

Title 26

DEPARTMENT OF THE ENVIRONMENT

Subtitle 11 AIR QUALITY

Chapter 28 Control of Methane Emissions from the Natural Gas Industry

For Discussion Only

Authority: Environment Article, §§ 1-404, 2-103, 2-1202 and 2-1205, Annotated Code of Maryland

.01 Definitions.

A. In this chapter, the following terms have the meanings indicated.

B. Terms Defined.

- (1) “Affected facilities” means any one of the following facilities:
 - (a) Cove Point Liquefied Natural Gas Station;
 - (b) Myersville Natural Gas Compressor Station;
 - (c) Accident Natural Gas Compressor Station and Storage;
 - (d) Rutledge Natural Gas Compressor Station;
 - (e) Ellicott City Natural Gas Compressor Station; and
 - (f) Any new, modified, or reconstructed natural gas compressor station, natural gas underground storage facility, or liquefied natural gas station.
- (2) “Audio, visual, olfactory inspection” means sensory monitoring to detect natural gas leaks utilizing a human ear, eyes, and nose.
- (3) “Blowdown” means the release of pressurized natural gas from stations, equipment, or pipelines into the atmosphere for maintenance, testing, repair, and replacement activities.
- (4) “Component” means a valve, fitting, flange, threaded-connection, process drain, stuffing box, pressure-vacuum valve, pressure-relief device, pipes, seal fluid system, diaphragm, hatch, sight-glass, meter, open-ended line, well casing, natural gas powered pneumatic device, natural gas powered pneumatic pump, reciprocating compressor rod packing/seal, metal to metal joint or seal of non-welded connection separated by a compression gasket, screwed thread (with or without thread sealing compound), metal to metal compression, or fluid barrier through which natural gas or liquid can escape to the atmosphere.
- (5) “Continuous bleed” means the continuous venting of natural gas from a gas powered pneumatic device to the atmosphere.
- (6) “Difficult-to-monitor” means components that cannot be monitored for natural gas leakage without elevating the monitoring personnel more than two (2) meters above the grade.
- (7) “Direct measurement” means use of high volume sampling, calibrated bagging, calibrated flow measuring instrument, or a temporary meter.
- (8) “Fuel gas system” means components and equipment that collect and transfer natural gas to be used as a fuel source to on-site natural gas powered equipment other than a vapor control device.
- (9) Fugitive Emissions Component.
 - (a) “Fugitive emission component” means any component that has the potential to emit fugitive emissions of natural gas, including but not limited to valves, connectors, pressure relief devices, open-ended lines, flanges, covers, vapor collection systems, thief hatches or other openings on a storage vessel, compressors, instruments, natural-gas powered pneumatic devices, and meters.
 - (b) “Fugitive emission component” does not include devices that vent as a part of normal operations, such as natural gas-driven pneumatic device, insofar as the natural gas discharged from the device’s vent is not considered a fugitive emission.
- (10) “Leak or fugitive leak” means any visible emission from a fugitive emissions component observed using optical gas imaging or an instrument reading of 500 ppm or greater using U.S. EPA Method 21 (40 CFR 60, Appendix A-7) or any emissions discovered from a fugitive emissions component observed using an auditory, visual or olfactory inspection.
- (11) “Leak detection and repair or LDAR” means the inspection of components to detect leaks of total hydrocarbons and the repair of components with leaks above the standards specified in this chapter and within the timeframes specified in this chapter.
- (12) “Liquefied natural gas or LNG” means natural gas or synthetic gas having methane (CH₄) as its major constituent which has been changed to a liquid.
- (13) “LNG station” means a pipeline transmission facility that is used for liquefying natural gas or synthetic gas or transferring, storing, or vaporizing liquefied natural gas, and includes all components and stationary equipment within the fence-line.
- (14) “Natural gas” means a naturally occurring mixture or process derivative of hydrocarbon and non-hydrocarbon gases, which has methane (CH₄) as its major constituent.

(15) “Natural gas compressor station” means all equipment and components located within a facility fence-line associated with moving natural gas from production fields or natural gas processing plants through natural gas transmission pipelines, or within natural gas storage fields.

(16) “Natural gas underground storage” means all equipment and components associated with the temporary subsurface storage of natural gas in depleted crude oil or natural gas reservoirs or salt dome caverns, not including gas disposal wells.

(17) “Optical gas imaging or OGI” means an instrument that makes emissions visible that may otherwise be invisible to the naked eye.

(18) “Pneumatic device” means an automation device that uses natural gas, compressed air, or electricity to control a process.

