

Environmental Updates & Methane Control



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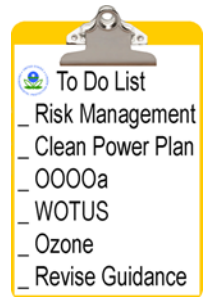
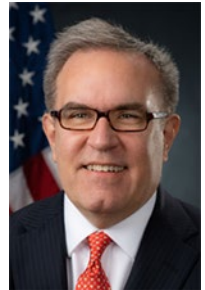
Westerville, OH 43086

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Federal Updates

U.S. Environmental Protection Agency (EPA)

- Administrator Andrew Wheeler confirmed Feb. 28, 2019
 - Served as Acting Administrator since Jul. 5, 2018
 - Previous EPA employee
 - Worked in various staff positions for U.S. Senate
 - Energy lobbyist for Faegre Baker Daniels
- Working on a long list of regulatory reconsiderations
 - Chemical Accident Prevention Provisions
 - Clean Power Plan
 - Oil and Gas Standards
 - Waters of the United States
- Issuing final ozone non-attainment designations
- Revising agency guidance and guidelines



Federal Updates

Chemical Accident Provisions (Risk Management Plans)

- New provisions to regulation published Jan. 13, 2017
- EPA delayed implementation by extending compliance date
 - EPA stayed all compliance provisions for reconsideration
 - Court of Appeals for the D.C. Circuit (DCCA) vacated stay
 - Compliance provisions effective Sep. 21, 2018
- EPA proposed removing some provisions on May 30, 2018
 - EPA plans to keep some of the new provisions
 - Emergency planning & response agency coordination
 - Public notification of available information
 - Public meeting following accident

Federal Updates

Chemical Accident Provisions (Risk Management Plans)

- Immediately applicable provisions:
 - Annual coordination with county Emergency Management Agency (EMA) and local fire department
 - Incident investigations
 - Now include “near miss”
 - Must be conducted within 12 months of the incident
 - Investigative teams must be comprised of persons with appropriate knowledge and experience
 - Additional reporting requirements
 - Include findings from incident investigations in planning
 - Keep process safety information up-to-date



Federal Updates

Clean Power Plan

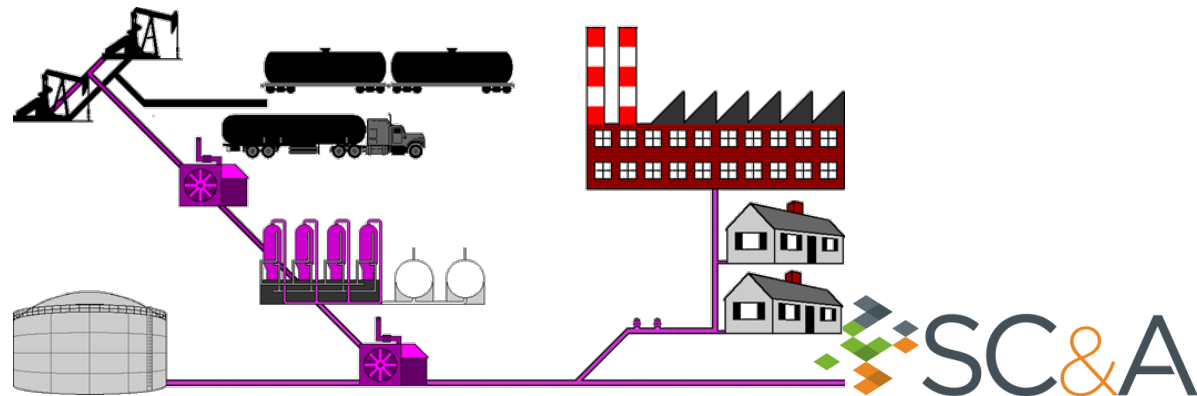
- EPA has proposed a repeal of the Clean Power Plan
 - Complete removal of the regulation for existing sources
 - New sources installed on or after Jan. 8, 2014 still subject to emissions limits
 - Supreme Court had issued a stay on Feb. 9, 2016
 - DCCA heard arguments in Sep. 2016, but has not ruled
 - EPA keeps requesting a delay on case, since it is repealing the regulation
- EPA has proposed Affordable Clean Energy (ACE) Rule
 - Requires boiler efficiency instead of state-by-state GHG emissions targets



Federal Updates

Oil and Gas Standards

- EPA is modifying parts of Title 40 of the Code of Federal Regulations, Part 60 (40 CFR 60), Subpart OOOOa
 - EPA issued a stay to delay compliance dates
 - DCCA vacated EPA stay
- EPA proposal
 - 6 month compressor station leak detection (from 3 month)
 - Final repair within 60 days (from 30 days)
- EPA will continue to consider “broad policy issues” about regulating GHGs from the oil and gas sector, at a later date



