



Significant Updates to Chemical Rules You Need to Know: Impacts of the PEPO and CMAS Proposals

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Logistics

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Overview

- ❑ Background
- ❑ PEPO NESHAP
 - Overview
 - Proposed Changes
- ❑ CMAS NESHAP
 - Overview
 - Proposed Changes
- ❑ Monitoring Impacts
- ❑ Impact of U.S. EPA's Deregulatory Agenda
- ❑ Conclusions
- ❑ Questions





Background



Background

- ❑ PEPO – Polyether Polyols, 40 CFR Part 63, Subpart PPP
- ❑ CMAS – Chemical Manufacturing Area Sources, 40 CFR Part 63, Subpart VVVVVV
- ❑ Litigation & Consent Decrees for technology review
 - CMAS: 01/15/2025 (proposal due); 01/15/2026 (final due)
 - PEPO: 12/10/2024 (proposal due); 12/10/2025 (final due)
 - Similar to consent decrees that were issued for HON & Polymers/Resins Rule that were finalized in 2024



Background (continued)

- ❑ Updated Ethylene Oxide (EtO) Risk
 - 2016 Integrated Risk Information System
- ❑ Follows recently completed risk and technology reviews (RTR) for OLD MACT, EMACT, MON, HON, and P&R I/II





Updates to Polyether Polyols (PEPO) NESHAP



PEPO NESHAP Overview

- ❑ What is the PEPO NESHAP?
 - 40 CFR Part 63, Subpart PPP: National Emission Standards for Hazardous Air Pollutants (NESHAP) for the Polyether Polyols (PEPO) Production
 - Regulates the collection of polyether polyol manufacturing process units (PMPUs), and associated equipment located at major sources of hazardous air pollutants (HAPs).

- ❑ What is an RTR?
 - Mandated by CAA, every 8 years for technology review, risk review following promulgation and implementation of rule.



PEPO NESHAP Overview

❑ PEPO NESHAP History

- Promulgated in 1997, amended in 2004
- RTR in 2014 – No revisions under CAA sections 112(f) or (d)(6)

❑ Drivers

- Updated IRIS value for EtO in 2016
- Consent decrees mandating the U.S. EPA complete their reviews



PEPO NESHAP Overview

□ PEPO NESHAP Updates

- On December 27, 2024, U.S. EPA proposed revisions to the PEPO NESHAP.
- The proposed rule separates changes into those associated with the technology review, the risk review, and “other” changes.





PEPO NESHAP Technology Review

- ❑ Technology Review
 - Heat Exchange Systems
 - Process Vents
 - Storage Vessels
 - Equipment leaks
 - Fenceline Monitoring



PEPO NESHAP Technology Review

❑ Heat Exchange Systems

- **New Leak Detection Method:** Modified El Paso Method vs. 40 CFR Part 136 water sampling
- **New Leak Definition:** Leak threshold set at 6.2 ppmv hydrocarbons as methane
- **Repair requirement:** Repair leaks within 45 days, immediate if > 62 ppmv
- **Alternative monitoring option:** Previous monitoring requirements (water sampling) allowed only if ≥ 99 wt% of compounds have Henry's Law Constant $< 5.0\text{E-}6 \text{ atm-m}^3/\text{mol}$





PEPO NESHAP Technology Review

□ Process Vents

- Redefine a Group 1 continuous process vent:
 - ≥ 1.0 lb/hr of organic HAP
 - TRE threshold removed
- For batch process vents:
 - Revise control threshold to 10,000 lb/yr of non-epoxide organic HAP emissions on a combined basis



PEPO NESHAP Technology Review

- ❑ Storage Vessels – Group 1 storage vessels:
 - Lower limit updated from 75 m³ to 38 m³, MTVP lowered from 13.1 to 6.9 kPa
 - Require upgraded deck fitting and controls for guidepoles for all storage vessels equipped with an IFR





PEPO NESHAP Technology Review

❑ Equipment Leaks

- Lower the leak definition for valves in light liquid and gas and vapor service from 500 ppmv to 100 ppmv



PEPO NESHAP Technology Review

- ❑ Fenceline Monitoring
 - Fenceline monitoring will be required for PEPO facilities that use, produce, store, or emit EtO.