(19) “Reciprocating natural gas compressor” means equipment that increases the pressure of natural gas by positive displacement of a piston in a compression cylinder and is powered by an internal combustion engine or electric motor with a horsepower rating supplied by the manufacturer.

(20) “Reciprocating natural gas compressor rod packing” means a seal comprising of a series of flexible rings in machined metal cups that fit around the reciprocating compressor piston rod to create a seal limiting the amount of compressed natural gas that leaks into the atmosphere.

(21) “Reciprocating natural gas compressor seal” means any device or mechanism used to limit the amount of natural gas that leaks from a compression cylinder into the atmosphere.

(22) “Sales gas system” means components and equipment that collect and transfer natural gas to be used as a fuel source for natural gas powered equipment off-site.

(23) “Successful repair” means tightening, adjusting, or replacing equipment or a component for the purpose of stopping or reducing fugitive leaks below the minimum leak threshold or emission flow rate standard specified in this chapter.

(24) “Unsafe-to-monitor” means components that cannot be monitored for natural gas leakage because monitoring personnel would be exposed to immediate danger while conducting a monitoring survey.

(25) “Vapor collection system” means equipment and components installed on pressure vessels, separators, tanks, or sumps including piping, connections, reciprocating compressors, natural gas-powered pneumatic devices, and flow-inducing devices used to collect and route emission vapors to a processing, sales gas, or fuel gas system; or to a vapor control device.

(26) “Vapor control device” means destructive or non-destructive equipment used to control otherwise vented emissions.

.02 Applicability.

The provisions of this chapter apply to an affected facility as that term is defined in Regulation .01B of this chapter.

.03 Leak Detection and Repair Requirements

A. Affected facilities that are natural gas compressor stations and natural gas underground storage facilities and use natural gas-powered equipment to compress natural gas shall comply with the following leak detection and repair requirements.

(1) Owners and operators of affected facilities subject to this section shall develop and submit to the Department an initial methane emissions monitoring plan that includes the following items:

(a) A list of all fugitive emissions components, difficult-to-monitor, and unsafe-to-monitor components at an affected facility.

(b) Procedures and timeframes to identify fugitive emissions detection and needed repair.

(c) A defined observation path throughout the site to confirm all components can be viewed and recorded.

(d) Manufacturer and model number of fugitive emissions detection equipment to be used.

(i) If an affected facility uses optical gas imaging to meet the requirements of §A(5) of this regulation, the monitoring plan must include elements specified in 40 CFR §60.5397a (c)(7).

(ii) If an affected facility uses EPA Method 21 (40 CFR 60, Appendix A-7) to meet the requirements of §A(5) of this regulation, the monitoring plan must include elements specified in 40 CFR §60.5397a (c)(8).

(2) Owners and operators of the affected facilities subject to this section shall submit the initial methane emissions monitoring plan required in §A(1) to the Department within 60 days of the adoption of this regulation.

(3) Owners and operators of affected facilities that install any new, modified, or reconstructed natural gas compressor station or underground storage facility shall submit an initial monitoring plan with the elements in §A(1) of this regulation within 60 days of the facility startup operation for each new collection of fugitive emissions components at the new, modified, or reconstructed compressor station.

(4) Except for unsafe-to-monitor components, owners or operators of affected facilities subject to this section shall conduct an audio, visual, and olfactory inspection of all fugitive emission components for leaks or indications of leaks at least once per calendar week.

(5) Leak Monitoring Survey.

(a) Owners and operators of affected facilities subject to this section shall inspect all fugitive emission components for leaks using an OGI or EPA Method 21 within 150 days of the adoption of this regulation and quarterly thereafter.

(b) Owners and operators of affected facilities that install any new, modified, or reconstructed natural gas compressor station or underground storage facility that uses natural gas-powered equipment to compress natural gas shall meet the requirements of §A(5)(a) within 150 days of the startup of the facility’s operations.

(c) At least annually, all difficult-to-monitor components shall be inspected for leaks using an optical gas imaging (OGI) camera.

(6) Repair Requirements.

(a) Any leaking fugitive emissions component shall be successfully repaired, replaced, or removed from service as soon as practicable, but no later than 30 calendar days of initial leak detection.

(b) Each repaired or replaced fugitive emissions component must be resurveyed within 30 days after being repaired or replaced using either OGI or EPA Method 21 (40 CFR 60, Appendix A-7).

(i) Owners and operators of facilities subject to this section that use EPA Method 21 (40 CFR 60, Appendix A-7) to resurvey the repaired or replaced fugitive emissions component shall consider the fugitive emissions component repaired when the EPA Method 21 (40 CFR 60, Appendix A-7) instrument indicates a concentration of less than 500 ppm or when no soap bubbles are observed when using a bubble test.

