EMISSIONS REDUCTION
OOOO(B)

GUIDE

OOOO(b) FOR COMPRESSION SITES

COST-MANAGEMENT STRATEGIES FOR METHANE REDUCTION

CANUSA EPC

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SUMMARY

The EPA's latest methane rule – OOOO(b) – mandates zero-emission process controllers and pneumatic pumps, pushing gas compression facilities to invest in compliance projects. Want to ensure you meet budget and timelines? Read on for 7 strategies to consider in your compliance project program.

This guide includes:

- Article, published in Hart Energy Magazine, discussing instrument air conversions, OOOO(b) planning and best practices, achieving operational efficiencies, and moving forward with compliance
- Matrix highlighting OOOO(b) requirements of key devices found in compressor stations: dry seal compressors, controllers, pumps, vessels, fugitive emissions
- Decision-making flow diagrams to help you determine which OOOO(b) sub-parts pertain to your operation

HIGHLIGHTS

- Applicable compliance dates
- Execution strategies to condense schedule & save cost

CONNECT

CAN: 403-723-4256
USA: 833-744-4887
info@canusaepc.com
Linkedin.com/company/CANUSAEPC

Navigating OOOO(b):

Methane Emission Reduction Cost-Management Strategies for Compression Sites

Gas compression facilities in the USA must adapt to the EPA's latest methane regulations (Final Rule1), Subpart OOOO(b), which mandate significant reductions in methane emissions from key equipment. Executing emission reduction projects presents opportunities to leverage a strategic approach to engineering, procurement, and construction (EPC) to maintain cost efficiency.

What is OOOO(b) Compliance?

The EPA's OOOO(b) Rule is a major regulatory update aimed at curbing methane emissions from oil and gas operations. The EPA's Rule mandates "strict performance standards for new, modified, and reconstructed sources".

For gas compression facilities, compliance requires a shift in operational practices. There are three distinct applications that apply:

Process Controllers & Pneumatic Pumps

Natural gas-driven controllers and pneumatic pumps, which historically vented methane into the atmosphere, must be replaced with zero-emission alternatives (IE. instrument air-driven controllers).

Dry Seals for Compressors

Dry-seal centrifugal compressors must maintain a volumetric flow rate at or below 10 standard cubic feet per minute (scfm) per compressor seal to minimize emissions.

Storage Vessels/Tank Batteries

Storage tanks at compression stations must now achieve a 95% reduction in methane and VOC emissions, significantly changing how operators manage emissions control systems.

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Compliance Dates with EPA 40 CFR Part 60, Subpart OOOO

Originally published in December 2023, EPA's Final Rule(1) provided lead time for industry to comply. This subpart establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO_2) emissions from affected oil and gas facilities that commence construction, modification, or reconstruction after December 6, 2022.