- ❑ Will be discussed in additional detail later in webinar



PEPO NESHAP Risk Review

- ❑ Risk Review
 - Process Vents
 - Storage Vessels
 - Heat Exchange Systems
 - Equipment Leaks
 - Wastewater



PEPO NESHAP Risk Review

Source Type	In EtO Service?	Control Requirements	Other
Process Vents	>1 ppmv individually >5 lb/yr combined	Non-flare: 99.9% DRE <1 ppmv <5 lb/yr combined Or to a flare compliant with MACT CC	Non-flare control devices must be tested every 5 years
Storage Vessels	0.1% by weight, material stored	Non-flare: 99.9% DRE <1 ppmv Or to a flare compliant with MACT CC	Non-flare control devices must be tested every 5 years
Heat Exchange Systems	0.1% by weight, process fluid (EtO only)	Weekly monitoring using Modified El Paso	15 day repair time and no delay of repair

PEPO NESHAP Risk Review

Source Type	In EtO Service?	Control Requirements	Other
Equipment Leaks	0.1% by weight, process fluid (EtO only)	Connectors, G/V, LL – Monthly monitoring, 100 ppmv Pumps, LL – Monthly monitoring, 500 ppmv Valves, G/V, LL – Monthly monitoring, 100 ppmv	No skip periods or delay of repair
Wastewater	1 ppmw EtO, annual average, at any flow rate	Must be treated as Group 1 stream and controlled	Cannot be injected into heat exchange systems



PEPO NESHAP “Other” Changes

- ❑ Other changes associated with U.S. EPA’s ‘gap-filling’ exercise in addition to the changes proposed for the risk and technology review include the following:
 - Flares
 - Bypass Lines
 - Maintenance Activities
 - Pressure Vessels
 - Surge Control Vessels and Bottoms Receivers
 - Transfer Operations
 - Add butylene oxide to the list of HAP presented in table 4 to subpart PPP
 - Remove the exemption for reactions/processing that occur after completion of epoxide polymerization and all catalyst removal steps (i.e., solvent removal, purification, drying, and solids handling would require control)



PEPO NESHAP “Other” Changes

Category	Requirement
Flares	*Must comply with Refinery MACT Flare requirements
Bypass Lines	*Bypass is a violation Either *monitoring system, or *must be secured in a closed position
Pressure Vessels	*204.9 kPa exemption has been removed *No longer excluded from definition of storage vessel *Monitoring initially, and annually, 500 ppm leak definition

PEPO NESHAP “Other” Changes

Category	Requirement
Surge Control Vessels and Bottoms Receivers	*Controls consistent with process vents *Floating roof no longer an option for control
Remove exemption of post-polymerization	*Require capture and control of emissions currently unregulated steps (e.g., solvent removal, purification, drying, and solids handling operations)
Maintenance Vents	*SSM exemptions have been removed. *Addition of work practice standards for storage vessel degassing, maintenance, and equipment opening
Transfer Operations	*Adopted definition from HON *98% by weight control, or an outlet concentration of 20 ppmv (HON)
Add butylene oxide to the list of HAP	*Require capture and control of currently unregulated pollutant



PEPO NESHAP Compliance Dates

- ❑ Technology review changes and “other” changes
 - Existing sources – within three years of effective date of final rule
 - New sources – within 60 days of effective date or upon startup, whichever is later
 - Fenceline Monitoring – two years to begin fenceline monitoring, three years to performance RC/CA

- ❑ Risk Review changes
 - Existing sources – within two years of effective date of final rule
 - New sources – within 60 days of effective date or upon startup, whichever is later



PEPO Takeaways

- ❑ **Technology review changes:** lower control thresholds for process vents and storage vessels, lower leak definitions for equipment leaks, a new monitoring method for heat exchange systems, and fenceline monitoring for EO.
- ❑ **Risk review changes:** definitions for “in EO service” and associated control requirements for process vents, storage vessels, equipment leaks, heat exchange systems, and wastewater.
- ❑ **Other changes:** flares, bypass lines, maintenance activities, pressure vessels, surge control vessels and bottoms receivers, transfer operations, butylene oxide, exemption removal



Updates to Chemical Manufacturing Area Sources (CMAS) NESHAP



CMAS NESHAP Overview

❑ CMAS NESHAP History

- Promulgated in 2009
- Amended in 2012

❑ Drivers

- Consent decree deadlines
 - Signed proposed rule by January 15, 2025
 - Final rule by January 15, 2026
- Updated IRIS value for EtO in 2016





CMAS NESHAP Overview

❑ What is CMAS?