(ii) Owners and operators of affected facilities subject to this section that use optical gas imaging to resurvey the repaired or replaced fugitive emissions component shall consider the fugitive emissions component repaired when the optical gas imaging instrument shows no indication of visible emissions.

(c) A delay of repair may be granted by the Department, if the owner or operator can provide documentation that:

(i) It will take longer than 30 days to have the parts or equipment required to make necessary repairs ordered and delivered;

(ii) Repairing a leaking component is technically infeasible;

(iii) The repair requires a vent or compressor station blowdown; or

(iv) The repair is unsafe to repair during the operation of the unit.

(d) Leaking components under the delay of repair shall be clearly marked and the repair or replacement of the leaking component or equipment must be completed during the next planned compressor station shutdown, vent blowdown, or within 7 days after the owner or operator receives parts or equipment needed to fix the leaking component or equipment.

B. Affected facilities that are natural gas compressor stations and natural gas underground storage facilities and use electric-powered equipment to compress natural gas shall comply with the following leak detection and repair requirements.

(1) Owners and operators of facilities in this section shall meet the requirements of §A(1)—(3) and (6) of this regulation.

(2) Except for unsafe-to-monitor components, owners or operators of facilities in this section shall conduct an audio, visual, and olfactory inspection of all fugitive emission components for leaks or indications of leaks at least once per calendar month.

(3) Leak Monitoring Survey

(a) Owners and operators of affected facilities subject to this section shall inspect all fugitive emission components, including difficult-to-monitor components, for leaks using an optical gas imaging (OGI) or US EPA Reference 21 within 150 days of the adoption of this regulation and annually thereafter.

(b) Owners and operators of affected facilities that install any new, modified, or reconstructed natural gas compressor station or underground storage facility that uses natural gas-powered equipment to compress natural gas shall meet the requirements of §B(3)(a) within 150 days of the startup of the facility's operations.

C. Cove Point Liquefied Natural Gas station shall comply with the leak detection and repair requirements as specified by the Climate Action Plan, which is defined, prepared, and approved under COMAR 26.09.02.06.B – E.

D. Any new, modified, or reconstructed liquefied natural gas station, that begins operations after the effective date of this Chapter, shall comply with §A of this regulation.

E. The Department may approve a new technology or alternative practice to identify leaking fugitive emissions components as an equivalent substitution for the requirements in §A or §B of this regulation, if an owner requests approval from the Department.

.04 Natural Gas-Powered Pneumatic Devices Methane Emission Control Requirements.

A. All affected facilities listed under Regulation .01 of this chapter must follow these requirements and §B of this regulation.

(1) Beginning January 1, 2021, each natural gas-powered pneumatic device shall comply with the leak detection and repair requirements specified in Regulation .03 of this chapter when the device is idle and not controlling.

(2) Beginning January 1, 2021, no natural gas-powered pneumatic device shall vent natural gas at a rate greater than six (6) standard cubic feet per hour.

(3) Each natural gas-powered pneumatic device must be tagged with the month and year of installation, reconstruction, or modification, and identification information including a permanent tag that identifies the natural gas flow rate as less than or equal to six (6) standard cubic feet per hour.

(4) Continuous bleed pneumatic devices in operation may be used provided that the devices meet the following requirements:

(a) The device shall be tested annually using a direct measurement method (high volume sampling, bagging, calibrated flow measuring instrument); and

(b) Any device with a measured emissions flow rate that exceeds six (6) standard cubic feet per hour shall be successfully repaired within 14 calendar days from the date of the exceedance.

B. Beginning January 1, 2022, each natural gas-powered pneumatic device shall:

(1) Collect all vented natural gas with the use of a vapor collection system; or

(2) Use compressed air or electricity to operate.

.05 Reciprocating Natural Gas Compressor Methane Emission Control Requirements.

A. All reciprocating natural gas compressor components at an affected facility shall comply with the leak detection and repair requirements specified in §A(5) and (6) of Regulation .03 of this chapter.

B. Control Measures.

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(1) Beginning January 1, 2021, compressor vent stacks used to vent rod packing/seal emissions shall be controlled with the use of a vapor collection system as specified in Regulation .06 of this chapter; or

(2) A reciprocating natural gas compressor with a rod packing/seal with a measured emission flow rate that exceeds 0.5 standard cubic feet per minute, or a combined rod packing or seal emission flow rate that exceeds the number of compression cylinders multiplied by 0.5 standard cubic feet per minute shall be successfully repaired or replaced within 30 calendar days from the date of the exceedance.

