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Methane Mitigation Solutions

Addressing Legacy Pneumatic Device Emissions and Super Emitter Events

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Methane emissions from the U.S. petroleum and natural gas industries are the largest source of domestic methane emissions—accounting for 30% of U.S. methane emissions and 3% of U.S. annual greenhouse gas (GHG) emissions.

In response to this and for the first time, the EPA can impose a fee on petroleum and natural gas facilties for producing methane emissions.

EPA's final rule to sharply reduce methane emissions from the petroleum and natural gas industries was announced at COP28 on December 2, 2023. The rule* requires State Implementation Plans (SIPs) to be submitted to the EPA within 24 months of publication in the Federal Register. Furthermore, states must establish compliance deadlines within 36 months of the state plan submittal deadline.

Petroleum and natural gas facilities that generate greater than 25,000 metric tons per year of total CO_2 equivalent GHGs are affected by these new guidelines. These companies are required to report their GHG emissions to the EPA according to 40 CFR Part 98 Subpart W—a regulation that requires companies to stay within a certain threshold of GHG emissions.

Failure to comply with this regulation will result in methane emissions fees administered by the EPA.

For onshore and offshore petroleum and natural gas production, storage, processing, and pipeline transmission, the EPA will administer Waste Emissions Charges of **$900 in 2024**, **$1200 in 2025**, and **$1500 in 2026 and thereafter** for every metric ton of methane over the respective process's emission threshold. Once all 50 states enact their own EPA-approved plan in compliance with rules OOOOb/c, the Waste Emissions Charge will be discontinued.

Waste Emissions Thresholds for Applicable Facilities

Categories of "Applicable Facilities"	Emissions Threshold Used to Calculate Fee
Onshore and offshore petroleum and natural gas production facilities	Emissions that exceed 0.20% of natural gas sent to sale from the facility *or* 10 metric tons of methane per million barrels of oil sent to sale if no natural gas was sent to sale from the facility
Onshore natural gas processing, LNG storage, LNG import and export equipment, or onshore petroleum and natural gas gathering and boosting facilities	Emissions that exceed 0.05% of the natural gas sent to sale "from or through" the facility
Onshore natural gas transmission compression, underground natural gas storage, or onshore natural gas transmission pipeline facilities	Emissions that exceed 0.11% of the natural gas sent to sale "from or through" the facility

*40 CFR Part 60 Subpart OOOOb (NSPS for New Source Performance Standards) and 40 CFR Part 60 Subpart OOOOc (EG Emission Guidelines for existing sources).

Legacy Pneumatic Device Emissions

Methane emissions from pneumatic devices have been one of the largest sources of vented methane emissions in the oil and gas industry. The EPA estimates that 47 percent of the total nationwide emissions from pneumatic controllers occur from sites with less than four controllers. Fisher™ and other manufacturers' legacy pneumatic devices powered by methane are a significant source of facility emissions. Continuing to use them could result in hefty fees.

The following table shows different steady-state bleed rates of legacy Fisher devices, along with estimated methane emissions and the potential financial impact of the Waste Emissions Charge.

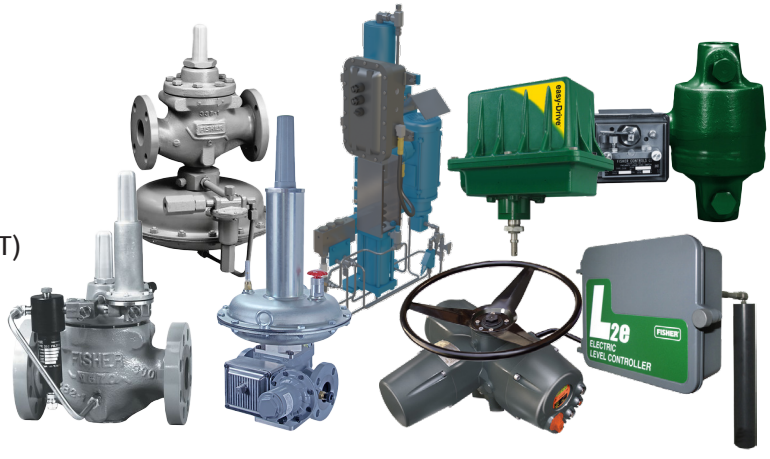
Potential Waste Emissions Charges From Legacy Fisher™ Devices

Controller/ Instrument Type	Pressure Supply (Psig)	Methane Emissions (MT CH_4/Year)[1]	Natural Gas Cost ($/Year)[2]	Potential Waste Emissions Charge 2024 ($)[3]	Potential Waste Emissions Charge 2026 ($)[4]
Fisher 846 Electro-Pneumatic Transducer	20	52.11	6,460	46,901	78,169
	35	78.17	9,690	70,352	117,253
Fisher i2P-100 Electro-Pneumatic Transducer	20	0.56	70	508	847
	35	0.89	110	801	1,335
Fisher 3582i Electro-Pneumatic Positioner	20	3.73	463	3,361	5,602
	30	4.65	576	4,182	6,970
	40	5.17	641	4,651	7,752
Fisher FIELDVUE™ DVC6200 Digital Valve Controller Standard Relay	20	3.04	377	2,736	4,560
	35	10.64	1,319	9,576	15,959
Fisher FIELDVUE DVC6200 Digital Valve Controller Low Bleed Relay	20	0.46	57	410	684
	Up to 70	1.01	125	909	1,515
	Up to 80	1.50	186	1,348	2,247

The EPA stipulates zero emissions controllers in the final rule in all areas except Alaska. With available zero emissions technologies from Emerson, it will be easier to comply with the EPA's new emissions standards.

