



DIVERSIFIED
energy



Pipeline Emissions & PHMSA NPRM

PHMSA-2021-0039

Pipeline Safety: Gas Pipeline Leak Detection and Repair

Leak Surveys

New and enhanced requirements for leakage surveys and pipeline patrolling for operators of gas distribution, transmission, offshore gas gathering, and Type A, Type B, and Type C onshore gathering pipelines.

Leakage surveys **must** be conducted using leak detection equipment and in accordance with new **advanced leak detection program (ALDP)** requirements proposed in § 192.763. Leaks must be remediated in accordance with leak grading and repair requirements proposed in new § 192.760.

Leaks **must** be remediated in accordance with leak grading and repair requirements proposed in new § 192.760.

Leakage Surveys – Gas Transmission and Gathering.



Increase the frequency of leakage surveys on gas transmission and gas gathering pipelines located in high consequence areas (HCA) and aboveground offshore gas transmission and onshore gas gathering pipelines.



Leak survey requirements would be extended to Type C onshore gas gathering pipelines.

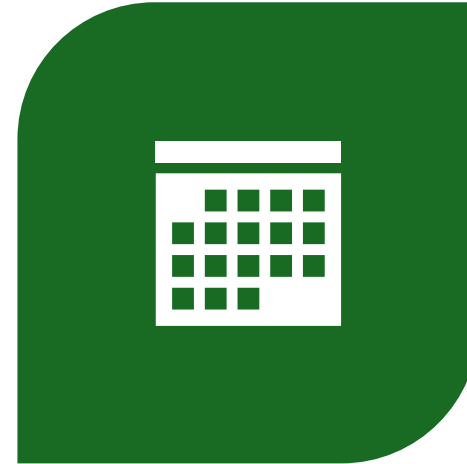


Reliance on human senses for leakage surveys would be limited to submerged offshore gas transmission and gathering pipelines, and, subject to notification and review by PHMSA, onshore gas transmission and regulated onshore gas gathering pipelines in Class 1 and Class 2 locations outside of HCAs.

Patrolling – Gas Transmission and Gathering



INCREASE THE PATROLLING FREQUENCY FOR GAS TRANSMISSION, OFFSHORE GATHERING AND TYPE A ONSHORE GAS GATHERING AND ESTABLISH NEW PATROLLING REQUIREMENTS FOR TYPE B AND TYPE C ONSHORE GAS GATHERING PIPELINES.



THE NPRM PROPOSES A UNIFORM FREQUENCY OF **12 PATROLS** ALONG AN ENTIRE PIPELINE EACH CALENDAR YEAR.

Operator Qualification

- Proposed § 192.769 would clarify that leakage surveys and investigations are “covered tasks,” which means that personnel performing these activities must be qualified under operator qualification regulations.

Advanced Leak Detection Program

- The NPRM would require that operators of gas distribution, transmission, offshore gathering, and Type A, Type B, and Type C gathering pipelines implement written ALDPs and establish performance standards for the sensitivity of leak detection equipment and the effectiveness of their ALDPs.



ALDP- Element 1- Leak Detection Equipment

- ALDPs must list the leak detection equipment used for leakage surveys, leak investigations, and pinpointing leaks.
- Leak detection equipment must have a minimum sensitivity of 5 parts per million (ppm) or less.
- Operators would select their leak detection equipment based on a documented analysis that considers the gas transported, the size, configuration, operating parameters, and operating environment of the system.

ALDP Element 2- Leak Detection Procedures

- An ALDP must have procedures for performing compliant leakage surveys for the leak detection equipment included in the ALDP, including procedures for validating that a leak detection device meets the minimum sensitivity requirement and investigating and pinpointing the location of all leak indications.



ALDP- Element 3- *Prescribed Leakage Surveys.*

- An ALDP must state the frequency of leakage surveys and must meet minimum frequencies stated in § 192.723 for gas distribution pipelines and § 192.706 for gas transmission, offshore gathering, and Type A, Type B, and Type C gathering pipelines.



ALDP- Element 4- *Program Evaluation and Improvement.*

- At least annually, operators would be required to re-evaluate their ALDPs considering, at a minimum, the performance of leak detection equipment, the adequacy of leakage survey procedures, advances in leak detection technologies and practices, the number of leaks initially detected by third parties, the number of leaks and incidents on the pipeline, and estimated emissions from detected leaks.