- 40 CFR Part 63, Subpart VVVVVV: National Emission Standards for Hazardous Air Pollutants (NESHAP) for Chemical Manufacturing Area Sources (CMAS)
- Currently regulates chemical manufacturing process unit (CMPUs) at 9 chemical manufacturing area source categories



CMAS NESHAP Overview

National Emissions Standards Pollutants – Area Source Standards

Area Source Standard Categories

[Acrylic/Modacrylic Fibers Production](#)

[Aluminum, Copper, and Other Nonferrous Foundries](#)

[Asphalt Processing & Asphalt Roofing Manufacturing](#)

[Carbon Black Production](#)

[Chemical Manufacturing Area Sources \(CMAS\), comprising the following sources:](#)

1. Agricultural Chemicals & Pesticide Manufacturing
2. Cyclic Crude & Intermediate Production
3. Industrial Inorganic Chemical Manufacturing
4. Industrial Organic Chemical Manufacturing
5. Inorganic Pigments Manufacturing
6. Miscellaneous Organic Chemical Manufacturing
7. Pharmaceutical Production
8. Plastic Materials and Resins Manufacturing
9. Synthetic Rubber Manufacturing

[Chemical Preparations Industry](#)

Table 1 to Subpart VVVVVV of Part 63—Hazardous Air Pollutants Used To Determine Applicability of Chemical Manufacturing Operations

As required in § 63.11494(a), chemical manufacturing operations that process, use, or produce the HAP shown in the following table are subject to subpart VVVVVV.

Type of HAP	Chemical name	CAS No.
1. Organic compounds	a. 1,3-butadiene	106990
	b. 1,3-dichloropropene	542756
	c. Acetaldehyde	75070
	d. Chloroform	67663
	e. Ethylene dichloride	107062
	f. <u>Ethylene Oxide</u>	<u>75218</u>
	g. Hexachlorobenzene	118741
2. Metal compounds	h. Methylene chloride	75092
	i. Quinoline	91225
	a. Arsenic compounds	
	b. Cadmium compounds	
	c. Chromium compounds	
	d. Lead compounds	
3. Others	e. Manganese compounds	
	f. Nickel compounds	
	a. Hydrazine	302012



CMAS NESHAP Overview

- ❑ What is GACT?
 - U.S. EPA standards for area sources under CAA 112(d)(5), utilizing cost-effective and commercially available methods to reduce HAPs
 - GACT standards are typically less stringent than MACT

CMAS NESHAP Overview

❑ CMAS NESHAP Updates

- On January 22, 2025, U.S. EPA proposed revisions to the CMAS NESHAP
- New source category – “Chemical Manufacturing with Ethylene Oxide”
- Proposed changes include new GACT standards for EtO, additional GACT standards for non-EtO, and revisions based on technology review.





CMAS NESHAP EtO GACT

- ❑ EtO GACT to Address Risk
 - Storage Vessels
 - Process Vents
 - Heat Exchange Systems
 - Wastewater Systems
 - Equipment leaks
 - PRD
 - Pressure Vessels
 - Fenceline Monitoring



CMAS NESHAP EtO GACT

Source Type	In EtO Service?	Control Requirements	Other
Process Vents	>1 ppmv individually >5 lb/yr combined	Non-flare: 99.9% DRE <1 ppmv <5 lb/yr combined Or to a flare compliant with MACT CC	Non-flare control devices must be tested every 5 years
Storage Vessels	0.1% by weight, material stored	Non-flare: 99.9% DRE <1 ppmv Or to a flare compliant with MACT CC	Non-flare control devices must be tested every 5 years
Heat Exchange Systems	0.1% by weight, process fluid (EtO only)	Quarterly monitoring using Modified El Paso	15 day repair time and no delay of repair

