procedures and are not intended for gas usage or steel pipes.
- There was a quarter inch cold rolled longitudinal seam on the inside of the pipe. Staff notes that Spire's ** [redacted] ** Staff further notes that a Williamson Control Fitting was used on the Holt, Missouri pipeline relocation project, and that Spire has stated that the seam did not appear to be raised.[126]

Spire utilized ventilation equipment ("Air handler and vent stacks"[127]) to help draw out any escaping gas getting past the stopple machine. However, there does not appear to be a Spire procedure that addresses the proper use or sizing of the ventilation equipment that Spire was utilizing at the Holt, Missouri project.

In response to a Staff data request asking if Spire's design standard(s), procedure(s) or other policies require that a licensed professional engineer review, approve and seal engineering

[121] Spire's response to Staff data request 0014, Attachment 14D provides the design documents, Spire's response to Staff data request 0001.2 confirms that the purpose of the documents was for use during construction.
[122] Spire's response to Staff data request 0001.3.
[123] Spire's response to Staff data request 0001.1.
[124] Spire response to Staff data request 0011.3.
[125] Based on Staff's review of Spire's Attachment 11.3 provided in response to Staff data request 0011.3
[126] Spire's Response to Staff data request 0001.6.
[127] From Attachment 11.3 to Spire's response to Staff data request 0011.3.

plans developed for its pipe installation and replacement projects, Spire responded: "No, engineering plans are sent to applicable managers and directors in engineering and operations for technical review."[128]

In response to a Staff data request asking if Spire has any standard(s), procedures or other policies pertaining specifically to creating, reviewing and approving a project design, Spire responded: "The Company has work processes. The Company doesn't have any other official standards, procedures, or policies for creating, reviewing, and approving project design"[129].

Spire stated that its Construction Engineering department is responsible for ensuring that design documents for the type of work being performed in Holt, Missouri to relocate the pipeline are consistent with Spire procedures. After construction engineering has reviewed and completed all documents for a project, the work order is sent out for 5-day review to the following departments for consistency with their respective department's standards and/or procedures: ROW, Environmental, Pipeline Safety and Compliance, Field Ops, System Planning, Pressure and Measurement, Gas Control, Pipeline Management, Supply Chain, Safety Management Systems and Workload Planning.[130]

3. Staff Analysis:

At the time the incident occurred, the line pressure of gas in the pipe was estimated by Spire to be 125 psig. Spire's design drawings for the project included gripper plugs that are not intended to be used on pipe connected to a pressurized system.[131] Spire's design of the bypass installed in Holt, Missouri was not reviewed, approved or sealed by a licensed professional engineer.

Staff does not know if the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors and Professional Landscape Architects (the "board") would or would not consider that the design for the work that was performed for the Holt Missouri pipeline relocation project should have been sealed by a licensed professional engineer. Staff seeks Commission approval to refer the matter to the board for its consideration.

[128] Spire response to Staff data request 0037.
[129] Spire response to Staff data request 0037.
[130] Spire's response to Staff data request 0037.1.
[131] Based on Staff's review of Spire's Attachment 11.3 provided in response to Staff data request 0011.3.

4. Violations:

The Commission's pipeline safety rules in 20 CSR 4240-40.030 are silent regarding licensure of pipeline designers. However, based on the response that Governor Parson provided to the NTSB, it appears to Staff that Chapter 327 of the Revised Statutes of Missouri ("RSMo") may have such a requirement. Staff seeks the Commission's approval to refer the matter to the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors and Professional Landscape Architects for its consideration of this matter.

5. Staff Recommendations:

Staff recommends that the Commission authorize its Staff to refer the question as to whether or not Spire has violated provisions of Chapter 327, RSMo to the Board for Architects, Professional Engineers, Professional Land Surveyors and Professional Landscape Architects (APEPLSPLA), including if applicable by filing a complaint[132], and approval to provide an unredacted confidential copy of this report if requested by the Board for APEPLSPLA.

IV. STAFF'S FINDINGS

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

1. Failure to perform appropriate post-incident drug testing of the eight employees whose performance either contributed to the incident or could not be completely discounted as a contributing factor to the incident was a violation of 49 C.F.R. § 199.105(b)(1) as adopted by 20 CSR 4240-40.080. (See *Section III.D, Drug and Alcohol Testing* of this report).

2. Failure to perform appropriate post-incident alcohol testing of the eight employees whose performance either contributed to the incident or could not be completely discounted as a contributing factor to the incident was a violation of 49 C.F.R. § 199.225(a) as adopted by 20 CSR 4240-40.080. (See *Section III.D, Drug and Alcohol Testing* of this report).

[132] Information on the process is provided in the Consumer Complaint Guide: ConsumerComplaintDoc_ARC_2021.pdf (mo.gov).

3. Failure to document reasons for the decision not to test the eight covered employees for drugs was a violation of 49 C.F.R. § 199.105(b)(2) as adopted by 20 CSR 4240-40.080. (See *Section III.D, Drug and Alcohol Testing* of this report).