Leak Grading and Repair Requirements



Require that operators of gas distribution, transmission, offshore gathering, and Type A, Type B, and Type C gathering pipelines develop written procedures to implement proposed new and enhanced requirements for grading and repairing any leak detected on all pipeline components.



Leak repair requirements would no longer apply only to leaks “hazardous” to public safety.



The NPRM also would codify the requirement in § 114 of the 2020 PIPES Act that operators update their procedures to provide for minimizing releases of natural gas, eliminate hazardous leaks of natural gas and any other flammable, toxic, or corrosive gas; and replace or remediate pipelines known to leak.

Definition of Leak or Hazardous Leak

- Proposes to define a “leak or hazardous leak” as “any release of gas from a pipeline that is uncontrolled at the time of discovery and is an existing, probable, or future hazard to persons (including operating personnel), property, or the environment, or any uncontrolled release of gas from a pipeline that is detectable via equipment, sight, sound, smell, or touch.”

New Leak Grading Framework

- **Grade 1 Leaks-** Grade 1” leaks present an urgent or emergency situation requiring that the operator take “immediate and continuous” action to eliminate the hazards to people or the environment. The NPRM proposes to characterize a Grade 1 leak to include leaks with “grave” environmental harms. In this respect, the NPRM distinguishes between public safety risks which can be “existing or contingent” under existing GPTC guidance, and the “certain” environmental harms caused by leaks of methane and other gas. The NPRM classifies the following as a Grade 1 leak: (1) any reading of 80% lower explosive limit (LEL) or higher in a substructure from which gas would likely migrate to the outside wall of a building; (2) any leak that can be seen, heard, or felt; and (3) any leak reportable as an incident under Part 191 of the pipeline safety regulations.
- **Grade 2 Leaks-** a leak presenting a probable future hazard to public safety or a significant hazard to the environment. Grade 2 is the minimum priority grade for leaks of gaseous hydrogen and for any leak on a gas transmission pipeline or a Type A or Type C onshore gas gathering pipeline. A Grade 2 leak also includes any leak other than a Grade 1 leak with a leakage rate of 10 CFH or more. An operator would be required to repair a Grade 2 leak within six months of detection, unless the leak is from a gas transmission or Type A gathering pipeline lying in an HCA or in a Class 3 or Class 4 location, in which case it would have to be repaired within 30 days of detection. An operator’s procedure must contain a methodology for prioritizing Grade 2 leak repairs.
- **Grade 3 leaks-** any leak that is not a Grade 1 or a Grade 2 leak be classified as a Grade 3 leak. All Grade 3 leaks must be repaired within 24 months of detection and be re-evaluated once every six months until repair is complete. In order to accommodate ongoing pipe replacement programs, the NPRM would provide that a Grade 3 leak may be monitored rather than repaired if the pipeline on which the leak is detected is scheduled for replacement or abandonment within five years of the date the leak is detected.

Large-Volume Gas Release Reports

Proposes to amend Part 191 to require that operators all jurisdictional gas pipeline facilities, including underground natural gas storage facilities, LNG facilities and Type R gas gathering pipelines, report large volume releases, including intentional releases (e.g., blowdowns, maintenance-related venting, pressure relief device actuation) and unintentional releases (e.g., leaks, fugitive emissions) of **1 MMCF or greater**.

This requirement would not apply to certain events that are reported as incidents.



Annual Reports

- Require operators of distribution, gas transmission, offshore gathering, and Type A, Type B, and Type C gathering (but not Type R gathering) to report the number of leaks detected and repaired by grade, the number (by grade) of unrepaired leaks, and the estimated aggregate emissions from leaks by grade and other emissions by source category.
- The NPRM proposes to remove language in the annual report form instructions that suggests that releases that can be eliminated by routine maintenance need not be reported as leaks.

Minimizing Vented Gas Emissions



Require that gas transmission, offshore gathering, and Type A onshore gas gathering pipelines minimize intentional venting of natural gas and flammable, toxic, or corrosive gas emissions.



Proposed new § 192.770 would list examples of approved methods to mitigate or prevent such vented releases.



An operator would not be required to comply with these measures during an event that requires activation of the operator's emergency plan if such minimization would delay emergency response or result in a safety risk during pipeline assessments or maintenance.