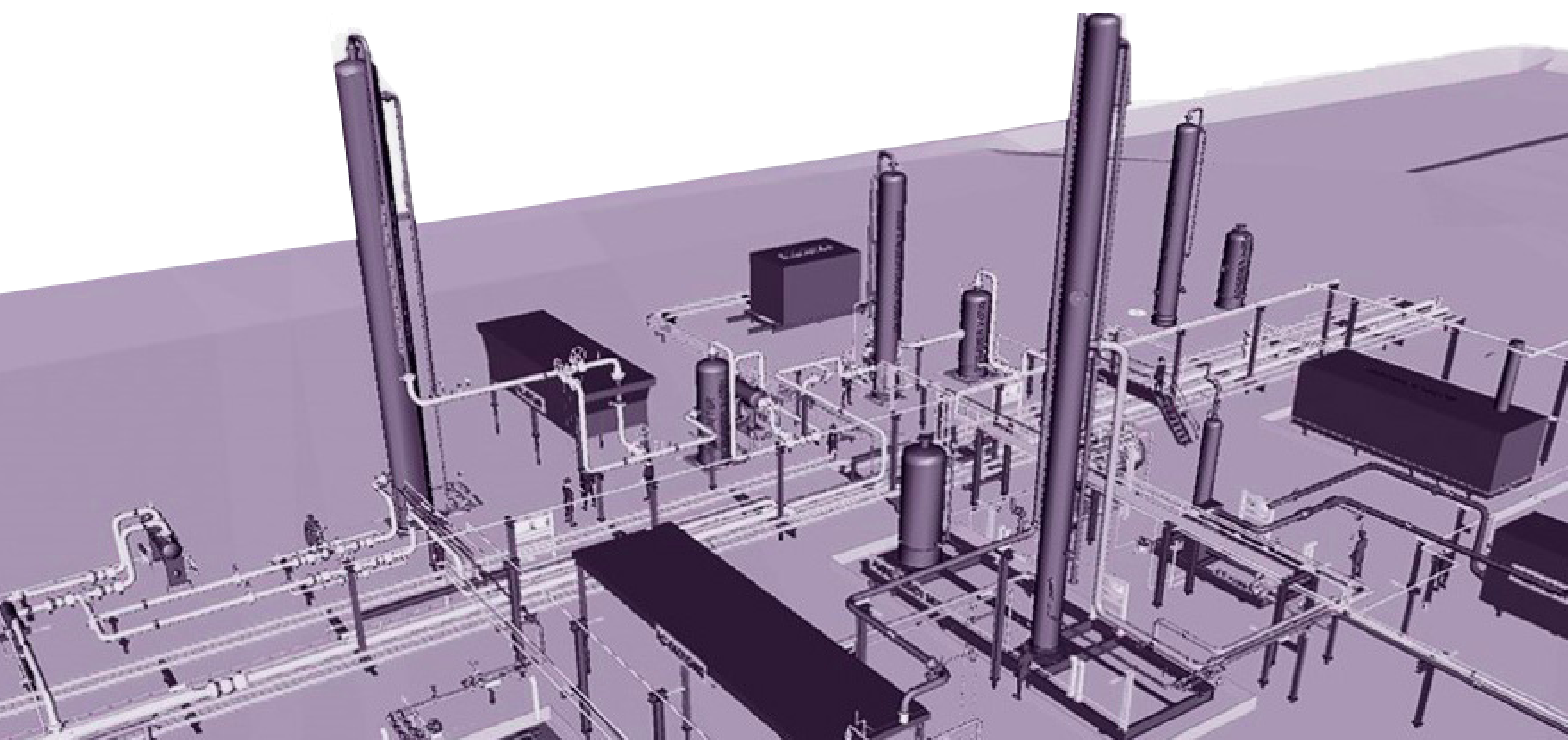
Compliance with the new performance standards is stated in section 60.5370b2. "You must be in compliance with the standards of this subpart no later than May 7, 2024, or upon initial startup, whichever date is later, except as specified per…."

This deadline has forced operators to focus on upgrades in an accelerated manner. With the right plan in place, you can realize cost savings and operational efficiencies.

Long-Term Benefits & Regulatory Compliance

For gas compression facilities, the implementation of OOOO(b) compliance measures satisfies regulatory requirements and creates opportunities for operational efficiencies.

Companies that invest in structured IG-to-IA conversion programs, bulk material procurement, and standardized engineering designs will benefit from reduced compliance costs, improved environmental performance, and increased asset reliability.



Instrument Air Conversions: Save Time & Money

Converting from instrument gas to instrument air across multiple sites is a capital-intensive process. In a recent methane reduction project, CANUSA EPC achieved substantial cost savings and accelerated schedule for their operator using these strategies.

1

Develop a Compliance Program

Project Manager, Josh Hoeft, explains "the most cost-effective approach is to develop a Compliance Program – a structured, regional approach where you select a preferred EPC firm, issue a bulk order on IA package for volume discounting and guaranteed delivery schedules, and contract a regional construction firm familiar with the sites. This eliminates redundancies, reduces costs, and streamlines your path to compliance."