Federal Updates

Waters of the United States

- Definition of “Waters of the U.S.” expanded in 2015
 - Added new categories of waterbodies to Clean Water Act
 - Expanded list of excluded ponds
- EPA and Army Corps of Engineers are jointly proposing to repeal the 2015 rule and return to pre-2015 definition
 - May allow states to develop datasets of waters
- Various U.S. District Courts upheld or vacated 2015 rule
 - Ohio uses 2015 rule



Ohio Updates

Ohio Environmental Protection Agency

- Laurie Stevenson appointed Director Jan. 11, 2019
 - 20-year veteran of Ohio EPA
 - Former Deputy Director of Business Relations and Chief of Office of Compliance Assistance & Pollution Prevention
- Expanding electronic submittals and reporting options
 - Section 401 Water Quality Certification for wetlands
- Continuing to implement federal requirements and review state environmental regulations
 - General acceptance of U.S. EPA guidance revisions
 - All Ohio environmental regulations subject to 5-year review



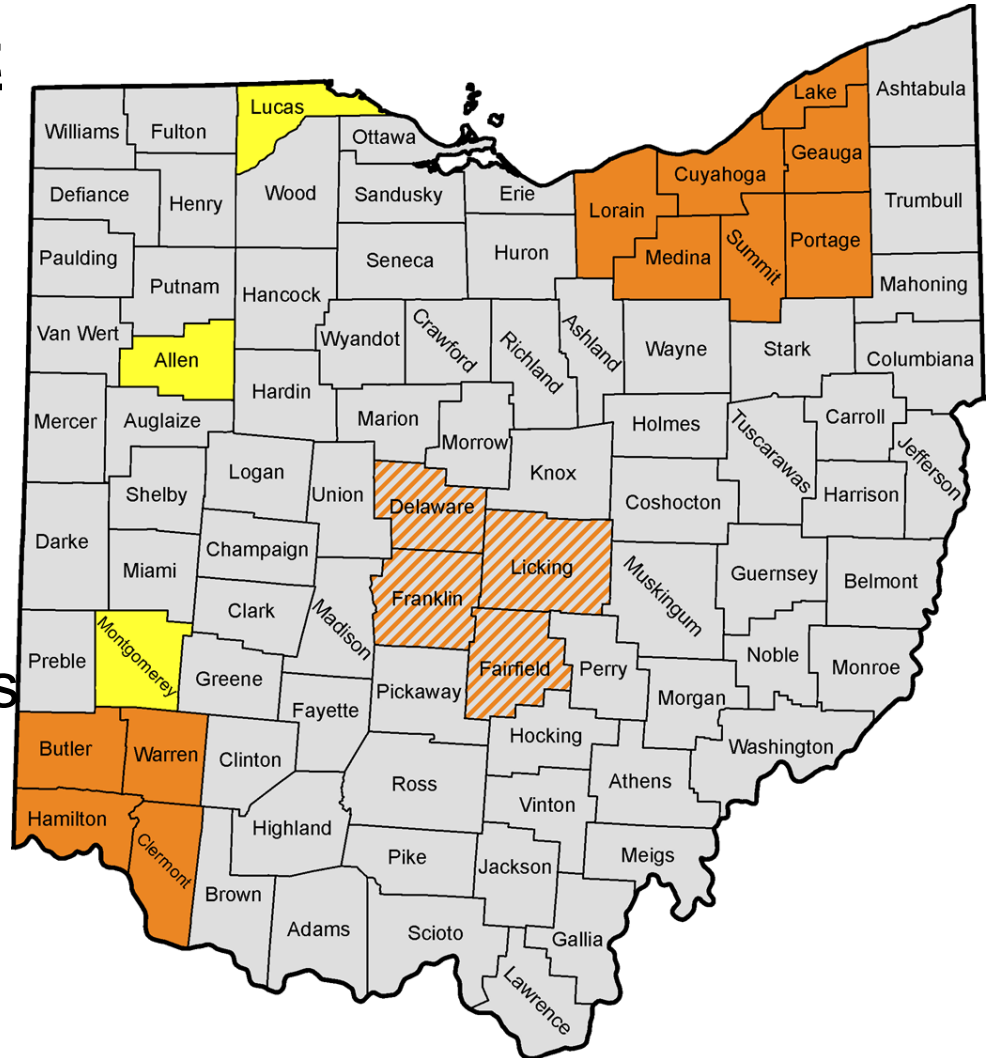
2015 Ozone Nonattainment

Current Non-attainment:

