New Mexico Environment Department Testimony in EIB 21-27 (R)

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Section 20.2.50.122 – Pneumatic Controllers and Pumps

Overview of Pneumatic Controllers and Pumps

- Process control devices used throughout the oil and gas sector to control the position of valves.
- Natural gas-powered pneumatic controllers use natural gas as motive force to operate valves that regulate safety shut down, position, fluid level, pressure, temperature and flow rate. May be powered by compressed air instead of natural gas.
- Used to control multiple processes based on a sensed process parameter, such as liquid level in a tank or oil-water separator.
- Can be used as emergency shutoff devices, to regulate flow or liquid levels, or as temperature and pressure regulators.

Overview of Pneumatic Controllers and Pumps

- An example is to control liquid level in a separator. When the liquid level reaches a high set-point in the separator based on the setting of a level gauge, the associated pneumatic controller sends a signal to open the control valve between the separator and the tank.
- This signal would consist of pressurized pneumatic gas turning the valve from the “closed” to the “open” position. When the level in the separator reaches a low level, the pneumatic controller sends a signal to the control valves to close and to stop flow from the separator to the tank.
- VOC and methane emissions occur from natural gas-powered pneumatic controllers when the pressurized gas is directed to atmosphere after the control action is performed.

Overview of Pneumatic Controllers and Pumps

- Pneumatic pumps inject chemicals into the wellbore, circulate glycol in cold climates, and move liquids from one place to another (sump pumps).
- VOC and methane emissions occur from pneumatic pumps when pressurized gas used to drive the pumping action is released to atmosphere after the pumping action. The quantity of VOC emitted is dependent on the type of pump employed and the concentration of VOC in the gas stream.
- Natural gas-driven pneumatic controllers and pumps are available in a variety of designs, are characterized by their bleed rate, which is a measure of how much natural gas is used to operate the pneumatic controller or pump

Overview of Pneumatic Controllers and Pumps

- Continuous bleed controllers emit or “bleed” natural gas continuously
- When the process condition rises or falls above or below that set point, the pneumatic controller responds to return the process to that predetermined set point. Continuous bleed controllers may either be:
  - low bleed - a bleed or emissions rate less than or equal to 6 standard cubic feet per hour (scfh), or
  - high bleed - a bleed or emissions rate greater than 6 scfh.

Overview of Pneumatic Controllers and Pumps

- Intermittent controllers do not vent continuously, but instead release gas only when they open or close a valve, or as they adjust gas flow.
- The bleed rate from these controllers depends on the amount of gas vented per actuation (i.e., each opening or closing of a valve or adjustment of gas flow) and the frequency of actuation.
- Zero bleed pneumatic controllers do not bleed natural gas at all. They are self-contained units that release gas to a downstream pipeline.

Emission Control Options

- There are several ways to reduce emissions from pneumatic controllers, including:
  - Replacing high bleed controllers with low bleed or zero bleed models,
  - Using instrument air rather than natural gas to drive controllers and using non-gas-driven controllers such as mechanical or electric controllers, including solar-powered controllers.
  - Regular maintenance and proper adjustment of pneumatic controllers can also be used to minimize emissions by repairing leaks and optimizing the amount of gas needed to operate the device.
- Options for reducing emissions from pneumatic pumps include:
  - Using instrument air rather than natural gas to drive pumps,
  - Using non-gas-driven pumps, such as electric pumps, or
  - Routing emissions to a control device or process

Basis for Proposed Requirements

- NMED's proposal is a simplified version of the concept developed by Colorado
  - Requires a total percentage of controllers to be non-emitting through 2030
  - Graduated requirements depending on the number of non-emitting controllers that an operator starts with
  - While based on Colorado's Reg. 7, NMED's proposal differs in important ways:
    - NMED does not exempt low producing wells as Reg. 7 does
    - NMED proposal is based on total controller count, not based on production amounts
    - Important distinction because Colorado has other regulations in place that have already addressed emissions from pneumatics
  - Provides similar flexibility as Colorado's Reg. 7
    - Operators can prioritize high producing production facilities
    - Includes exceptions for certain temporary controllers or used in specific circumstances
    - Provides for emitting controllers for safety and process purposes
  - Contains options for complying with the requirements
    - Offramp if owners meet a 75% non-emitting controller count by January 1, 2025
    - If after January 1, 2027, remaining units are not cost effective to retrofit, an owner may submit an analysis of the retrofit costs for the department's consideration

Estimated Emission Reductions and Costs

- Estimated overall emission reduction of 31,347 TPY VOC emissions as a result of the rule.
- These reductions are achieved at an estimated cost effectiveness of $2,475/ton VOC.
- This cost effectiveness is based on costs from U.S. EPA. Lessons Learned: Convert Gas Pneumatic Controls to Instrument Air. OAR: Natural Gas Star (October 2006).