4. Failure to document reasons for the decision not to test the eight covered employees for alcohol was a violation of 49 C.F.R. § 199.225(a)(2)(i) as adopted by 20 CSR 4240-40.080. (See *Section III.D, Drug and Alcohol Testing* of this report).

5. Failure to follow Spire's written qualification program with regards to communication of changes that affect covered tasks was a violation of 20 CSR 4240.030(12)(D)3. Specifically, Spire did not communicate to its employees and contractors that ** [redacted]. ** (See *Section III.G, Operator Qualification* of this report).

V. STAFF'S RECOMMENDATIONS

In summary, 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 provide a final listing of corrective actions identified by Spire during its PIR and root cause analysis investigations to the Commission. For each identified corrective action item Staff recommends that Spire provide either the date the corrective action item was completed or a timeline for completion (See *Section III.B, Investigation of Failures and Incidents* of this report).

2. Staff recommends that Spire provide quarterly updates to the Commission regarding the status of implementation of each corrective action. If any identified corrective action item is no longer being considered as required by Spire, the reason(s) should be explained in the quarterly updates (See *Section III.B, Investigation of Failures and Incidents* of this report).

3. Staff recommends that Spire develop procedures that address the following:

    - Establish who within Spire is responsible for determining which employees (including employees of contractors working for Spire) are to be tested following an incident.

- Establish a time-frame for making the determination whether or not to test employees following an incident. Staff recommends that this be done within two hours to meet the time requirements for alcohol testing. If it will be difficult for Spire to make this determination within two hours following an incident, Staff recommends that Spire adopt a policy that all employees working at an incident location be tested.
- Provide instructions for how and where specimens are to be collected following an incident. This should address the contingency that employees (including employees of contractors working for Spire) are working outside of their normal service area(s).
- Provide instructions for how specimens are to be collected, and by whom for hospitalized employees.

(See *Section III.D, Drug and Alcohol Testing* of this report).

4. Staff recommends that Spire include in its written agreements with its contractors that perform covered functions on Spire's pipelines provisions to:

   - Require that specimens be collected for drug and alcohol testing from each employee identified by Spire within two hours of a federally reportable incident.
   - Require that each contractor either develop or adopt the procedures recommended for Spire above.
   - Include the requirements of 49 C.F.R. §§ 199.115 and 199.245 that the contractor allows access to property and records by Spire, the Administrator, any DOT agency with regulatory authority over the operator or covered employee, and representatives of the Missouri Public Service Commission for the purposes of monitoring the operator's compliance with the requirements of 49 C.F.R. Part 199 as adopted in 20 CSR 4240-40.080.

   (See *Section III.D, Drug and Alcohol Testing* of this report).

5. Staff recommends that Spire to amend its plans and procedures regarding tapping, stopping, and capping operations similar to those required by the project in Holt, MO, to include detailed processes that can be followed to produce safe, repeatable results when conducting these operations. Amendments should include, but not be limited to:

- All sub-processes that could be utilized during tapping and stopping procedures as they relate to safety (such as “air-jacking”, lock-out tag-out, or other such sub-processes), including detailed methodology and when it is and is not approved to use the sub-process;
- Information about which specific valves and equipment are subject to the lock-out, tag-out procedures and sub-processes; and
- How to determine qualification requirements in order to verify qualified individuals are performing any covered tasks.

Staff further recommends that any relevant changes to Spire procedures with regards to safety during these operations be written as required processes (e.g., “shall” or “must” instead of “should” language) (See *Section III.E, Hot Tapping and Stopping* of this report).

6. Staff recommends that if Spire intends to utilize a lockout tagout process during tapping, stopping, and venting operations that Spire develop a written lockout tagout procedure to be put into effect during those processes and that written procedure include, but is not limited to:
    - Details on personnel authority for completing a lockout and/or tagout including determination of whom has the authority to do so;
    - Details on personnel authority for releasing a lockout and/or tagout including determination of whom has the authority to do so;
    - Details on whether a lock or a tag, or a lock and a tag will be utilized in these processes and specifically how the lock and/or tag will prevent unauthorized operation of equipment;
    - Details on how Spire will train employees and contractors on how to put the lockout tagout procedure into effect and what training or qualifications will be required to obtain the authority to lockout or tagout equipment and release a lockout or tagout; and
    - Details on how Spire will train all of its employees and contractors on how to recognize when equipment has been locked and/or tagged out, and how to

recognize who has the authority to release a locked or tagged out piece of equipment.

(See *Section III.E, Hot Tapping and Stopping* of this report.)

7. Staff recommends that Spire review its procedures and practices for prevention of accidental ignition during the work activities that were involved in this incident and make revisions to prevent recurrence of this incident and the near-miss of an accidental ignition in an occupied excavation. These revisions should ensure the use of a gripper plug is not allowed going forward and that only acceptable methods for gas pipeline isolation, such as double block and bleed[133] stopple fittings, are used going forward to address concerns with gas bleeding past a stopple fitting (See *Section III.F, Prevention of Accidental Ignition* of this report).

