National Transportation Safety Board
Office of the Chair
Washington, DC 20594

July 6, 2023

US Department of Transportation
Docket Management System
West Building, Ground Floor, Room W12-140
1200 New Jersey Ave., SE
Washington, DC 20590-0001

Attention: Docket No. PHMSA-2021-0039

Dear Sir or Madam:

The National Transportation Safety Board (NTSB) has reviewed the Pipeline and Hazardous Materials Safety Administration's (PHMSA's) notice of proposed rulemaking (NPRM) titled, "Pipeline Safety: Gas Pipeline Leak Detection and Repair," published at 88 *Federal Register* 31890 on May 18, 2023. The NPRM proposes to amend portions of Title 49 *Code of Federal Regulations* (*CFR*) Parts 191, 192, and 193 to implement congressional mandates in the Protecting our Infrastructure of Pipelines and Enhancing Safety Act of 2020 to reduce methane emissions from new and existing gas transmission pipelines, gas distribution pipelines, regulated gas gathering pipelines, underground natural gas storage facilities, and liquefied natural gas facilities.

In its NPRM, PHMSA documented a detailed evaluation of several of its regulations and proposed amendments to:

- strengthen leakage survey and patrolling requirements;
- establish performance standards for advanced leak detection programs;
- clarify leakage survey, investigation, and repair personnel qualification requirements; and
- codify congressional mandates in federal regulation.

Some of PHMSA's proposed amendments, if implemented, will help improve pipeline leak detection and mitigation, an item on the NTSB's Most Wanted List for

2021–2023.[1] The NTSB first identified the need for leak detection and mitigation methods about 50 years ago and is encouraged by proposals in the NPRM that may enhance the industry's performance in detecting and safely responding to pipeline leaks. We offer comments in the following topic areas: leakage survey requirements and advanced leak detection programs, in-home methane detectors, leak-prone materials, and leak detection systems.

Leakage Survey Requirements and Advanced Leak Detection Programs

In February 2018, the NTSB investigated a natural gas-fueled explosion that destroyed a home in Dallas, Texas.[2] The accident killed one resident and injured four others. In the 2 days before the explosion, two gas-related incidents—each resulting in second-degree burns to an occupant and significant structural damage—occurred on the same block at homes that were served by the same natural gas main. The NTSB determined that a crack in the natural gas main allowed gas to leak into the surrounding environment for an extended period of time. Although the pipeline operator's leak investigation before the accident included the area where the crack occurred, the operator did not detect natural gas at this location.

Heavy rains—weather that was not unusual for the region—had occurred 2 days before the explosion. The NTSB found that the pipeline operator's wet weather leak investigation procedures were insufficient given the known limitations of its equipment in wet conditions. We also found that although the pipeline operator's leakage survey methodology and frequency complied with minimum federal requirements, they did not identify the degraded state of the operator's natural gas distribution system. This degradation was evidenced by more than 1,000 Grade 1 and 2 leaks that the pipeline operator found in leakage surveys after the accident. The NTSB further noted that the first step in an effective leak management program is to locate leaks in the system. Once the leak locations are known, the pipeline operator must thoroughly investigate and repair them in a timely manner to ensure public safety.

The Dallas accident demonstrated the importance of sufficient leakage survey frequencies, methodologies, and performance standards for leak detection equipment and procedures. It also demonstrated that compliance with the minimum federal requirements for periodic leakage surveys is not enough to identify hazardous leaks.

In the NPRM, PHMSA proposes to introduce an advanced leak detection program performance standard that would require pipeline operators to demonstrate that their leak detection equipment, procedures, and analytics can detect all leaks

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[1] https://www.ntsb.gov/Advocacy/mwl/Pages/default.aspx

[2] For more information, see *Atmos Energy Corporation Natural Gas-Fueled Explosion, Dallas, Texas, February 23, 2018*. NTSB/PAR-21/01. Washington, DC: NTSB.

above a minimum threshold.[3] PHMSA also proposes to require increased leakage survey frequencies. PHMSA reports in the NRPM that a reasonably prudent operator will already have qualified personnel completing more frequent leakage surveys than the minimum federal safety standards require, using commercially available advanced leak detection equipment. Indeed, the NTSB agrees with this assessment and supports PHMSA's efforts to require all pipeline operators be held to the same safety standard.

In-Home Methane Detectors

Although pipeline operators may discover or be alerted to leaks through various activities, such as maintenance or odor complaints, these strategies will not consistently locate all hazardous leaks. When natural gas migrates through the soil into a home, the odorant may be stripped from the gas, and the resident would not be aware of the need to evacuate and alert the pipeline operator.[4] In-home methane detectors are one method of continuous monitoring that can help pipeline operators identify leaks and improve safety performance.