Overview of Definitions

C. **"Bleed rate"** means the rate in standard cubic feet per hour at which ~~natural~~ gas is continuously ~~or intermittently~~ vented from a pneumatic controller.

Z. **"Non-Emitting Controller"** means a device that monitors a process parameter such as liquid level, pressure, or temperature and sends a signal to a control valve in order to control the process parameter and does not emit natural gas to the atmosphere. Examples of non-emitting controllers include but are not limited to instrument air or inert gas pneumatic controllers, electric controllers, mechanical controllers and Routed Pneumatic Controllers.

EE~~EE~~. **"Pneumatic controller"** means a device that monitors a process parameter such as liquid level, pressure, or temperature and uses pressurized gas (which may be released to the atmosphere during normal operation) and sends a signal to a control valve in order to control the process parameter. Controllers that do not utilize pressurized gas are not pneumatic controllers.

(1) "High-Bleed Pneumatic Controller" means a continuous bleed pneumatic controller that is designed to have a continuous bleed rate that emits in excess of 6 standard cubic feet per hour (scfh) of natural gas to the atmosphere.

(2) "Low-Bleed Pneumatic controller" means a continuous bleed pneumatic controller that is designed to have a continuous bleed rate that emits less than or equal to 6 scfh of natural gas to the atmosphere.

(3) "Intermittent pneumatic controller" means a pneumatic controller that is not designed to have a continuous bleed rate but is designed to only release natural gas above de minimis amounts to the atmosphere as part of the actuation cycle.

Summary of Applicability and Emission Standards

20.2.50.122 PNEUMATIC CONTROLLERS AND PUMPS:

A. Applicability: Natural gas-driven pneumatic controllers and pumps located at well~~head~~ sites, tank batteries, gathering and boosting ~~sites~~stations, natural gas processing plants, and transmission compressor stations are subject to the requirements of 20.2.50.122 NMAC.

B. Emission standards:

(1) A new natural gas-driven pneumatic controller or pump shall comply with the requirements of 20.2.50.122 NMAC upon startup.

(2) An existing natural gas-driven pneumatic pump shall comply with the requirements of 20.2.50.122 NMAC within three years of the effective date of this Part.

(3) An existing natural gas-driven pneumatic controller shall comply with the requirements of 20.2.50.122 NMAC according to the following schedule:

Table 1 – WELL~~HEAD~~ SITES, TANK BATTERIES, GATHERING AND BOOSTING ~~FACILITIES~~STATIONS

Total Historic Percentage of Non-Emitting Controllers	Total Required Percentage of Non-Emitting Controllers by January 1, 2024	Total Required Percentage of Non-Emitting Controllers by January 1, 2027	Total Required Percentage of Non-Emitting Controllers by January 1, 2030
> 75~~-~~%	80%	85%	90%
> 60-75~~-~~%	80%	85%	90%
> 40-60~~-~~%	65%	70%	80%
> 20-40~~-~~%	45%	70%	80%
0-20~~-~~%	25%	65%	80%

Table 2 – TRANSMISSION ~~NATURAL GAS~~ COMPRESSOR STATIONS AND GAS PROCESSING PLANTS

Total Historic Percentage of Non-Emitting Controllers	Total Required Percentage of Non-Emitting Controllers by January 1, 2024	Total Required Percentage of Non-Emitting Controllers by January 1, 2027	Total Required Percentage of Non-Emitting Controllers by January 1, 2030
> 75~~-~~%	80%	95%	98%
> 60-75~~-~~%	80%	95%	98%
> 40-60~~-~~%	65%	95%	98%
> 20-40~~-~~%	50%	95%	98%
0-20~~-~~%	35%	95%	98%

Summary of Emission Standards

(4) Standards for natural gas-driven pneumatic controllers.

(a) new pneumatic controllers shall have an emission rate of zero.

(b) existing pneumatic controllers with access to commercial line electrical power shall have an emission rate of zero within two years of the effective date of this Part.

(c) existing pneumatic controllers shall meet the required percentage of non-emitting controllers within the deadlines in tables 1 and 2 of Paragraph (3) of Subsection B of 20.2.50.122 NMAC, and shall comply with the following:

(i) by January 1, 2023, the owner or operator shall determine the total controller count for all controllers at all of the owner or operator's affected facilities that commenced construction before the effective date of this Part. The total controller count must include all emitting pneumatic controllers and all non-emitting pneumatic controllers, except that pneumatic controllers necessary for a safety or process purpose that cannot otherwise be met without emitting natural gas shall not be included in the total controller count.