C. The reciprocating natural gas compressor rod packing/seal emission flow rate through the rod packing/seal vent stack shall be measured annually by April 1st of each year beginning in 2021 through direct measurement (high volume sampling, bagging, calibrated flow measuring instrument) while the compressor is operating at normal operating temperature.

(1) Direct measurements shall use one of the following methods:

(a) Vent stacks shall be equipped with a meter or instrumentation to measure the rod packing or seal emissions flow rate; or

(b) Vent stacks shall be equipped with a clearly identified access port installed at a height of no more than six feet above grade or a permanent support surface to measure individual or combined rod packing or seal emission flow rates..

(2) If the measurement is not obtained because the compressor is not operating for the scheduled test date then testing shall be conducted within seven calendar days of resumed operation.

D. Delay of Repair

(1) A delay of repair may be granted by the Department if the owner or operator provides documentation that the delivery of parts or equipment required to make necessary repairs will take more than 30 days from the last emission flow rate measurement and have been ordered.

(2) A delay of repair to obtain parts or equipment shall not exceed 60 days from the date of last emission flow rate measurement unless the owner or operator notifies the Department, in writing, of the extended delay and provides an estimated time by which the repairs will be completed.

(3) A reciprocating natural gas compressor with a rod packing/seal emission flow rate measured above the standard specified in §B(2) of this regulation, and which has leaking parts that has been approved by the Department as technically infeasible, unsafe to monitor or requires a facility shutdown shall be successfully repaired by the end of the next planned process shutdown or within 12 months from the date of the flow rate measurement, whichever is sooner.

.06 Vapor Collection System and Vapor Control Devices

A. The vapor collection system shall route all gases, vapors, and fumes to one of the following:

(1) Sales gas system;

(2) Fuel gas system; or

(3) Beginning January 1, 2021, all vapor control devices shall be one of the following:

(a) A non-destructive vapor control device manufacturer-certified to achieve at least 95 percent vapor control efficiency of total emissions and shall not result in emissions of nitrogen oxides (NO_x); or,

(b) A destructive vapor control device manufacturer-certified to achieve at least 95 percent vapor control efficiency of total emissions and not more than 15 parts per million volume (ppmv) NO_x when measured at 3 percent oxygen; and does not require the use of supplemental fuel gas, other than gas required for a pilot burner, to operate.

B. The vapor collection system shall have no detectable emissions, as determined using auditory, visual, and olfactory inspections as specified in §A(4) of Regulation .03 of this chapter.

C. The vapor collection system shall comply with the leak detection and repair requirements specified in §A(5) and (6) of Regulation .03 of this chapter.

.07 Record Keeping and Reporting Requirements

A. Owners or operators of affected facilities shall maintain, and make available upon request by the Department, a copy of records necessary to verify compliance with the provisions of this chapter.

(1) For each leak monitoring survey conducted according to Regulation .03 of this chapter, owners and operators shall:

(a) Submit a report to the Department within 60 days of each leak monitoring survey with the following information:

(i) Location of each fugitive emission and repair;

(ii) Any deviations from the monitoring plan or a statement that there were no deviations from the monitoring plan;

(iii) Number and type of components for which fugitive emissions were detected;

(iv) Number and type of difficult-to-monitor fugitive emission components monitored;

(v) Instrument reading of each fugitive emissions component that requires repair when EPA Method 21 (40 CFR 60, Appendix A-7) is used for monitoring;

(vi) Number and type of fugitive emissions components that were not repaired;

(vii) Number and type of components that were tagged as a result of not being repaired during the monitoring survey when the fugitive emissions were initially found;

(viii) If a fugitive emissions component is not tagged, a digital photograph or video of each fugitive emissions component that could not be repaired during the monitoring survey when the fugitive emissions were initially found;

(ix) Repair methods applied in each attempt to repair the fugitive emissions components;

(x) Number and type of fugitive emission components placed on delay of repair and explanation for each delay of repair;

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(xi) The date of successful repair of the fugitive emissions component; and
(xii) Instrumentation used to resurvey a repaired fugitive emissions component that could not be repaired during the initial fugitive emissions finding.