8. Staff recommends that Spire follow its procedure with respect to changes to covered tasks performed on its pipelines. Additionally, Staff recommends that for each change in a procedure that can potentially affect a covered task, the procedure should be updated to address:
   A. Communication of the change(s) to the persons responsible for design and planning of these covered tasks; and
   B. Including evaluation criteria regarding the changes in the testing criteria for qualification or re-qualification on the affected covered tasks.

   (See *Section III.G, Operator Qualification* of this report).

9. Staff recommends that Spire implement the changes to its DIMP Plan as outlined in Spire's response to Staff data request 0010, part E, specifically to ** [redacted].** (See *Section III.H, Distribution Integrity Management Program ("DIMP")* of this report).

[133] "Double block and bleed" refers to a method of isolation that involves closing two valves (or plugging heads in the case of a stopple fitting) to create a barrier between the source of hazard and a break of containment. A bleed valve located between the two block valves is used to bleed any pressure that may build up in the space between the block valves.

10. Staff recommends that Spire conduct a DIMP program re-evaluation including the changes outlined in Spire's response to Staff data request 0010, part E, in order to determine the relative risk of each threat including sub-threats within the threat category of incorrect operations. Additionally, as part of the DIMP program re-evaluation, Staff recommends that Spire ensures that it determines if any measures to address the risk posed by incorrect operations are necessary to reduce the risk posed to its pipeline (See *Section III.H, Distribution Integrity Management Program ("DIMP")* of this report).
11. Staff recommends that Spire communicate procedural changes such as ** [redacted] ** to its Inspection Contractors (See *Section III.I, Oversight of Contractors* of this report).
12. Staff recommends that the Commission authorize its Staff to refer the question as to whether or not Spire has violated provisions of Chapter 327, RSMo for consideration by the Board for Architects, Professional Engineers, Professional Land Surveyors and Professional Landscape Architects (APEPLSPLA), including if applicable by filing a complaint[134] and to provide an unredacted confidential copy of this report in support of its complaint if requested by the Board for APEPLSPLA (See *Section III.J, Project Design* of this report).

Staff recommends that the Commission order Spire to file an action plan, by February 28, 2025, which addresses the recommendations (numbered 1-11). Staff further recommends that the Commission order Spire to include in its action plan filing when it will effectuate that action plan. Finally, Staff recommends:

1. The Commission require that the action plan include Spire's proposed resolution for addressing each recommendation and the timeframe for implement the resolution.
2. The Commission require Spire to file updates every six months as to how the plan has been effectuated.

If for any recommendation Spire believes no action is necessary, Staff recommends the Commission order Spire to explain, and provide supporting documentation as available, the reason(s) Spire believes no action is required.

[134] Information on the process is provided in the Consumer Complaint Guide: ConsumerComplaintDoc_ARC_2021.pdf (mo.gov).

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of an Investigation into Spire Missouri Inc. d/b/a Spire Concerning a Natural Gas Incident in Holt, Missouri	)))	Case No. GS-2024-0137

AFFIDAVIT OF JASON DICKNEITE

STATE OF MISSOURI	)	
	)	ss.
COUNTY OF COLE	)	

COMES NOW JASON DICKNEITE and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Staff's Gas Incident Report*; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

Jason Dickneite

JASON DICKNEITE

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 20th day of November 2024.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: April 04, 2025
Commission Number: 12412070

D Suzie Mankin

Notary Public

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of an Investigation into Spire Missouri Inc. d/b/a Spire Concerning a Natural Gas Incident in Holt, Missouri	)))	Case No. GS-2024-0137

AFFIDAVIT OF CLINTON L. FOSTER

STATE OF MISSOURI)
) ss.
COUNTY OF Jackson)

COMES NOW CLINTON L. FOSTER and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Staff's Gas Incident Report*; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

CLINTON L. FOSTER

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Jackson, State of Missouri, at my office in Kansas City, on this 18th day of November 2024.

CHERYL LEVERETTE
MY COMMISSION EXPIRES
9-7-2027
NOTARY SEAL
#01404338
JACKSON COUNTY
NOTARY PUBLIC, STATE OF MISSOURI

Notary Public

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of an Investigation into Spire Missouri Inc. d/b/a Spire Concerning a Natural Gas Incident in Holt, Missouri	)))	Case No. GS-2024-0137

AFFIDAVIT OF JOHN D. KOTTWITZ

STATE OF MISSOURI	)	
	)	ss.
COUNTY OF COLE	)	

COMES NOW JOHN D. KOTTWITZ and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Staff's Gas Incident Report*; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

John D. Kottwitz

JOHN D. KOTTWITZ

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 20th day of November 2024.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: April 04, 2025
Commission Number: 12412070

D Suzie Mankin

Notary Public

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of an Investigation into Spire Missouri Inc. d/b/a Spire Concerning a Natural Gas Incident in Holt, Missouri	)))	Case No. GS-2024-0137

AFFIDAVIT OF KATHLEEN A. McNELIS, PE

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW KATHLEEN A. McNELIS, PE and on her oath declares that she is of sound mind and lawful age; that she contributed to the foregoing *Staff's Gas Incident Report*; and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

KATHLEEN A. McNELIS, PE

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 20th day of November 2024.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: April 04, 2025
Commission Number: 12412070

Notary Public