- Cincinnati metro area
- Columbus metro area
- Cleveland metro area

Areas of Interest:

- **Montgomery County:**
>0.070 ppm/2 avg periods
- **Allen County:**
>0.070 ppm/1 avg period
- **Lucas County:**
0.078 ppm/1 year



Ohio Updates

2015 Ozone Nonattainment Areas for Ohio

- Ohio is beginning process to redesignate Central Ohio as attainment for the 2015 Ozone Standard (0.070 ppm)
 - 2013-15 Average: 0.071 ppm
 - **2014-16 Average: 0.071 ppm (Data used for designation)**
 - 2015-17 Average: 0.071 ppm
 - 2016-18 Average: 0.069 ppm
- State Implementation Plans due for Cincinnati / Cleveland by Aug. 3, 2020
 - Additional regulations and controls for sources of volatile organic compounds and nitrogen oxides
 - **Expect more requirements for mobile and area sources**
 - Ohio Choice Plus (E-check) already in place in Cleveland

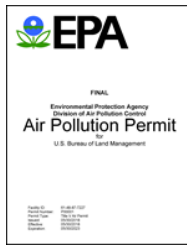
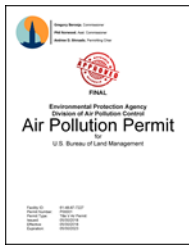
Permit Processing Time

Multiple reasons for increasing permit processing time

- Incomplete application or supplemental information
- Multiple agency review or approval
- Public comment periods

Develop a comprehensive permit strategy for delays

- Review permit comment periods for each agency and permit type (general vs. site-specific permits)
- Create alternatives and contingency plans for delays
- Engage agencies and the public
- Political involvement and legal action **INCREASE** permit processing time



Methane Control

Methane Control

Methane Control From Taking Compressors Offline:

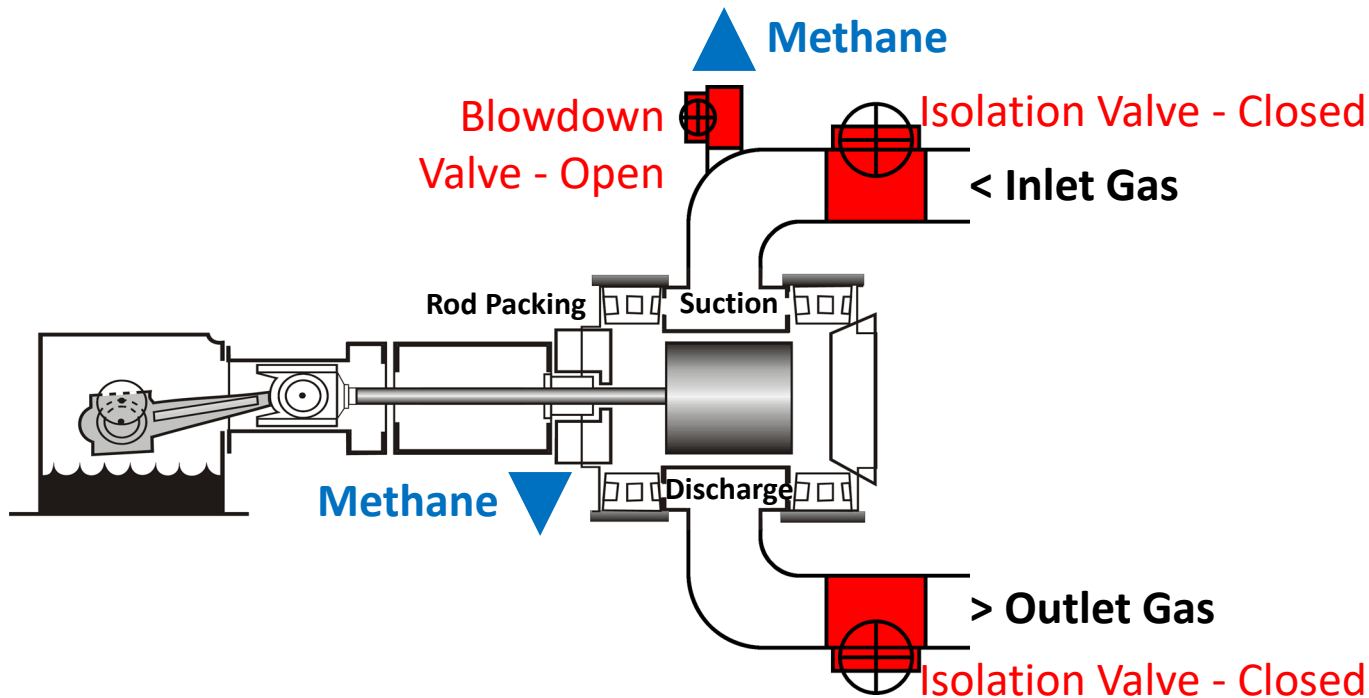
- Natural gas compressors are cycled online and offline as demand fluctuates and due to maintenance and repair
- Blowdown is standard practice for taking compressor offline
 - Close isolation valves to and from compressor
 - Closed valves leak ≈ 1.4 thousand cubic feet (MCF)/hour
 - Open blow down valves to depressurize compressor
 - Compressor blowdown vents ≈ 15 MCF/blowdown
- Alternative practices reduce methane emissions