2

Template-Based Engineering

"Experienced EPCs should be utilizing a template-based approach to engineering – a copy-paste design format across facilities. This approach:

- Expedites execution,
- Minimizes engineering re-work, and
- Ensures uniformity in documentation for installation

At CANUSA EPC, we've realized reduced engineering costs by up to 25% per site when we execute a Compliance Program on multiple sites (as compared to a single site)," says Hoeft.

3

Package Negotiations

Bulk procurement of IA systems can result in total project cost reductions of 10%.

A Compliance Program recognizes savings on the purchase price of equipment, and the schedule for delivery can also be staggered – allowing the engineering and construction team to streamline their engagements to reduce demobilization costs.

Lessons learned from the first or second installation are incorporated into the execution plan. Every future installation becomes more efficient, creating a 'snowball effect'. When executing multiple sites concurrently, you do not realize these benefits.

4

Single-Sourced Contractor

Having a dedicated contractor on multiple sites will improve efficiencies for scope development and allow the contractor to remove risk from their estimates, resulting in site costs that finish on budget. Contractors can develop a plan to support operations and minimize downtime, which often is the largest cost for these compliance projects – missed operating revenue.

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OOOO(b) Planning & Operational Efficiencies

From past compliance projects, CANUSA EPC has found critical execution aspects that impact schedule and add risk to project costs.

Engaging Utilities Early

Electrical power capacity and availability must be analyzed early. This determines whether the existing electrical infrastructure (on site and from the utility) can accommodate the new loads required for OOOO(b) projects.

Electrical utilities are often backlogged. Requesting new/upgraded services or electrical equipment, like transformers, can result in long and unexpected lead items. It can take several months for the local power provider to run a new power line or install a new bucket transformer if the utility is the limiting factor. Engaging utilities early in the design process can prevent significant delays.

Involve Site Operations in Design

From an engineering perspective, early and continuous engagement with operations personnel is critical. Facility staff possess in-depth knowledge of site-specific factors – existing infrastructure, space constraints, and potential integration challenges. Their input optimizes pipe routing, equipment placement, and ensures IA systems are designed with future facility expansions in mind.

Since operators are responsible for routine inspections and emissions monitoring, their early input ensures new systems are both practical and sustainable.

If your EPC is not involving your operations team from the outset, you may lose foresight on site functionality, long-term maintenance, and accessibility. Collaboration also helps your EPC understand operational priorities, reducing the risk of installing systems that require extensive modifications after deployment.

Planning for Reduced Downtime and Increased Reliability

Facility outages and prolonged downtime affect your bottom line. Engaging operations will plan for final mechanical tie ins and reduce facility downtime. On-site staff are knowledgeable about which equipment is critical for continued operation and can provide tie in plans that may avoid a facility shutdown. If electrical tie ins require energy isolation, affecting critical equipment like the station PLC, developing a temporary power plan using a generator can be a viable option to keep the station running during the tie ins.

Abnormal operation of natural gas facilities – during start-ups and shutdowns – present the most hazardous operating scenarios when compared to steady state operation. Avoiding facility shutdowns altogether helps mitigate unsafe operating conditions.

Moving Forward with Compliance

Are you confident about what deadlines apply to your facilites?

CANUSA EPC has created this OOOO(b) Guide to help you gain clarity on what EPA Methane Rules apply to your compression operations.

1. Simplified EPA Matrix focusing only on dry seals, pumps, storage vessels, fugitive emissions, and process controllers.

2. Decision-making diagrams to guide you on what OOOO(b) sub-rules are pertinent – dry seal venting of centrifugal compressors, gas pneumatic devices, fugitive emissions, storage vessel, and pumps.

3. Project Profiles detailing specific approaches for dry seal capture, tank venting emissions reduction, and IG-to-IA conversion.