CMAS NESHAP EtO GACT

Source Type	In EtO Service?	Control Requirements	Other
Equipment Leaks	0.1% by weight, process fluid (EtO only)	Connectors, G/V, LL – Monthly monitoring, 100 ppmv Valves, G/V, LL – Monthly monitoring, 100 ppmv Pumps, LL – Monthly monitoring, 500 ppmv	No skip periods or delay of repair
Wastewater	1 ppmw EtO, annual average, at any flow rate	Must be treated as Group 1 stream and controlled	Cannot be injected into heat exchange systems



CMAS NESHAP EtO GACT

Source Type	In EtO Service?	Control Requirements	Other
Pressure Release Devices	0.1% by weight	Instrument monitoring, 500 ppmv; Preventive measures and corrective actions after releases	Any release would be a violation
Pressure Vessels	0.1% by weight, any capacity	Annual monitoring, > 500 ppm is a violation	Excludes equipment in EtO service
Flares used to comply with process vent and storage vessel EtO control		Refinery Sector Rule (40 CFR Part 63, Subpart CC) flare requirements	





CMAS NESHAP Additional GACT non-EtO

❑ PRD

- Not routed to a control device
 - Monitoring system to alert when a PRD release occurs
 - Three redundant preventive measures
 - Root cause and corrective action after any release
 - Limit releases to 1-2 releases per 3-year periods





CMAS NESHAP Additional GACT non-EtO

❑ Closed Vent System – Bypass Lines

- Any bypass is a violation
- Monthly inspections per 40 CFR Part 63, Subpart SS, but analyzer vents and high point bleeds are no longer exempt
- Open-ended valves or lines that use a cap, blind flange, plug, or second valve are exempt from bypass monitoring



CMAS NESHAP Additional GACT non-EtO

□ Pressure Vessels

- Proposed to remove exemption for vessels > 204.9 Kpa
- Storing organic HAP with capacities of 20,000 gallons or more:
 - Monitoring initially, and annually, > 500 ppm is a violation.
 - Excludes equipment in EtO service (connectors, G/V/LL valves, LL pumps), and G/V/LL valves/connectors covered by LDAR provisions.
- Operate as a closed system routed to control. PRD releases would be a deviation.





CMAS NESHAP Technology Review

❑ Equipment Leaks

- Annual LDAR using Method 21 for valves and connectors in G/V/LL, and pumps in LL service
- 10,000 ppmv leak definition
- First attempt at repair in 5 days and repair required by 15 days
- DOR allowed under certain conditions (HON Delay of Repair)



CMAS NESHAP Technology Review

❑ Process vents

- Remove the 50 ppmv metal HAP threshold in the definition of a “Metal HAP process vent.”



CMAS NESHAP Technology Review

❑ Heat Exchange Systems

- Removal of the leak monitoring exemptions for once-through heat exchange systems meeting certain National Pollutant Discharge Elimination System (NPDES) permit conditions.
- For heat exchange systems with a maximum cooling water flow rate of 8,000 gallons per minute or less:
 - Monitoring using Modified El Paso Method with a leak definition of 6.2 ppmv
 - Quarterly monitoring preceded by an initial monthly 6-month period
 - Establishes a delay of repair action level of 62 ppmv. If this value is exceeded, delay of repair cannot be used beyond 30 days.



CMAS NESHAP Compliance Dates

- ❑ Technology review changes and non-EtO GACT changes
 - Existing sources – within three years of effective date of final rule
 - New sources – within 60 days of effective date or upon startup, whichever is later
 - Fenceline Monitoring – two years to begin fenceline monitoring, three years to performance RC/CA

- ❑ EO changes
 - Existing sources – within two years of effective date of final rule
 - New sources – within 60 days of effective date or upon startup, whichever is later





CMAS Takeaways

- ❑ **EtO GACT changes:** fenceline monitoring and definitions for “in EO service” and associated control requirements for process vents, storage vessels, equipment leaks, heat exchange systems, wastewater, PRDs, pressure vessels, and flares.
- ❑ **Non-EtO GACT changes:** PRDs, closed vent systems, pressure vessels
- ❑ **Technology review changes:** equipment leaks, process vents, heat exchange systems.