Methane Control

Compressor Depressurized - Blowdown

- Discharge all natural gas from compressor to atmosphere
 - All blowdown natural gas lost (≈ 15 MCF/blowdown)
 - Ongoing natural gas loss (≈ 1.4 MCF/hour)



Methane Control

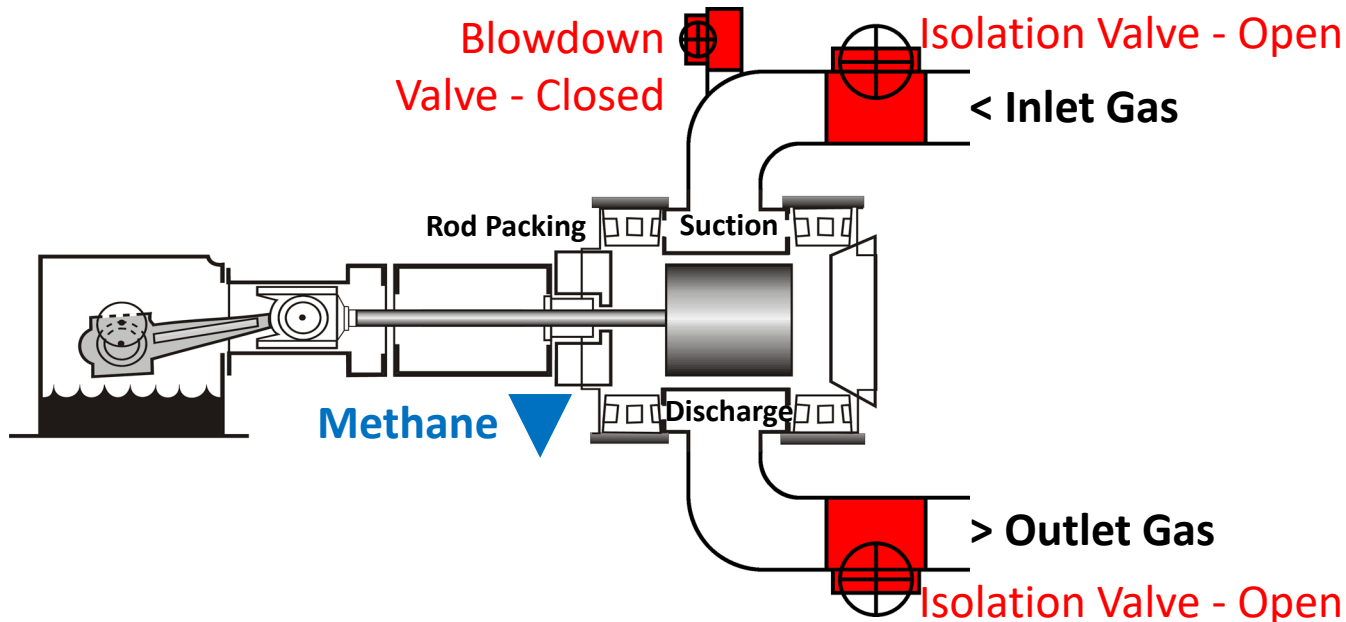
Methane Reduction Options from Offline Compressors:

1. Compressor Pressurized - Line Pressure
2. Compressor Pressurized - Low Pressure
3. Compressor De-/Pressurized - Static Seal
4. Compressor Depressurized - Flare
5. Compressor Depressurized - Ejector
6. Compressor Depressurized - ZEVAC

