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## NSPS 0000 and 0000a Workshop

Columbus, OH ♦ August 22, 2018

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Georgette Reeves, Director  
Oil and Gas Sector Services

## Logistics

- > Phones
- > Restrooms
- > Emergency Exits
- > Lunch
- > Breaks



## Expectations for today's course

- > Engaging discussion
- > Lively debate
- > Clarification of potentially vague items based on historical interpretations

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## What not to expect from the course...

- > Absolute answers to everything!



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## Disclaimer

- > This course and instructor are not providing legal advice;
- > Air quality regulations are a dynamic field - things we cover today may change; and
- > The views expressed here do not represent the views of Trinity Consultants' clients.



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## (some of) The NSPS 0000a Team

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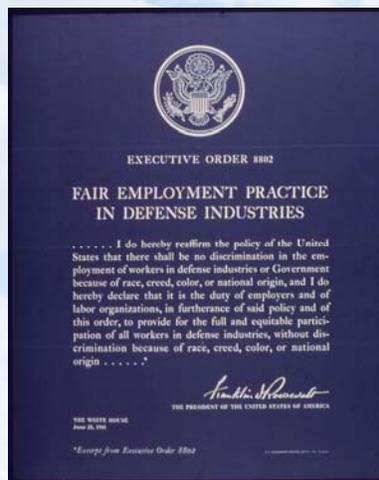
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## Agenda

- > Introductions and Opening Remarks
- > Section 1: Overview of NSPS
  - ❖ Key concepts: construction, modification and re-construction
- > Section 2: NSPS Subpart 0000 and 0000a
  - ❖ Overview and comparison
  - ❖ Requirements by source
  - ❖ 0000, 0000a and GHG Reporting - transparency is the “New Normal”
- > Section 3: Case Studies and Discussion
  - ❖ Prepared case studies
  - ❖ Think about specific cases to add...



## A Note on Executive Orders...



## Executive Orders

- > Executive Orders direct agencies to take action - they do not, in and of themselves, rescind, revise, replace, suspend or modify any existing regulations.
- > Any changes to existing regulations must undergo the full rulemaking process OR must already be stayed through judicial review.

9

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## Regulatory Rulemaking

- > Regulatory rulemaking takes time.
  - ❖ Boiler MACT has been in various stages for more than TEN years!
  - ❖ NSPS OOOO took a full year from proposed to final, which was breakneck speed for EPA.
  - ❖ Even OOOOa took 10 months- and that was an update to an existing regulation.
- > Regulatory rulemaking requires stakeholder input.
  - ❖ Generally speaking, public comment is not supportive of rolling back regulations

10

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## NSPS 0000a: 90-day Stay

- > A 90-day stay for limited provisions of the rule (August 31, 2017 compliance deadline)
  - ❖ Pneumatic pump requirements (not at gas processing plants)
  - ❖ Closed vent system (CVS) design certification
  - ❖ Leak detection and repair (LDAR) surveys
- > Vacated by D.C. Circuit Court on July 3
  - ❖ Court required “immediate enforcement”

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## NSPS 0000a: 2-year Stay

- > June 3, 2017: EPA proposes a rulemaking to delay the following:
  - ❖ LDAR requirements for well sites and compressor stations
  - ❖ P.E. Certification for Closed Vent Systems (CVS)
  - ❖ Pneumatic pump requirements
  - ❖ Comment period closes August 9, 2017
- > D.C. Court decision does not impact EPA’s authority to implement a 2-year stay, however...

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## NSPS 0000a: 2-year Stay

“We emphasize, however, that nothing in this opinion in any way limits EPA’s authority to reconsider the final rule and to proceed with its June 16 NPRM. Although EPA had no section 307(d)(7)(B) *obligation* to reconsider the methane rule, it is free to do so as long as “the new policy is permissible under the statute . . . , there are good reasons for it, and . . . the agency *believes* it to be better.” *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009).”