(ii) determine which controllers in the total controller count are non-emitting and sum the total number of non-emitting controllers and designate those as total historic non-emitting controllers.

(iii) determine the total historic non-emitting percent of controllers by dividing the total historic non-emitting controller count by the total controller count and multiplying by 100.

(iv) based on the percent calculated in (iii) above, the owner or operator shall determine which provisions of tables 1 and 2 of Paragraph (3) of Subsection B of 20.2.50.122 NMAC apply and the replacement schedule the owner or operator must meet.

(v) if an owner or operator meets at least seventy-five percent total non-emitting controllers by January 1, 2025, the owner or operator is not subject to ~~has satisfied~~ the requirements of tables 1 and 2 of Paragraph (3) of Subsection B of 20.2.50.122 NMAC.

Summary of Emission Standards

(vi) if after January 1, 2027, an owner or operator's remaining pneumatic controllers are not cost-effective to retrofit, the owner or operator ~~shall~~ may submit a cost analysis of retrofitting those remaining units to the department. The department shall review the cost analysis and determine whether those units qualify for a waiver from meeting additional retrofit requirements.

(d) a pneumatic controller with a bleed rate greater than six standard cubic feet per hour is permitted when the owner or operator has demonstrated that a higher bleed rate is required based on functional needs, including response time, safety, and positive actuation. An owner or operator that seeks to maintain operation of an emitting pneumatic controller must prepare and document the justification for the safety or process purposes prior to the installation of a new emitting controller or the retrofit of an existing controller. The justification shall be certified by a qualified professional or inhouse engineer.

(e) Temporary pneumatic controllers that emit natural gas and are used for well abandonment activities or used prior to or through the end of flowback, and pneumatic controllers used as emergency shutdown devices located at a well site, are not subject to the requirements of Subsection B of 20.2.50.122 NMAC.

(f) Temporary or portable pneumatic controllers that emit natural gas and are on-site for less than 90 days are not subject to the requirements of Subsection B of 20.2.50.122 NMAC.

(5) Standards for natural gas-driven pneumatic diaphragm pumps.

(a) new pneumatic diaphragm pumps located at ~~a~~ natural gas processing plants shall have an emission rate of zero.

(b) new pneumatic diaphragm pumps located at ~~a~~ well~~head~~ sites, tank batteries, gathering and boosting ~~sites~~stations, or transmission compressor stations with access to commercial line electrical power shall have an emission rate of zero.

Summary of Emission Standards and Monitoring Requirements

(c) existing pneumatic diaphragm pumps located at well sites, tank batteries, gathering and boosting stations, natural gas processing plants, or transmission compressor stations with access to commercial line electrical power shall have an emission rate of zero within two years of the effective date of this Part.

(~~d~~e) owners and operators of pneumatic diaphragm pumps located at well~~head~~ sites, tank batteries, gathering and boosting ~~sites~~stations, or transmission compressor stations without access to commercial line electrical power shall reduce VOC emissions from the pneumatic diaphragm pumps by ninety-five percent if it is technically feasible to route emissions to a control device, fuel cell, or process. If there is a control device available onsite but it is unable to achieve a ninety-five percent emission reduction, and it is not technically feasible to route the pneumatic diaphragm pump emissions to a fuel cell or process, the owner or operator shall route the pneumatic diaphragm pump emissions to the control device within two years of the effective date of this Part.

~~(6) The owner or operator of a pneumatic controller or pump shall install an EMT on the controller or pump in accordance with 20.2.50.112 NMAC.~~

C. Monitoring requirements:

(1) Pneumatic controllers or diaphragm pumps not using natural gas or other hydrocarbon gas as a motive force ~~with a natural gas bleed rate equal to zero~~ are not subject to the monitoring requirements in Subsection C of 20.2.50.122 NMAC.

(2) The owner or operator of a facility with one or more ~~a~~ natural gas-driven pneumatic controllers subject to the deadlines set forth in tables 1 and 2 of Paragraph (3) of Subsection B of 20.2.50.122 NMAC shall monitor the compliance status of each subject pneumatic controller at each facility.

(3) The owner or operator of a natural gas-driven pneumatic controller ~~with a bleed rate greater than zero~~ shall, on a monthly basis, ~~scan the controller and~~ conduct an AVO or OGI inspection, and shall also inspect the pneumatic controller, perform necessary maintenance (such as cleaning, tuning, and repairing a leaking gasket, tubing fitting and seal; tuning to operate over a broader range of proportional band; eliminating an unnecessary valve positioner), and maintain the pneumatic controller according to manufacturer specifications to ensure that the VOC emissions are minimized.