(b) Maintain, for at least five years, record of each leak detection and repair inspection, along with the following information:

- (i) Date of the survey;
 - (ii) Beginning and end time of the survey;
 - (iii) Name of operator(s) performing survey;
 - (iv) Monitoring instrument used including the manufacturer, model number, serial number, and calibration documentation;
 - (v) When optical gas imaging is used to perform the survey, one or more digital photographs or videos, captured from the optical gas imaging instrument used for conduct of monitoring, of each required monitoring survey being performed;
 - (vi) Fugitive emissions component identification when EPA Method 21 (40 CFR 60, Appendix A-7) is used to perform the monitoring survey;
 - (vii) Ambient temperature, sky conditions, and maximum wind speed at the time of the survey;
 - (viii) Any deviations from the monitoring plan or a statement that there were no deviations from the monitoring plan;
- and

(ix) Proof that parts or equipment required to make necessary repairs have been ordered.

(2) For each natural gas-powered pneumatic device, owners and operators shall:

- (a) Maintain, for at least five years from the date of each emissions flow rate measurement, a record of the emission flow rate measurement and report annually beginning April 1, 2021;
- (b) Maintain records of the date, location and manufacturer specifications for each pneumatic device constructed, modified or reconstructed and report annually beginning April 1, 2021;
- (c) Maintain records of the manufacturer’s specifications indicating that the device is designed such that natural gas bleed rate is less than or equal to 6 standard cubic feet per hour;
- (d) Maintain records of the demonstration that the use of pneumatic device with a natural gas bleed rate greater than the applicable standard is required and the reasons why and report annually beginning April 1, 2021;
- (e) Maintain records of deviations in cases where the pneumatic device was not operated in compliance with the requirements specified in Regulation .04 of this chapter and report annually beginning April 1, 2021; and
- (f) Maintain, for at least five years, purchase orders, work orders, or any in-house or third-party reports produced or provided to the affected facility.

(3) For each reciprocating natural gas compressor, owners and operators shall:

- (a) Maintain, for at least five years from the date of each leak concentration measurement, a record of each rod packing leak concentration measurement found above the minimum leak threshold and report annually beginning April 1, 2021;
- (b) Maintain, for at least five years from the date of each emissions flow rate measurement, a record of each rod packing or seal emission flow rate measurement and report annually beginning April 1, 2021;
- (c) Maintain, for at least one calendar year, a record that documents the date(s) and hours of operation a compressor is operated in order to demonstrate compliance with the rod packing leak concentration or emission flow rate measurement in the event that the compressor is not operating during a scheduled inspection;
- (d) Maintain records that provide proof that parts or equipment required to make necessary repairs have been ordered;
- (e) Report annually the cumulative number of hours of operation or the number of months since initial startup or since the previous reciprocating compressor rod packing replacement, whichever is later, and beginning April 1, 2021;
- (f) Submit a statement that emissions from the rod packing are being routed to a process through a closed vent system under negative pressure, if applicable;
- (g) Report records of deviations that occurred during the reporting period annually beginning April 1, 2021; and
- (h) Maintain, for at least five years, a record of purchase orders, work orders, or any in-house or third-party reports produced or provided to the affected facility.

B. Blowdown Events and Reports

(1) Affected facilities shall notify the Department and post notifications on a publicly accessible website at least seven days prior to any planned blowdown event.

(2) Affected facilities shall notify the Department and post notifications on a publicly accessible website within one hour of any emergency blowdown event.

(a) When safety concerns preclude a facility from providing prior notification of an emergency blowdown the requirements of regulation B(2) shall not apply.

(b) In the event a facility is unable to notify the Department or public prior to an emergency blowdown event, the facility shall send notice to the Department within 24 hours indicating the reasoning why prior notice was not possible.

(3) Affected facilities shall report the following information on blowdown emissions within 15 miles of the facility’s fence-line to the Department annually by April 1 of each year:

- (a) Date and type (i.e. planned or emergency) of each blowdown event;
- (b) Methane emissions in metric tons released from each blowdown event; and
- (c) Annual methane emissions in metric tons from all blowdown events.

(4) Methane emissions shall be calculated according to procedures in 40 CFR Part 98 Subpart W §98.233(i).

C. Greenhouse Gas Emissions Reporting.

(1) Owners and operators of affected facilities shall report methane, carbon dioxide, and nitrous oxide mass emissions to the Department annually by April 1st.

(2) Owners and operators of affected facilities shall follow the procedures for emission calculation, monitoring, quality assurance, missing data, recordkeeping, and reporting that are specified in 40 CFR Part 98 Subpart C and 40 CFR Part 98 Subpart W.

(3) The reporting threshold in 40 CFR §98.30 and 40 CFR §98.231 does not exempt an affected facility from following the requirements in §B(1) and (2) of this regulation.

D. All required reports shall be submitted to:

The Maryland Department of the Environment
Air and Radiation Compliance Division
1800 Washington Boulevard, 7th floor
Baltimore MD 21230
Attention Compliance Engineer

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