[https://www.cadc.uscourts.gov/internet/opinions.nsf/a86b20d79beb893e85258152005ca1b2/\\$file/17-1145-1682465.pdf](https://www.cadc.uscourts.gov/internet/opinions.nsf/a86b20d79beb893e85258152005ca1b2/$file/17-1145-1682465.pdf)



## NSPS 0000a: Notice of Data Availability

- > Two issued on 11/1/2017:
  - ❖ 90-day Stay
  - ❖ 2-year Stay
- > Seeking information on two main points:
  - ❖ Challenges of implementation; and
  - ❖ EPA’s legal authority to issue a stay.
- > Comment period closed 12/8/2017
  - ❖ No substantive comments as of 11/27, fairly anemic response



**Moving on!**

An illustration showing several stylized human figures running on a series of parallel arrows that point to the right. The arrows are colored in shades of blue and yellow. The background is a light blue sky with white clouds and a pattern of light blue squares in the upper right corner.

15

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**Section 1**  
**Overview of NSPS**

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## New Source Performance Standards (NSPS)

### New Source Performance Standards

Criteria Pollutants (e.g., VOC, NO<sub>x</sub>, CO, PM, SO<sub>2</sub>)

OOOOa adds GHG (as does Subpart TTTT)

Affected facilities at all types of sites

Only regulates New, Modified, or Reconstructed Sources

Proposal date is effective date.

**Note: the definition of “new,” “modified” and “reconstructed are critical when determining NSPS applicability!**



## National Emission Standards for Hazardous Air Pollutants

### National Emission Standards for Hazardous Air Pollutants (NESHAP) – NOT NSPS

Hazardous Air Pollutants (e.g., Formaldehyde, Benzene, Toluene, etc.)

Affected facilities at “major” or “area” [e.g., minor] sources

Regulates both new and existing sources

Proposal date is effective date.

**Note: More stringent requirements for new sources than existing sources, and more stringent requirements for major sources than area sources.**

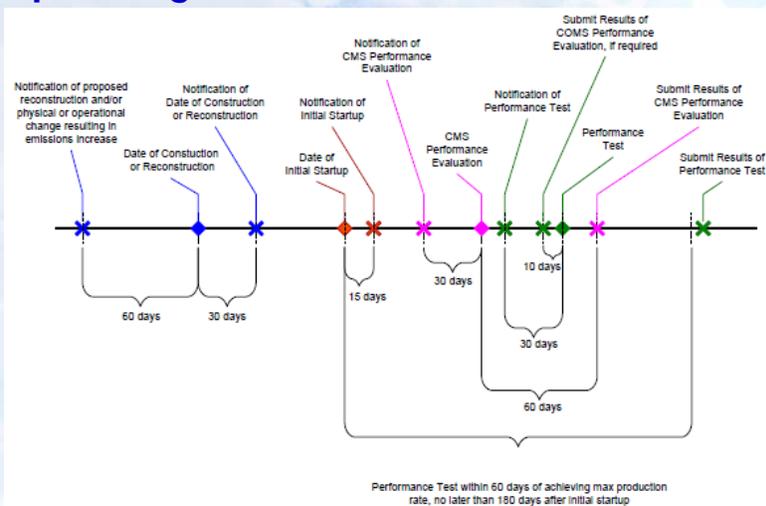


## General NSPS Requirements

- > Applies only to “new, modified or reconstructed sources”. Not existing.
  - ❖ These definitions and concepts are tricky
- > Requirements typically consist of:
  - ❖ Emission limitations
  - ❖ Performance testing (e.g., stack testing)
  - ❖ Parametric and/or emissions monitoring
  - ❖ Recordkeeping
  - ❖ Notifications
  - ❖ Reporting
- > The rules typically apply to the owner/operator
- > Engine manufacturers have requirements



## NSPS Subpart A - Notification and Reporting Timeline - Handout



## Application of “Subpart A”

- > Construction, modification and re-construction are defined within Subpart A
- > These definitions remain in place throughout all subsequent subparts unless specifically defined in a specific subpart
- > This concept is key when evaluating applicability under NSPS 0000a



## Construction/Affected Facility Definitions

- > Construction - fabrication, erection, or installation of an affected “facility”
- > Affected facility - with reference to a stationary source, any apparatus to which a standard is applicable
  - ❖ e.g., an engine vs. a compressor
  - ❖ e.g., a storage tank vs. gas well completion
- > Relocating an affected facility is not construction, modification, or reconstruction under NSPS and does not trigger the rule
  - ❖ Permitting may be required at the new site



## Modification Definition

- > Any physical or operational change to an existing *facility* (e.g., the engine) which results in an increase in the emission rate of any pollutant to which a standard applies (40 CFR 60.14)
- > Definitions and concepts of “modification” in other subparts can be different if defined within another subpart