Monitoring

Monitoring Impacts

- ❑ Proposed monitoring revisions of the PEPO and CMAS NESHAP
 - Fenceline Monitoring
 - Modified El Paso Method
 - Flare Monitoring





Fenceline Monitoring

- ❑ U.S. EPA is proposing EO fenceline monitoring for PEPO and CMAS facilities:
 - Canister Sampling – 5 Day Sampling Periods
 - 24-hour canister sampling for ethylene oxide
 - Propose to follow U.S. EPA Method 327
 - Once every 5 days at 8 sampling locations
 - Siting of the canisters will follow NESHAP Subpart H



Fenceline Monitoring

- ❑ U.S. EPA is proposing use of Method 325 for delta C calculation
- ❑ Proposed action levels:
 - 0.2 $\mu\text{g}/\text{m}^3$ (0.111ppbv) – Ethylene oxide
- ❑ Reporting, root cause analysis, and corrective action proposed to follow U.S. EPA Method 325

Fenceline Monitoring Considerations

- ❑ Costs and labor associated with sampling frequency and RCA
- ❑ Electronic reporting requirements
- ❑ False Positives of EtO
- ❑ Availability of canisters and lab capacity
- ❑ Ambiguity of the proposed rule





Modified El Paso Method

- ❑ For heat exchange systems not in ethylene oxide service:
 - Modified El Paso Method with leak definition of 6.2 ppmv
 - Quarterly monitoring preceded by an initial 6-month period where monitoring is conducted monthly
 - Leaks must be repaired no later than 45 days after discovery
 - Establishes a delay of repair action level of 62 ppmv
 - If exceeded, delay of repair cannot be used beyond 30 days





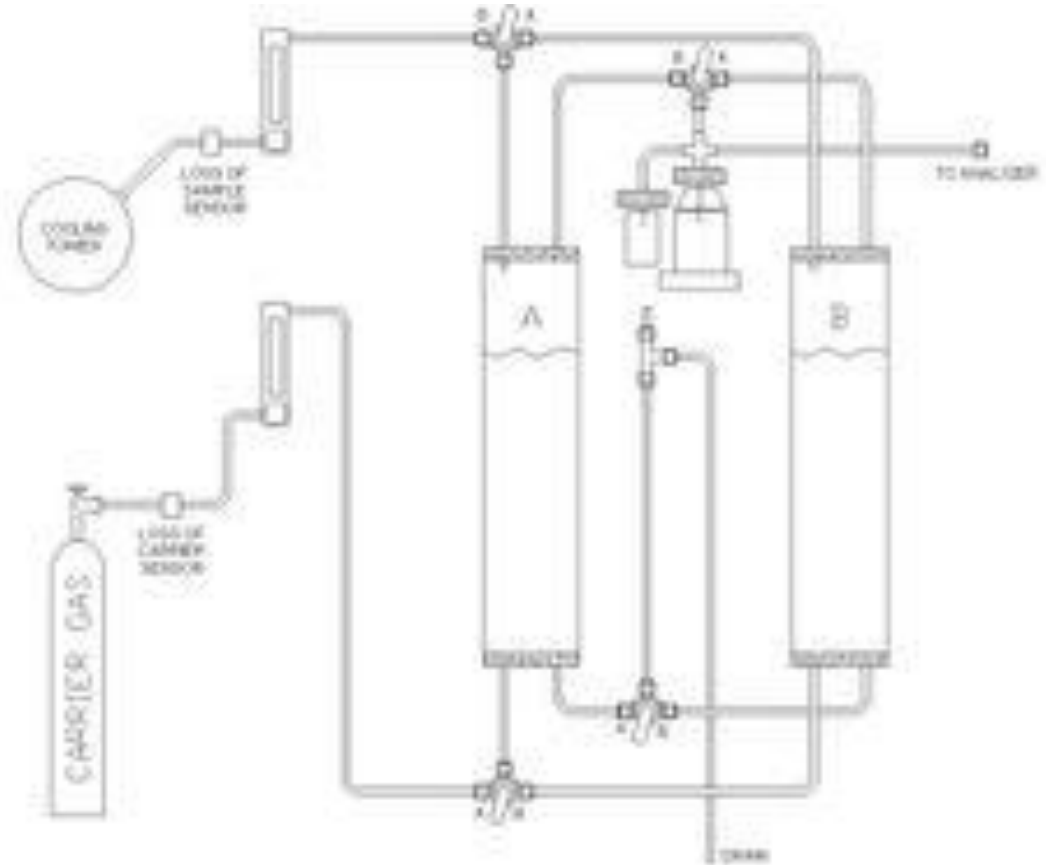
Modified El Paso Method

- ❑ For heat exchange systems in ethylene oxide service:
 - Modified El Paso Method with leak definition of 6.2 ppmv
 - Monitoring
 - PEPO: Weekly
 - CMAS: Quarterly
 - Leaks must be repaired within 15 days and no delay of repair is allowed