OOOO(b) REQUIREMENTS

DRY SEAL COMPRESSORS, CONTROLLERS, PUMPS, VESSELS, FUGITIVE EMISSIONS

The table below highlights OOOO(b) requirements of key devices found in compressor stations.

This table has been adapted from its original source (EPA), and it summarizes the emissions requirements for new and existing sources of Methane and VOC emissions. Compliance dates and requirements vary by device.

Covered Source	Final NEW Source Performance Standards (NSPS) for Methane and VOCs	Final Presumptive Standards for Methane for EXISTING Sources	Deadlines for Compliance
Dry Seal Centrifugal Compressors (except for those located at well sites)	Monitoring and repair of seal to maintain volumetric flow rate at or below 10 scfm per compressor seal	Same as NSPS	Whichever date is later: • On or before 8,760 hours of operation after May 7, 2024 • On or before 8,760 hours of operation after last seal replacement • On or before 8,760 hours of operation after startup
Process Controllers: Natural Gas-Driven	VOC and GHG (methane) emission rate of zero	GHG (methane) emission rate of zero	May 7, 2025
Pumps: Natural Gas-Driven.	GHG (methane) and VOC emission rate of zero.	Methane emission rate of zero	May 7, 2025
Storage Vessels: A Single Storage Vessel or Tank Battery with PTE of 6 tpy or more of VOC or PTE of 20 tpy or more of Methane	95 percent reduction of VOC and methane.	95 percent reduction of methane	Must comply at startup
Fugitive Emissions	• Monthly AVO surveys. First attempt at repair within 15 days after detecting fugitive emissions. Final repair within 15 days after first attempt. AND • Quarterly OGI monitoring. (Optional quarterly EPA Method 21 monitoring with 500 ppm defined as a leak). • First attempt at repair within 30 days after detecting fugitive • emissions. Final repair within 30 days after first attempt.	Same as NSPS	Have been in effect since May 7, 2024

Source: https://www.epa.gov/system/files/documents/2023-12/summary-of-key-requirements-table.pdf

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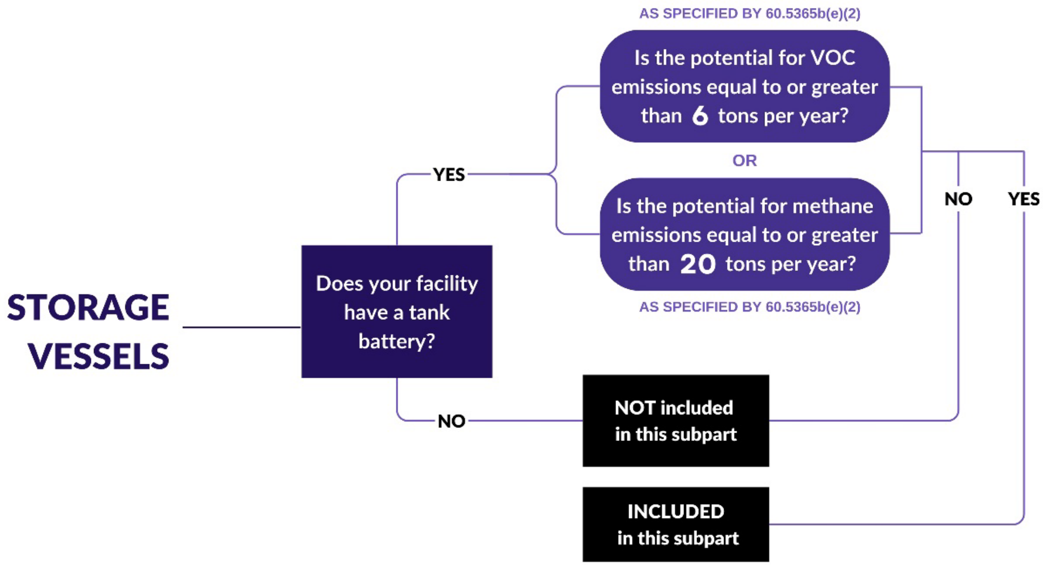
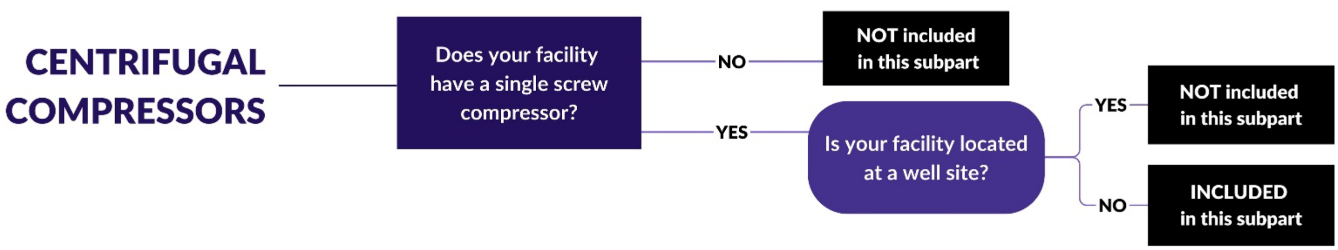
OOOO(b) – DECISION-MAKING FLOW DIAGRAM