Zero Emissions Technologies

- Fisher 1098-EGR Pressure Reducing Regulator
- Fisher LS200 Series Regulators
- Fisher EZR Series Pressure Reducing Regulators
- Shafer Emissions Controlled Actuation Technology (ECAT)
- Fisher easy-Drive™ 200L Electric Actuator
- Smart Bettis™ and EIM™ Electric Actuators
- Fisher 2100E Electric Liquid Level Switch
- Fisher L2e Electric Level Controller



[1]Fisher published data for natural gas bleed rates found by dividing compressed air bleed rates by $\sqrt{0.6}$. A density of 0.0192 kg/scf at STP was used to convert scf of CH_4 to MT (1000kg) of CH_4.

[2]Natural gas costs calculated using December 2023 Henry Hub Natural Gas Spot Price of $2.38/mmBTU

[3]The Waste Emissions Charge for 2024 is $900/(MT CH_4)

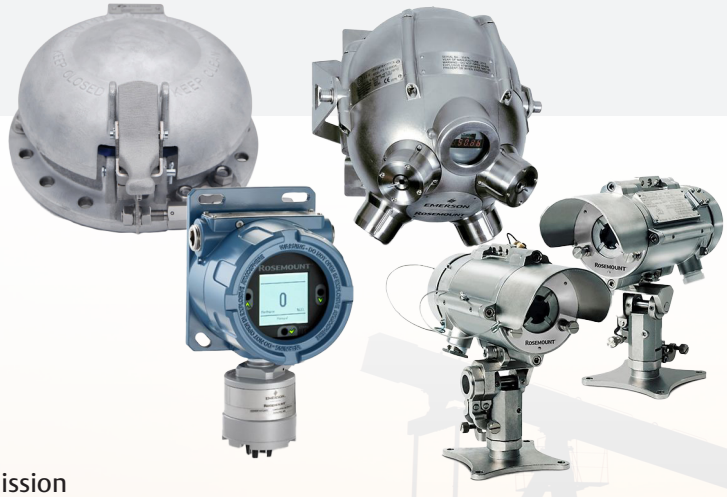
[4]The Waste Emissions Charge for 2026 is $1500/(MT CH_4)

Super Emitter Events

The final rule establishes a Super Emitter Response Program, whereby an owner or operator must determine the cause of a super emitter event upon receiving certified notification (from regulatory authorities or qualified third parties) of facility emissions greater than 100 kg/hour. The events, along with any corrective actions, will be available on a public website. Left unidentified and unchecked, super emitter events can contribute significantly to excessive emissions.

A facility can mitigate the risk of a super emitter event and subsequent notification with Emerson's wireless monitoring solutions, which can report the status of:

- Thief Hatches
- Conservation Vents
- Pressure Relief Valves
- Pressure Reducing Regulators
- Dump Valves



Emissions Monitoring Technologies

- TopWorx™ GO™ Switch Thief Hatch Monitoring System
- Rosemount™ Incus Ultrasonic Gas Leak Detector
- Rosemount 925FGD Fixed Gas Detector
- Rosemount 935 Open Path Combustible Gas Detector

With the EPA's new final rule and tighter greenhouse gas emission guidelines, it is becoming increasingly important to control facility methane emissions. Using new technologies that prevent legacy pneumatic device emissions and super emitter events, Experitec can help you identify and manage your facility's emissions.

Learn How Experitec Can Help You on Your Journey to Net Zero

To understand your current process issues and develop plans to reduce your methane emissions, please contact us.

Experitec has served the industry for over 100 years, partnering with our customers to gain competitive advantages and unlock the hidden potential in their facilities. By optimizing operator and control performance, improving asset reliability, creating safer places to work, and helping clients reach their environmental and sustainability goals, Experitec is dedicated to achieving positive outcomes for the businesses we serve. Our unique long-term partnerships with Emerson and others enable us to connect customers with innovative technologies, subject matter expertise, and 24/7 lifecycle support and engineering services. As employee owners, the Experitec team is eager to partner with you on your next automation or reliability project in a positive, driven, and collaborative way. We have local offices in St. Louis, MO; Kansas City, MO; Memphis, TN; Calvert City, KY; and Decatur, IL; as well as warehouse and service locations in the surrounding areas.

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