Modified El Paso Method Considerations

- ❑ Costs associated with increased monitoring frequency and tighter leak repair timelines
- ❑ Equipment procurement challenges
- ❑ Leak repair timeline challenges





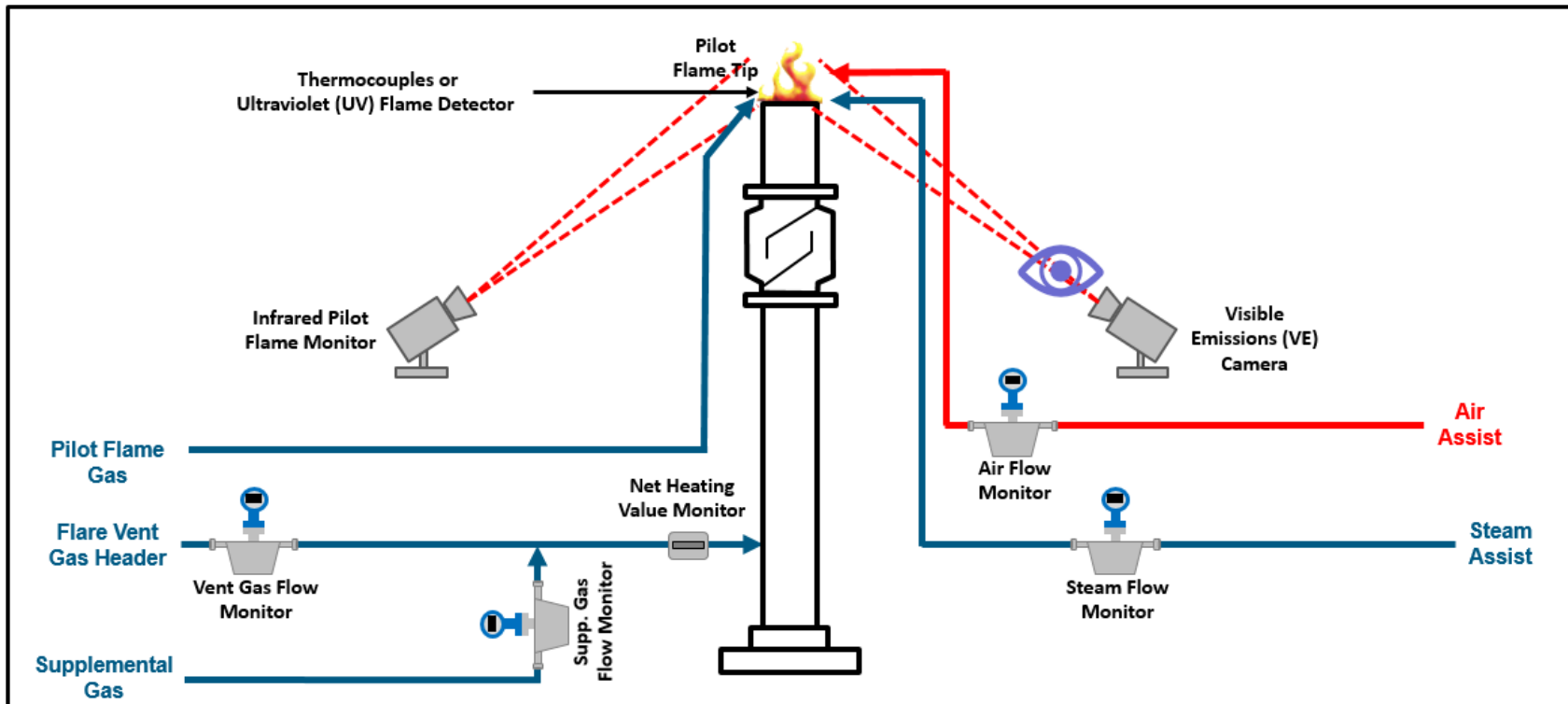
Flare Monitoring

- ❑ Flare monitoring according to 40 CFR Part 63, Subpart CC (Refinery MACT)
- ❑ Includes:
 - Pilot flame presence
 - Visible emissions
 - Tip velocity (V_{tip})
 - Combustion Zone Net Heating Value (NHV_{cz})
 - Net heating value dilution parameter (NHV_{dil}) for flares with perimeter assist air