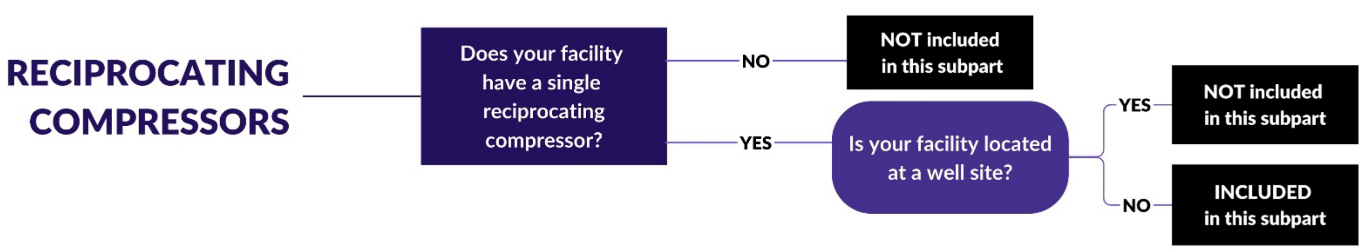
COMPRESSOR STATION DEVICES

Use these flow diagrams to determine whether a device located at your compressor station is subject to OOOO(b).

In general, facilities that are in the Crude Oil and Natural Gas source category, as defined by subpart 60.5430b, are subject to OOOO(b) if there has been construction, modification, or reconstruction after December 6, 2022.







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OOOO(b) – DECISION-MAKING FLOW DIAGRAM

COMPRESSOR STATION DEVICES

PROCESS UNIT EQUIPMENT

- Is your compressor station located at an onshore natural gas processing plant?
  - YES → **INCLUDED** in this subpart
  - NO → **NOT included** in this subpart

PROCESS CONTROLLERS

- Are your process controllers driven by natural gas?
  - NO → **NOT included** in this subpart
  - YES → Do they function as emergency shutdown devices?
    - NO → **INCLUDED** in this subpart
    - YES → **NOT included** in this subpart

PUMPS

- Are your pumps driven by natural gas?
  - NO → **NOT included** in this subpart
  - YES → Are your pumps in operation for more than 90 days per calendar year?
    - NO → **NOT included** in this subpart
    - YES → **INCLUDED** in this subpart

DEVELOP A PROGRAM & ENSURE COMPLIANCE

If your gas compression facilities require upgrades/conversions, connect with CANUSA EPC for a 30-minute consultation.