Summary of Monitoring and Recordkeeping Requirements

(4) The ~~EMT shall be linked to a~~ owner or operator's database ~~that~~ shall contain~~s~~ the following:

(a) natural gas-driven pneumatic controller unique identification number;
(b) type of controller (continuous or intermittent);
(c) if continuous, design continuous bleed rate in standard cubic feet per hour;
(d) if intermittent, bleed volume per intermittent bleed in standard cubic feet; and
(e) if continuous, design annual bleed rate in standard cubic feet per year.

(5) The owner or operator of a natural gas-driven pneumatic diaphragm pump ~~with a bleed rate greater than zero~~ shall, on a monthly basis, ~~scan the pump and~~ conduct an AVO or OGI inspection and shall also inspect the pneumatic pump and perform necessary maintenance, and maintain the pneumatic pump according to manufacturer specifications to ensure that the VOC emissions are minimized.

(6) The owner or operator of a natural gas-driven pneumatic controller shall comply with the requirements in Paragraph (3) of Subsection C or Subsection D of 20.2.50.116 NMAC. During instrument inspections, operators shall use RM 21, OGI, or alternative instruments used under Subsection D of 20.2.50.116 NMAC to verify that intermittent controllers are not emitting when not actuating. Any intermittent controller emitting when not actuating shall be repaired consistent with Subsection E of 20.2.50.116 NMAC.

(7) Prior to any monitoring event, the owner or operator shall date and time stamp the event, and the monitoring data entry shall be made in accordance with the requirements of this Part.

(6) The owner or operator shall comply with the monitoring requirements in 20.2.50.112 NMAC.

D. Recordkeeping requirements:

(1) Non-emitting ~~P~~pneumatic controllers and diaphragm pumps ~~with a natural gas bleed rate equal to zero~~ are not subject to the recordkeeping requirements in Subsection D of 20.2.50.122 NMAC.

(2) The owner or operator shall maintain a record of the total controller count for all controllers at all of the owner's or operator's affected facilities that commenced operation before the effective date of this Part. The total controller count must include all emitting and non-emitting pneumatic controllers.

(3) The owner or operator shall maintain a record of the total count of natural gas-driven pneumatic controllers necessary for a safety or process purpose that cannot otherwise be met without emitting VOC.

Summary of Recordkeeping Requirements

(4) The owner or operator of a natural gas-driven pneumatic controller subject to the requirements in tables 1 and 2 of Paragraph (3) of Subsection B of 20.2.50.122 NMAC shall generate a schedule for meeting the compliance deadlines for each pneumatic controller. -The owner or operator shall keep a record of the compliance status of each subject controller.

(5) The owner or operator shall maintain an electronic record for each natural gas-driven pneumatic controllerroller ~~with a natural gas bleed rate greater than zero~~. The record shall include the following:

(a) pneumatic controller unique identification number;

(b) time and date stamp, including GPS of the location, of any monitoring~~inspection dates~~;

(c) name of the ~~personnel~~ person(s) conducting the inspection;

(d) AVO or OGI inspection result;

(e) AVO or OGI level discrepancy in continuous or intermittent bleed rate;

(f) record of the controller type, bleed rate, or bleed volume required in Subparagraphs (b), (c), (d), and (e) of Paragraph (4) of Subsection C on 20.2.50.122 NMAC.

(g~~f~~) maintenance date and maintenance activity; and

(h~~g~~) a record of the justification and certification required in Subparagraph (d) of Paragraph (4) of Subsection B of 20.2.50.122 NMAC.

(6) The owner or operator of a natural gas-driven pneumatic controller with a bleed rate greater than six standard cubic feet per hour shall maintain a record ~~in the EMT database of the pneumatic controller~~ documenting why a bleed rate greater than six scf/hr is necessary, as required in Subsection B of 20.2.50.122 NMAC.

(7) The owner or operator shall maintain a record in the EMT database for a natural gas

Summary of Recordkeeping Requirements

(7) The owner or operator shall maintain a record ~~in the EMT database~~ for a natural gas-driven pneumatic pump with an emission rate greater than zero and the associated pump number at the facility. The record shall include:

(a) for a natural gas-driven pneumatic diaphragm pump in operation less than 90 days per calendar year, a record for each day of operation during the calendar year.

(b) a record of any control device designed to achieve at least ~~a~~ ninety-five percent emission reduction, including an evaluation or manufacturer specifications indicating the percentage reduction the control device is designed to achieve.

(c) records of the engineering assessment and certification by a qualified professional or inhouse engineer that routing pneumatic pump emissions to a control device, fuel cell, or process is technically infeasible.

(8) The owner or operator shall comply with the recordkeeping requirements in 20.2.50.112 NMAC.

E. Reporting requirements: The owner or operator shall comply with the reporting requirements in 20.2.50.112 NMAC.

[20.2.50.122 NMAC - N, XX/XX/2021]