Methane Control

1. Compressor Pressurized - Line Pressure

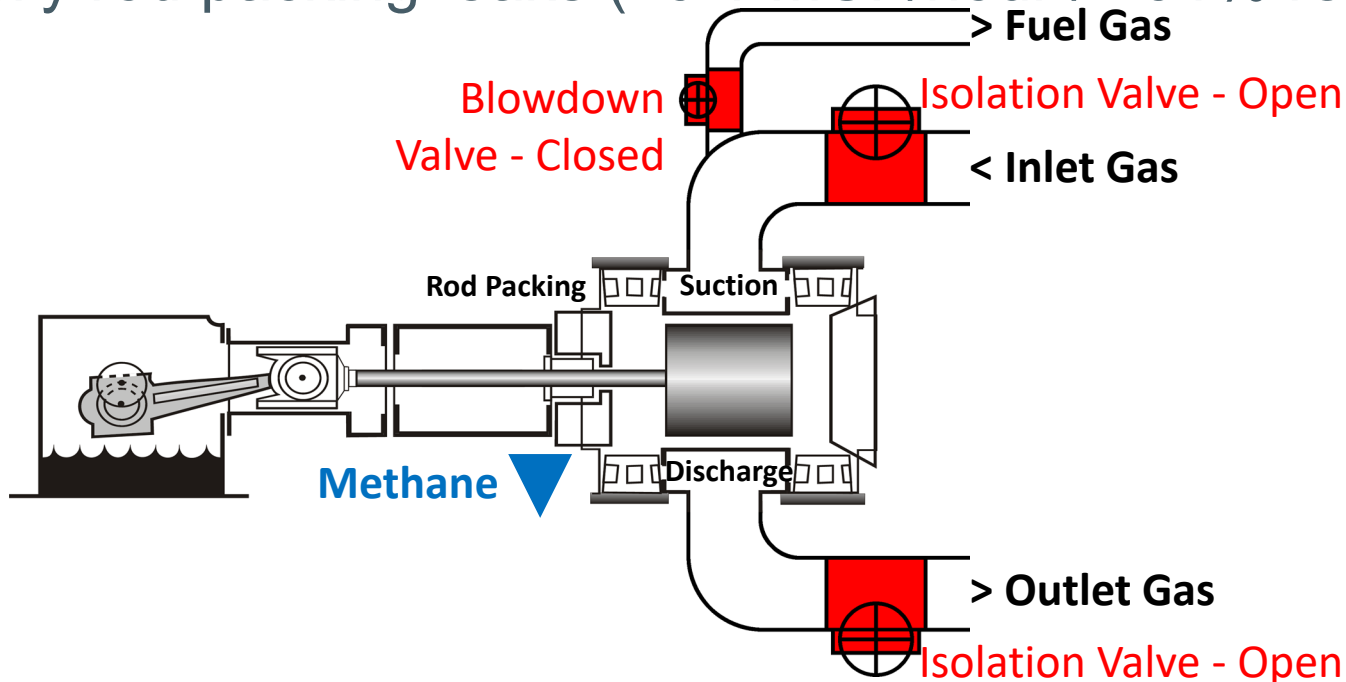
- No new equipment needed
- Keep compressor pressurized and isolated
 - No blowdown loss
 - Only rod packing leaks (≈ 0.3 MCF/hour / $\leq 68\%$ reduction)