We will help you determine your next steps.
https://canusaepc.com/contact/

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IG to IA Conversion – Methane Reduction

OOOO(b) Compliance in Natural Gas Facilities

LOCATION Oklahoma, USA
MARKET Emissions Reduction / OOOO(b)

VIEW SIMILAR PROFILES

THE CHALLENGE

The Client needed to convert the instrument gas devices at (4) natural gas compression facilities in Oklahoma to instrument air service in a 6-month period.

OOOO(b) requires that process controllers emit no identifiable emissions. Instrument air systems are inherently emissions free, so they are not subject to requirements specified in subpart 60.5390b.

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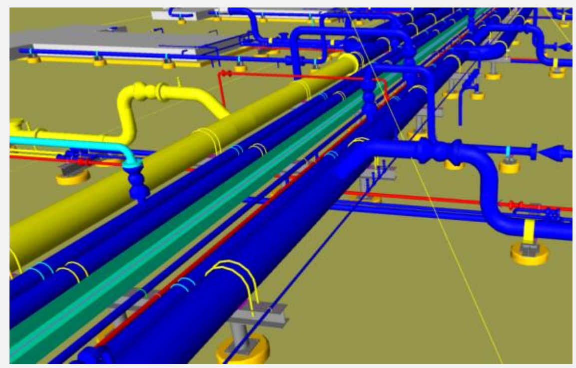
Instrument Air
Project: USA0106 | Date: January 9, 2023

Client: MPLX
Project Name: Loyal CS IA Upgrades
Supplier: TBD
Document No.: USA0106-000-IAC-0001
Revision: A

Equipment / Area	Tag	PID	Control Valves (SCFM)			Pumps (SCFM)		
			Quantity	Usage	Total	Quantity	Usage	Total
Inlet Separator	V-001	0001A	4	0.50	2.00	0	5.00	0.00
Fuel Gas Scrubber	V-002	0001B	3	0.50	1.50	0	5.00	0.00
Compressor Header Area	-	0002	6	0.50	3.00	0	5.00	0.00
Compressor	CM-2001	0002A	8	0.50	4.00	0	5.00	0.00
Compressor	CM-2002	0002B	8	0.50	4.00	0	5.00	0.00
Compressor	CM-2003	0002C	8	0.50	4.00	0	5.00	0.00
Compressor	CM-2007	0002D	8	0.50	4.00	0	5.00	0.00
Compressor	CM-2008	0002E	8	0.50	4.00	0	5.00	0.00
Compressor	CM-2009	0002F	8	0.50	4.00	0	5.00	0.00
Compressor	CM-2004	0003A	8	0.50	4.00	1	5.00	5.00
Compressor	CM-2005	0003B	8	0.50	4.00	0	5.00	0.00
Compressor	CM-2006	0003C	8	0.50	4.00	1	5.00	5.00
Compressor	CM-2010	0003D	10	0.50	5.00	1	5.00	5.00
Compressor	CM-2011	0003E		0.50	0.00	0	5.00	0.00
Compressor	CM-2012	0003F		0.50	0.00	0	5.00	0.00
Fuel Gas Buffer	V-010	0004	2	0.50	1.00	0	5.00	0.00
Compressor	CM-2013	0004A	8	0.50	4.00	1	5.00	5.00
Trim Cooler/Coalescer	AC-001/F-001	0005	3	0.50	1.50	0	5.00	0.00
Glycol Contactors	V-004A/B	0005A	2	0.50	1.00	0	5.00	0.00
After Separator	V-005	0005B	1	0.50	0.50	0	5.00	0.00
Discharge & HPGL	-	0005B	4	0.50	2.00	0	5.00	0.00



THE SOLUTION

CANUSA EPC conducted site visits to audit all the instrument gas users at the facility, as-build the P&IDs for IA users, and validate facility electrical capacity to add an instrument air skid. Sizing requirements for the instrument air compressor skid were provided to account for all users and start air for the natural gas compressors.