192.770- proposed methods for emission reduction during venting or blowdown

- Isolating the smallest section of the pipeline necessary to complete the task by use of valves or the installation of control fittings;
- Routing gas released from the pipeline from the nearest isolation valves or control fittings to a flare or to other equipment as fuel gas;
- Reducing pressure by use of inline compression;
- Reducing pressure by use of mobile compression to a segment or storage vessel adjacent to the nearest isolation valves;
- Transferring the gas to a segment of a lower pressure pipeline system adjacent to the nearest isolation valves; or
- Employing an alternative method demonstrated to result in a release volume reduction of at least 50% compared to venting gas directly to the atmosphere without mitigative action.
- An operator is not required to comply with the provisions of paragraph (a) of this section during an event that activates its emergency plan under § 192.615(a)(3) when such minimization would delay emergency response or result in a safety risk during pipeline assessments or maintenance. Each emergency release conducted without mitigation must be documented, including the justification for release without mitigation.
- Operators must document the methodologies used in paragraph (a) of this section and describe how the methodologies minimize

Design, Configuration, and Maintenance of Pressure Relief Devices

- Revise § 192.199 to require that new and replaced, relocated, or otherwise changed gas transmission, distribution, and part 192-regulated gathering pipelines be designed and configured, as demonstrated by documented engineering analysis, to minimize unnecessary releases of gas.
- Proposed § 192.773 would require that these operators develop procedures to assess the proper function of pressure relief devices on their facilities and remediate or replace any malfunctioning devices.
- Proposed § 192.773 also identifies **specific actions** operators would be required to take in response to a malfunctioning pressure relief device, including immediate repair or replacement in certain circumstances.

192.773 Pressure relief device maintenance and adjustment of configuration.

- a) Each operator must develop, maintain, and follow written operations and maintenance procedures to assess the proper function of pressure limiting or relief device and to repair or replace each failed pressure limiting or relief device
 - (1) Assess the pilot, springs, seats, pressure gauges, and other components to ensure proper functioning, sensing, and set/reset actuation pressures are within actuation pressure tolerances;
 - (2) Assess the inlet and outlet piping for piping that restricts the inlet or outlet gas flow, piping that restricts the sensing pressure, debris, and other restrictions that could impede the operation or restrict the capacity to relieve overpressure conditions;
 - (3) Repair or replace the device to eliminate the malfunction as follows: (i) If a pressure relief device activates above its set pressure and above the pressure limits in § 192.201(a) or 192.739 as applicable, fails to operate, or otherwise fails to provide overpressure protection, the operator must repair or replace the device or pressure sensing equipment immediately. (ii) If a pressure relief device allows gas to release to the atmosphere at an operating pressure below the set actuation pressure range, the operator must take immediate and continuous action with on-site personnel to stop the release until the device is repaired or replaced.
- The relief device or pressure sensing equipment must be repaired or replaced as soon as practicable but within 30 days.
- (b) Each operator must develop, maintain, and follow written operations and maintenance procedures to ensure that a pressure relief device configuration, as demonstrated by a documented engineering analysis, employs set and reset actuation pressures ensuring minimization of release volumes while providing adequate overpressure protection.
- (c) Records under this section must be maintained as follows: (1) Records of relief devices malfunctions must be maintained for 5 years after repair or replacement. (2) Records pertaining to repair, replacement, or reconfiguration (including any engineering analyses) of a pressure relief device must be maintained for the life of the pipeline.

NPMS

- Revise § 191.29 National Pipeline Mapping System. (a) Each operator of a gas transmission pipeline, offshore gathering, Type A, Type B, or Type C regulated onshore gathering pipeline as determined in § 192.8 of this subchapter, or liquefied natural gas facility must provide the following geospatial data to PHMSA for that pipeline or facility:

Where we stand



TWO GAS PIPELINE ADVISORY
COMMITTEE (GPAC) MEETINGS IN
NOVEMBER 2023 AND MARCH 2024.



MEMBERS FROM GOVERNMENT,
INDUSTRY AND PUBLIC DISCUSS,
MAKE MODIFICATIONS, AND VOTE.



PHMSA CONSIDERS
RECOMMENDATIONS AND MOVES
TOWARD FINAL RULEMAKING.

GPAC Recommendations- Leak surveys

Transmission

- HCA class 1, 2, or 3 Twice a year not to exceed 7 1/2 months.
- HCA class 4 Four times a year not to exceed 4 1/2 months.