Methane Control

2. Compressor Pressurized - Low Pressure

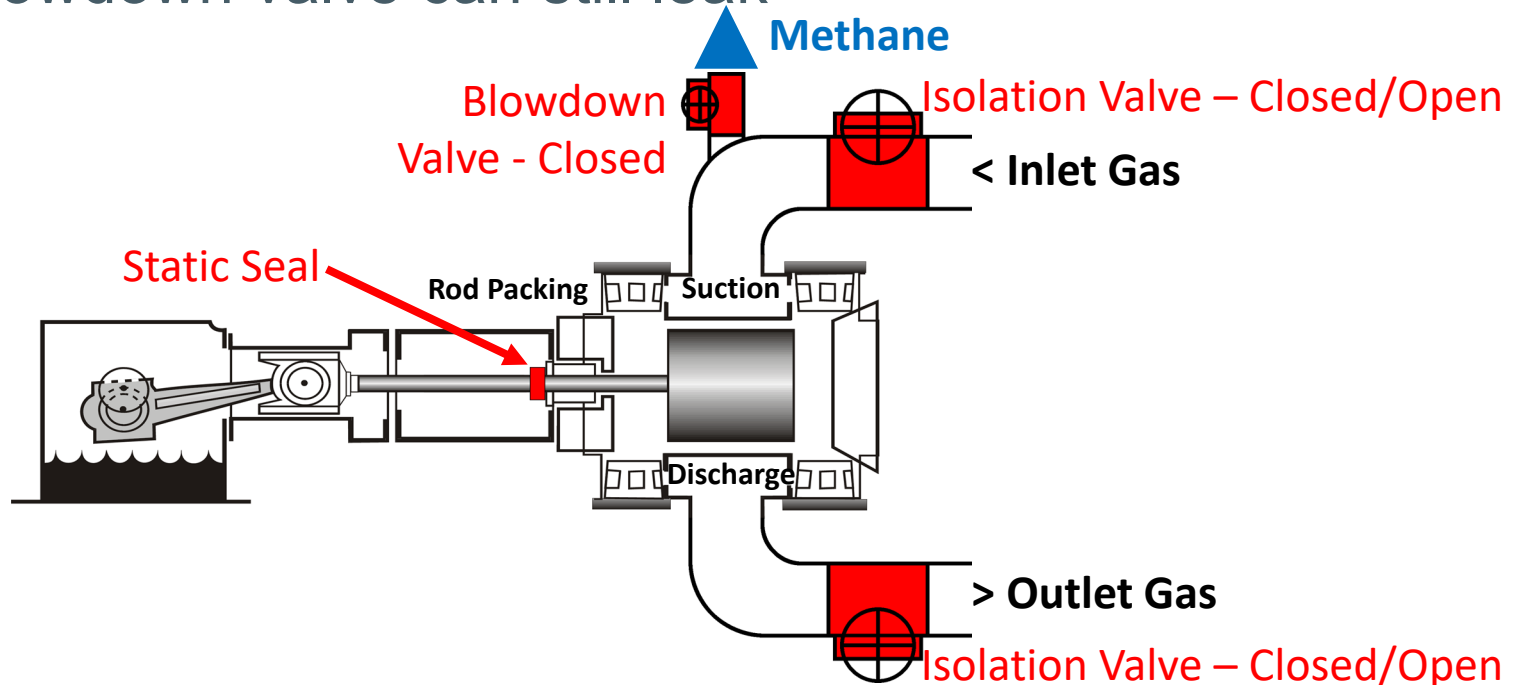
- Connect blowdown to fuel gas / low pressure system
- Compressor pressurized at lower pressure and isolated
 - No blowdown loss
 - Only rod packing leaks (≈ 0.1 MCF/hour / $\leq 91\%$ reduction)



Methane Control

3. Compressor De-/Pressurized – Static Seal

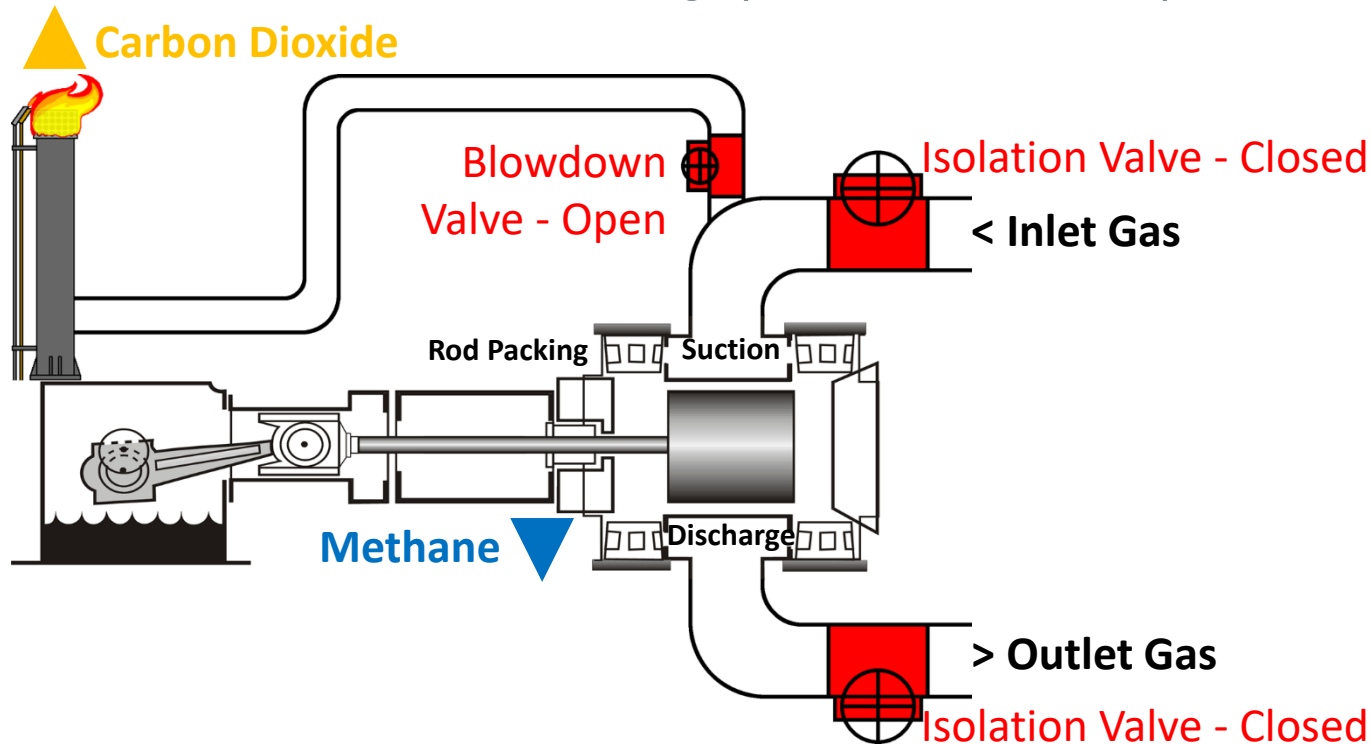
- Automatic controller seals rod packing when shutdown
- Compressor can be pressurized or depressurized
 - Only controls leaks from rod packing (100% reduction)
 - Blowdown valve can still leak