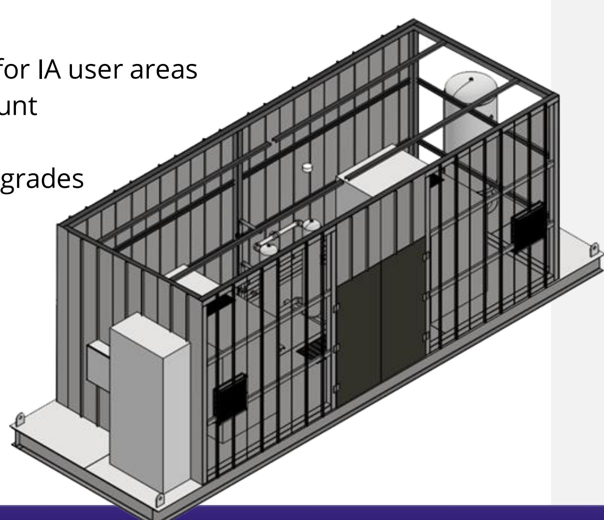
The design and construction packages were executed in sequential order to meet accelerated schedule deadlines.

Engineering

- Walk down (4) facilities
- Instrument demand study
  - Start air evaluation
- Instrument air skid specifications
  - Dual compressor design for
- Recommend electrical upgrades

Design

- Isometric riser details for IA user areas
- Header design to account for future start air
- Electrical and utility upgrades



THE RESULTS

Reduction in fugitive emissions and venting from previous IG users and compression start-up

- Successfully achieved reduction of all instrument gas users
- Calculated emissions reduction of 153 MTPY of methane
- Compliance with OOOO(b) section 60.5390b
- 25% reduction in engineering design on a site basis

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Tank Venting Emissions Reduction

OOOO(b) Compliance in Natural Gas Facilities

LOCATION Harrison County, TX
MARKET Emissions Reduction / OOOO(b)

VIEW SIMILAR PROFILES

THE CHALLENGE

The Client was venting excessive vapors from their produced water tank battery due to higher operating pressure in their inlet separator.

Operations had determined that the pressure drop between the slug catcher and the storage tank was resulting in entrained gas venting above OOOO(b) limits.

THE SOLUTION

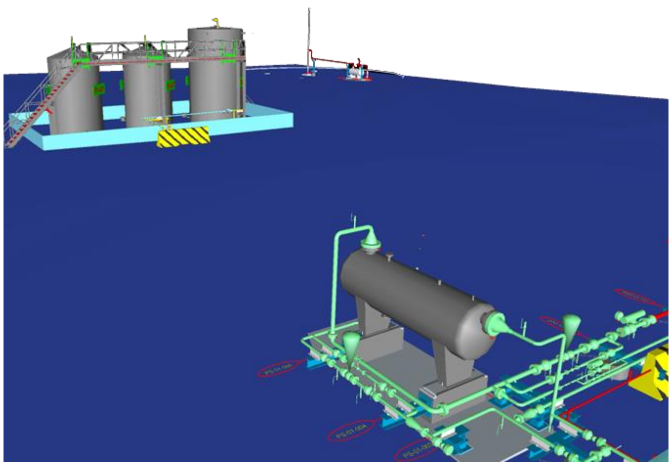
CANUSA EPC provided engineering and design to install an emission control device. An intermediate knockout drum and combustor were added to the facility. Liquids were routed from the slug catcher to the lower-pressure intermediate knockout, allowing more gases to flash off before sending the remaining liquids to the water tanks. All flashed gases were sent to the combustor.