In August 2016, the NTSB investigated a building explosion and fire that partially collapsed a 14-unit apartment building in Silver Spring, Maryland.[5] As a result of the accident, 7 residents died, and 68 others were injured. The explosion was caused by the failure of an indoor mercury service regulator with an unconnected vent line that allowed natural gas to leak into and accumulate in the basement.[6] In-home methane detectors could have helped mitigate the consequences of the Silver Spring accident by alerting residents to the leak and giving them time to evacuate and call 9-1-1. As a result of the investigation, we made the following safety recommendations to the International Code Council and to the National Fire Protection Association (NFPA), respectively:

> In coordination with the Gas Technology Institute and the National Fire Protection Association, incorporate provisions in the International Fuel Gas Code that requires methane detection systems for all types of residential occupancies with gas service. At a minimum, the provisions

[3] In the NPRM, PHMSA further states that the proposed requirement for an advanced leak detection program with performance standards for leak detection procedures and equipment addresses the findings from our investigation of the Dallas explosion. See 88 *Federal Register* 31935.

[4] Because natural gas is odorless, strong-smelling chemical additives called *odorants* are mixed with natural gas before distribution to help reduce the risk that leaks will go unidentified.

[5] For more information, see *Building Explosion and Fire, Silver Spring, Maryland, August 10, 2016*. NTSB/PAR-19/01. Washington, DC: NTSB.

[6] The *vent line* was a pipe designed to direct natural gas outside of the building if the system was overpressurized.

should cover the installation, maintenance, placement of the detectors, and testing requirements. (P-19-6)[7]

In coordination with the Gas Technology Institute and the International Code Council, revise the National Fuel Gas Code, National Fire Protection Association 54 to require methane detection systems for all types of residential occupancies with gas service. At a minimum, the provisions should cover the installation, maintenance, placement of the detectors, and testing requirements. (P-19-7)[8]

The NTSB reiterated these recommendations as a result of our investigation of the Dallas, Texas, accident. Had methane detectors been installed at the three Dallas homes affected by the natural gas main leak, occupants could have been alerted to the leak and had time to evacuate.

In the NPRM, PHMSA states that it encourages the adoption of in-home methane detectors and invites comments on the value of requiring these and other continuous monitoring systems. Although pipeline operators were not the recipients of recommendations P-19-6 and P-19-7, both the Silver Spring and Dallas NTSB investigations demonstrated the potential safety value of continuously monitoring the atmosphere by using in-home methane detectors. Recognizing that such devices can provide early warning of jurisdictional gas leaks, some pipeline operators are installing them in buildings that receive natural gas service.[9] The NTSB urges PHMSA to consider in its final rule how in-home methane detector technology may be incorporated into pipeline operators' leak management programs.

Leak-Prone Materials

In July 2017, the NTSB investigated a natural gas–fueled explosion that destroyed a home in Millersville, Pennsylvania, and significantly damaged six others. The accident killed one person and injured three others. In a safety recommendation report related to this investigation, the NTSB concluded that referencing the use of external sources of information in PHMSA's Distribution Integrity Management: Frequently Asked Questions would help pipeline operators recognize and better understand how to reduce potential accidents.[10] We continue to believe that external

[7] Safety Recommendation P-19-6 is currently classified Open—Acceptable Response based on the development of NFPA 715, "Standard for the Installation of Fuel Gases Detection and Warning Equipment," for reference in the International Fuel Gas Code.

[8] Safety Recommendation P-19-7 is currently classified Open—Acceptable Alternate Response based on the pending incorporation of NFPA 715 into NFPA 54 or other appropriate code.

[9] "In-Home Methane Leak Detection: A Case Study" (paper presented at the Pipeline Safety Trust Conference, December 2022). For more information, see https://pstrust.org/2022-conference, accessed June 6, 2023.

[10] (a) For more information, see *Safety Recommendation Report, Installation of PermaLock Mechanical Tapping Tee Assemblies*. NTSB/PSR-18/01. Washington, DC: NTSB. (b) The document

sources of information are useful to pipeline operators when identifying threats to pipeline integrity, including leak-prone materials.

Similarly, joint government–industry efforts, such as the status reports produced by the Plastic Pipe Database Committee, can assist pipeline operators in identifying leak-prone materials.[11] Additionally, pipeline operators can use operator-provided information contained in PHMSA's pipeline incident and annual reports to evaluate their systems' susceptibility to leaks. Pipeline operators can proactively identify leak-prone materials using these resources as well as their system knowledge and operational experience.