Gathering Types A, B & C

- Annual: > 16 inches in outside diameter, or 8 inches to 16 inches in diameter if the segment contains a building intended for human occupancy or other identified site within the potential impact radius or class location unit.
- Five (5) years: All other type C gathering lines.

GPAC Recommendations- Patrols



Transmission

6 times each calendar year at intervals not exceeding 75 days for Class 3 and 4 locations, and a patrol frequency revised to 4 times each calendar year in Class 1 and 2 locations.



Gathering

Applies to Gathering Type A

GPAC Recommendations- ALDP

- Pipeline: 10 kg/hr flow rate standard for screening surveys; follow up investigation of leak indications with handheld equipment (5 ppm, 5 ppm-m, or 1% LEL) to pinpoint the source of the leak, or
- Leakage survey with handheld or mobile equipment (5 ppm, or ppm-m).
- Recommend Probability of Detection standard for all flow-rate based advanced leak detection technology: 90%
- Aboveground appurtenances: Optical Gas Imaging (consistent with EPA)
- Clarify that the scope of the alternative performance standard process in §§192.18 and 192.763(c) covers all gas transmission and regulated gas gathering pipelines.

GPAC Recommendations- Leak Grading

- Grade 1 Leaks-
 - Clarify the “seen, heard, or felt criteria” (b)(1)(vii) consistent with the GPTC guide language. GPTC: “Any leak that can be seen, heard, or felt, and which is in a location that may endanger the general public or property.”
 - The GPAC recommends PHMSA clarify the meaning of grave environmental hazard or provide more clarity on what conditions pose a grave environmental hazard. Modify the Grade 1 leak criteria to include those leaks equal to or greater than 100 kg/hr.
- Grade 2 Leaks-
 - Modifying grade 2 leak requirements to include:
 - Any reading of gas that does not qualify as a grade 1 leak that occurs in the pipe body of a transmission pipeline or a regulated gas gathering line operating at high stress (greater than 30% SMYS), o A transmission pipeline or regulated gas gathering line leak measured to be greater than an appropriate volume threshold for a transmission or regulated gathering line [such as 5-10 kg/hr]
 - Repair grade 2 leaks as soon as practicable considering impacts to customers and environmental concerns, but not to exceed one year.

GPAC Recommendations- Leak Grading

- Grade 3 Leaks-
 - Revise general repair timeline from 24 months to 36 months
 - HCA and Class 3&4 gas transmission lines: 1 year

Large Volume gas release reporting



Revise the total volume criteria from 1 MMCF to 0.5 MMCF within 4 days, or



100 kg/hr flow-rate.



Establish a reporting timeline of quarterly.

Minimizing vented gas emissions

- PHMSA should create an exception to §192.770 for non-emergency blowdowns with a de minimis volume consistent with the principles outlined below and considering available data on releases from blowdowns.
 - The GPAC recommends this section address blowdowns of large-diameter pipeline segments but exclude de minimis emissions, including:
 - blowdowns of launchers and receivers that may not be within the confines of a compressor station;
 - blowdowns from work on measurement and regulation stations;
 - blowdowns from maintenance work on compressor units and associated equipment including relief systems and filter separators;
 - Blowdowns to conduct an immediate anomaly repair and excavation; and
 - ESD testing as relevant.
 - add an exception for when there would be a significant negative impact to customers, such as outage

Design, Configuration, and Maintenance of Pressure Relief Devices



PHMSA should remove the term “documented engineering analysis.” and instead simply refer to documentation, including engineering standards.



PHMSA remove the term “with onsite personnel” from §192.773(a)(3)(ii).



PHMSA clarify the repair timelines to be 30 days, unless the repair timeline is impracticable, in which case the repair must be completed as soon as practicable.

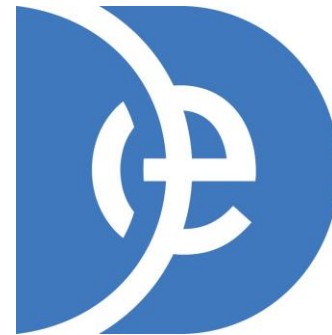


Remove the requirement for upstream and downstream isolation valves and instead require the ability to isolate the relief valve for maintenance and testing.

Questions?

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