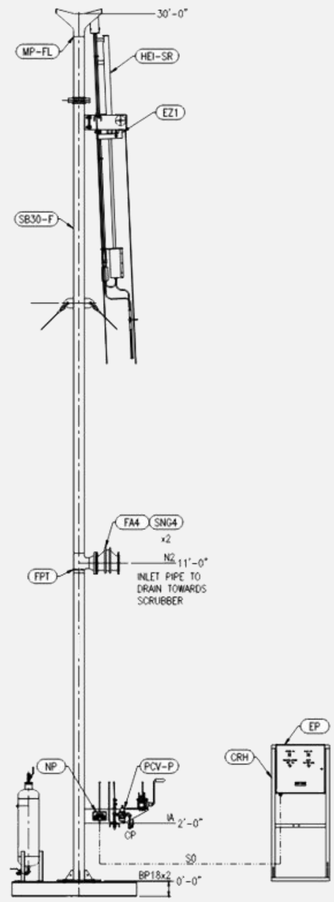
Engineering

- Flare specification
- Re-purposed knockout drum evaluation
- Instrumentation and control systems added
- Saddle design and flare guy wire anchoring solution

Design

- 3D Modeling of piping, structural steel, and foundations
- Piping isometrics
- Pipe support and foundation details





THE RESULTS

Reduction in vented vapors from the tank battery

- Reduced direct venting methane by 10 TPY
- Alternative solution for recycle of entrained gas to inlet
- Compliance with OOOOb section 60.5365b(e)

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TURBINE SEAL GAS CAPTURE

METHANE EMISSION REDUCTION

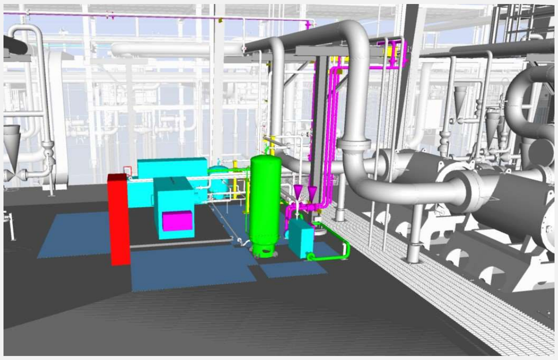
VIEW SIMILAR PROFILES

LOCATION Greeley, CO
MARKET Emissions Reduction / ESG

THE CHALLENGE

The Client agreed to mitigate emissions from turbine units seal gas system at one of their compression sites to satisfy an EPA consent decree regarding the Clean Air Act and the Colorado Air Pollution Prevention and Control Act.

Per the terms of the agreement, the Client was required to install a seal gas capture system within 90 days of receiving the dry seal recompression unit.



THE SOLUTION

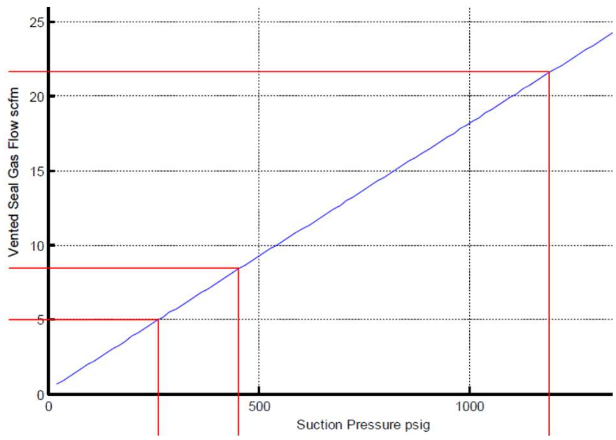
CANUSA EPC worked with the Client and packager of the dry seal recompression system to develop an engineering and design package for the installation of the system.

Multi-Discipline Engineering

- Electrical tie-in of 40 HP Motor
- PSV sizing for new relief scenarios
- Piping modeling for discharge into plant inlet to recover the gas
- Automation design to integrate with station controls

Procurement

- VFD and Cable specification
- Pressure Instrumentation
- Construction Bid Walkdowns



THE RESULTS

Deployed the first seal gas system in the fleet

- Installation of a single capture unit for seal gas of two turbine units

Reduction in fugitive methane emissions

- Reduction in venting emissions of 49.3 mton of CO2e/day

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