Flare Monitoring Considerations

- ❑ Vendor Resources to design, install, and certify
- ❑ System verification and troubleshooting
- ❑ Determining roles and responsibilities





U.S. EPA's Deregulatory Agenda

- ❑ U.S. EPA's deregulatory agenda announced on March 12, 2025.
 - Includes reconsideration of a number of regulations that were finalized during the Biden Administration.
- ❑ Watching HON Reconsideration closely (submitted early 2025), as those requirements are the basis for what has been proposed for CMAS and PEPO.
 - **EO:** Second risk review, IRIS value concerns, establishing thresholds for in EO service, delay of repair, reduced monitoring frequencies for equipment in EO service, connector monitoring, and PRD releases.
 - **Fenceline monitoring provisions:** authority to mandate, applicability criteria, EO action level, and sampling logistics.
 - **Process vents:** New Group 1 criteria, removal of TRE index value, surge control vessels and bottoms receivers.

U.S. EPA's Deregulatory Agenda (cont.)

- ❑ Concerns on CMAS and PEPO proposals:
 - PEPO
 - HON reconsideration petition items
 - Removal of extended cook-out option for process vents in EO service
 - Removal of exemption for reactions or processing that occur after completion of epoxide polymerization and all catalyst removal steps
 - Compliance timeline
 - CMAS
 - HON reconsideration petition items
 - Maintenance wastewater EO requirements
 - Control requirements for EO from process vents and storage vessels

Webinar Key Takeaways

- ❑ Major changes to requirements for PEPO and CMAS facilities.
 - May need to spend capital to comply, including control devices and new monitoring systems.
- ❑ Expected final rules by December 2025 and January 2026
 - Start preparing now, don't rely on deregulatory agenda and reconsideration.





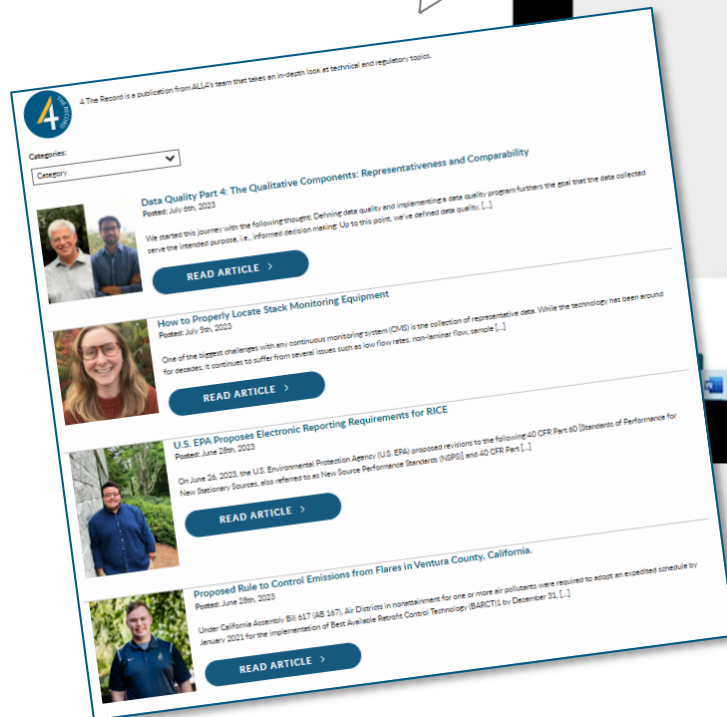
What's Next?

- ❑ ALL4 is helping clients identify impacts, next steps, and potential costs associated with these changes.
- ❑ For your facility, a review of all affected sources and a compliance demonstration plan will be required.
- ❑ If you have, or think you have, EO, plan to do some investigative sampling.
- ❑ Once rule changes are finalized, permits will need to be revised.
- ❑ Plan early for monitoring and equipment.

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Questions or Comments?

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