The NTSB made the following safety recommendation to PHMSA as a result of the Dallas, Texas, investigation:

> Evaluate industry's implementation of the gas distribution pipeline integrity management requirements and develop updated guidance for improving their effectiveness. The evaluation should specifically consider factors that may increase the likelihood of failure such as age, increase the overall risk (including factors that simultaneously increase the likelihood and consequence of failure), and limit the effectiveness of leak management programs. (P-21-2)[12]

In the NPRM, PHMSA invites comments on the value of explicitly listing leak-prone materials, either in 49 *CFR* Part 192 or in periodically issued implementing guidance. PHMSA notes that pipeline operators could reference authoritative resources—state pipeline safety regulatory actions, PHMSA pipeline failure investigation reports and advisory bulletins, and NTSB findings, for example—to help identify pipeline materials known to leak. To the extent these references are publicly available, the NTSB agrees that they are valuable resources that can help pipeline operators identify leak-prone materials.[13]

Distribution Integrity Management: Frequently Asked Questions can be found at https://www.phmsa.dot.gov/pipeline/gas-distribution-integrity-management/gas-distribution-integrity-management-faqs.

[11] The Plastic Pipe Database Committee coordinates the creation and maintenance of a database to proactively monitor the performance of plastic pipe and metal and plastic appurtenances contained within plastic piping systems. Organizations represented on the Plastic Pipe Database Committee include the American Gas Association, American Public Gas Association, Plastics Pipe Institute, National Association of Regulatory Utility Commissioners, National Association of Pipeline Safety Representatives, PHMSA, and the NTSB.

[12] Safety Recommendation P-21-2 is currently classified Open—Acceptable Response based on PHMSA's ongoing evaluation of the industry's implementation of gas distribution integrity management program requirements.

[13] The availability of state pipeline safety regulatory actions varies from state to state, and many PHMSA pipeline failure investigation reports are not readily available to the public.

Although PHMSA-issued advisory bulletins and implementing guidance are helpful resources, they cannot replace pipeline operators' responsibility to identify threats and safely operate their systems. The NTSB believes that PHMSA's ongoing work in response to Safety Recommendation P-21-2 will better position pipeline operators to identify leak-prone materials.

Leak Detection Systems

In September 2010, the NTSB investigated a natural gas transmission pipeline rupture and fire in San Bruno, California, that destroyed 38 homes and damaged 70 others, killing 8 people and injuring 58.[14] The pipeline operator's excessively long response time—it took 95 minutes to stop the flow of gas and isolate the rupture—contributed to the extent and severity of property damage and increased the life-threatening risks to residents and emergency responders. As a result of the investigation, we made the following safety recommendation to PHMSA:

> Require that all operators of natural gas transmission and distribution pipelines equip their supervisory control and data acquisition [SCADA] systems with tools to assist in recognizing and pinpointing the location of leaks, including line breaks; such tools could include a real-time leak detection system and appropriately spaced flow and pressure transmitters along covered transmission lines. (P-11-10)[15]

PHMSA previously indicated that the leak detection provisions of this recommendation, specifically requiring operators to add leak detection tools to SCADA systems, would be best addressed in this NPRM.[16] However, the NPRM does not propose to require operators to equip their SCADA systems with tools to assist in recognizing and pinpointing the location of leaks, including line breaks in transmission lines. By decreasing the amount of time it takes to isolate a leak or rupture and thus the volume of gas released, such tools can help reduce risks to the public and the environment. The NTSB encourages PHMSA to revisit this topic to satisfy the intent of Safety Recommendation P-11-10 in its final rule.

The NTSB is pleased to see PHMSA publish this NPRM, and we look forward to the issuance of the final rule. We believe that the modifications to the NPRM suggested above will increase safety and be responsive to several of our recommendations. We commend the agency for initiating a rulemaking that may improve pipeline leak detection and mitigation.

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[14] For more information, see *Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire, San Bruno, California, September 9, 2010*. NTSB/PAR-11/01. Washington, DC: NTSB.

[15] This recommendation is currently classified Open—Acceptable Alternate Response based in part on pending publication of this NPRM.

[16] Letter from PHMSA Deputy Administrator to NTSB Chair, dated January 14, 2022.

Thank you for the opportunity to comment on this notice.

Sincerely,

[Original Signed]

Jennifer Homendy
Chair