Methane Control

4. Compressor Depressurized - Flare

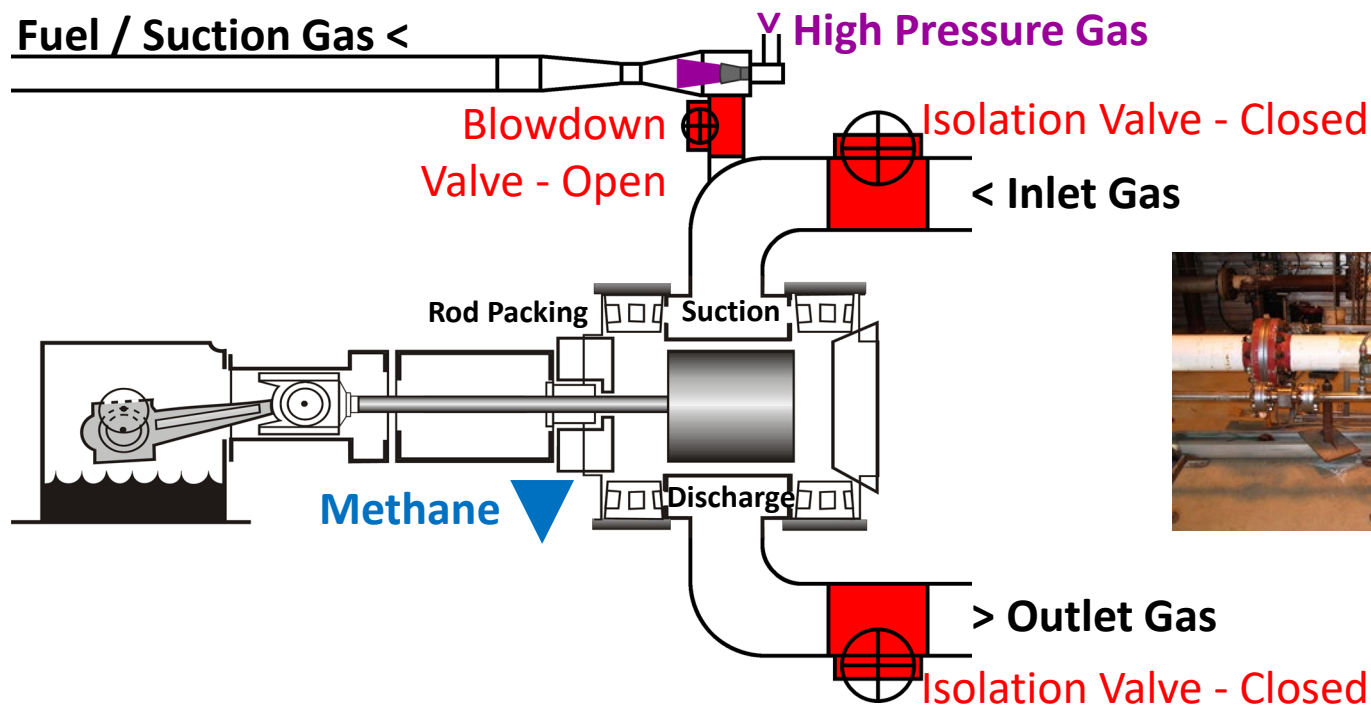
- Attach flare for blowdown
 - Blowdown converted to carbon dioxide (100% reduction)
 - Isolation valves still leaking (≈ 1.4 MCF/hour)



Methane Control

5. Compressor Depressurized - Ejector

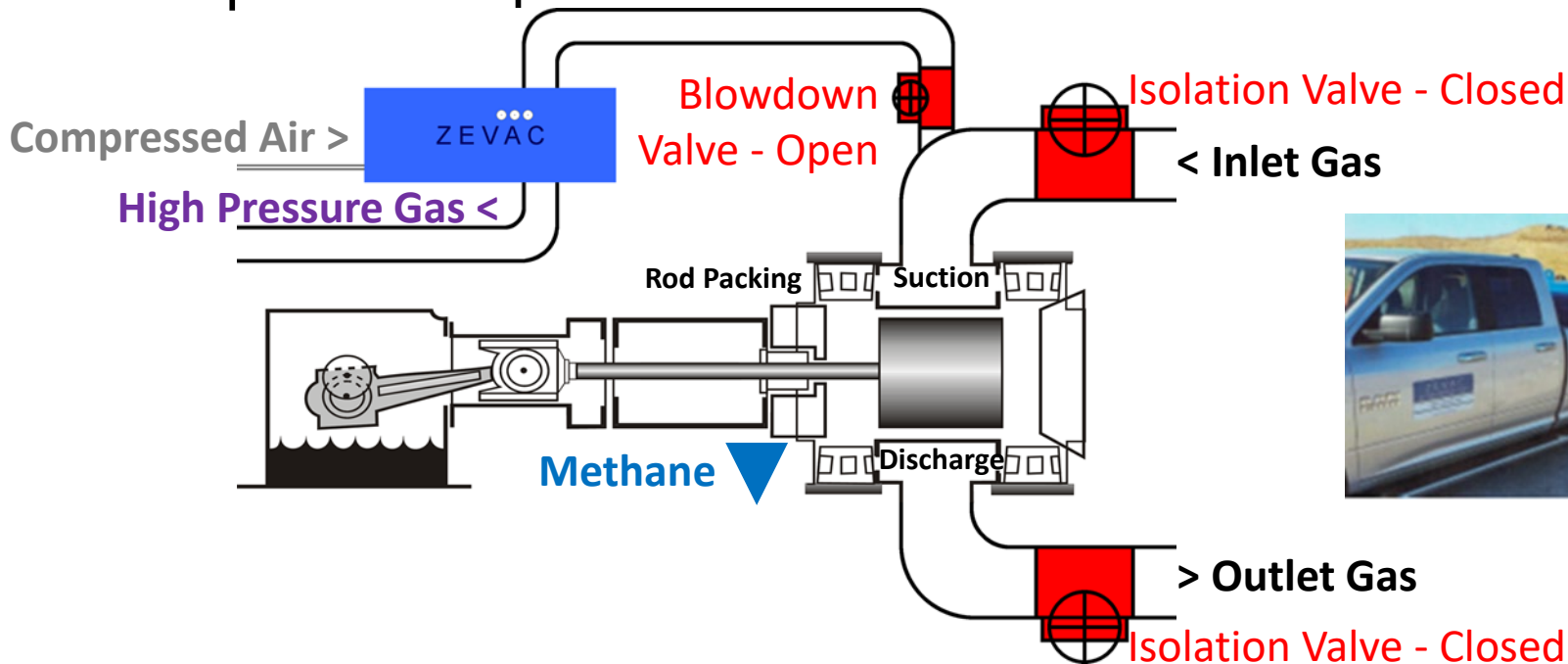
- Attach venturi nozzle to fuel / suction gas for blowdown
 - Blowdown captured ($\leq 100\%$ reduction)
 - Isolation valves still leaking (≈ 1.4 MCF/hour)



Methane Control

6. Compressor Depressurized - ZEVAC

- Connect ZEVAC unit to high pressure gas for blowdown
 - Blowdown captured ($\leq 100\%$ reduction)
 - Isolation valves still leaking (≈ 1.4 MCF/hour)
- Requires compressed air



Methane Control

Subpart OOOOa Applicability (*After Sep. 18, 2015*)

- OOOOa requires leak detection on **ALL** fugitive emissions components new, modified, & reconstructed compressors
 - **New**: Compressor(s) installed at empty site
 - **Modified**:
 - Additional compressor(s) installed at an existing site; or
 - Compressor(s) replaced with greater horsepower
 - Replacing compressors with equal or less horsepower is **NOT** a modification
 - **Reconstructed**: fixed capital costs of new components >50% of fixed capital costs for a comparable new facility
 - Request determination from EPA Region 5 60 days before construction