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## Modification Details

- “increases the amount of any air pollutant”
- > HOURLY emissions rate change (40 CFR §60.14(b))
  - > Interpreted as increase in short-term potential emissions
  - > Increasing hours of operation alone without an increase in hourly emissions rate does not constitute a modification (40 CFR §60.14(e)(3))

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## Modification Details

### “to which a standard applies”

- > An increase in emissions of a pollutant *not* regulated by the NSPS Subpart is *not* a modification
- > Applicability is *pollutant-specific*: The only applicable sections of an NSPS Subpart are those which regulate the pollutant whose emissions increased due to the modification. (40 CFR 60.14(a))

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## NSPS Modification Exemptions

- > Routine maintenance, repair and replacement
- > An increase in production rate without a capital expenditure
  - ❖ Examples - tanks, engines, compressors
- > An increase in hours of operation
- > Use of an alternative fuel or raw material if source could accommodate it prior to the standard
- > Addition of air pollution control device
- > Change in ownership

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## Capital Expenditure per Subpart A

- > Capital expenditure means an expenditure for a physical or operational change to an existing facility which exceeds the **product of the applicable “annual asset guideline repair allowance percentage”** specified in the latest edition of Internal Revenue Service (IRS) Publication 534 **and the existing facility's basis**, as defined by section 1012 of the Internal Revenue Code. However, the total expenditure for a physical or operational change to an existing facility must not be reduced by any “excluded additions” as defined in IRS Publication 534, as would be done for tax purposes.

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## NSPS VVa Applicability through NSPS 0000

- > NSPS Subpart 0000 gas processing plant fugitives are addressed through Subpart VVa
- > **Addition or replacement of equipment for the purpose of *process improvement* which is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart**
- > Process improvement means routine changes
  - ❖ Safety and occupational health requirements,
  - ❖ Energy savings,
  - ❖ Ease of maintenance and operation,
  - ❖ Correction of design deficiencies,
  - ❖ Bottleneck removal,
  - ❖ Changing product requirements, or
  - ❖ Environmental control

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## Reconstruction Definition

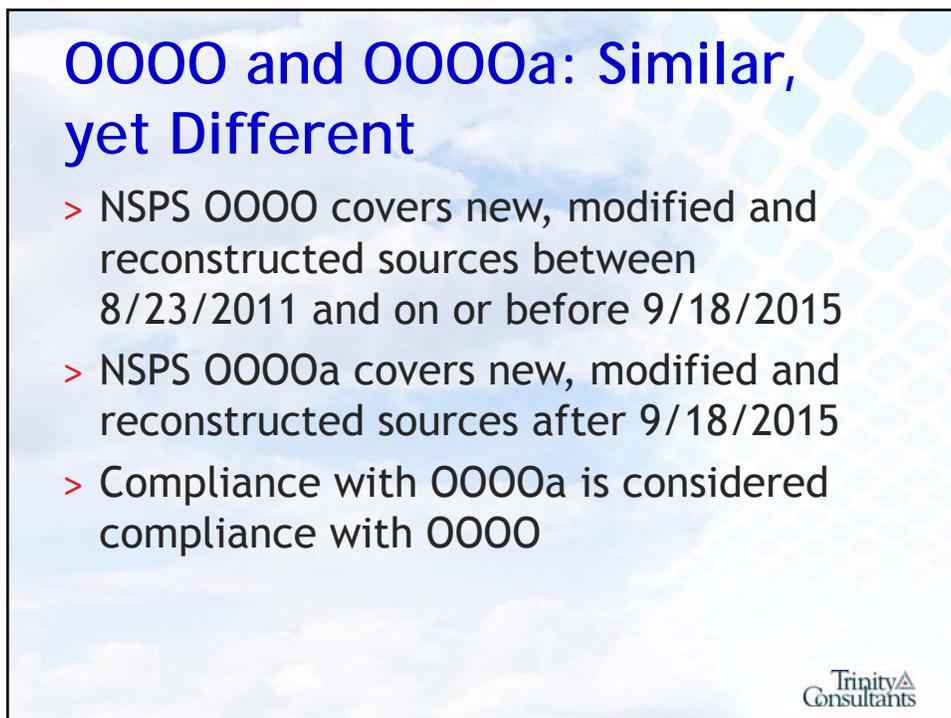
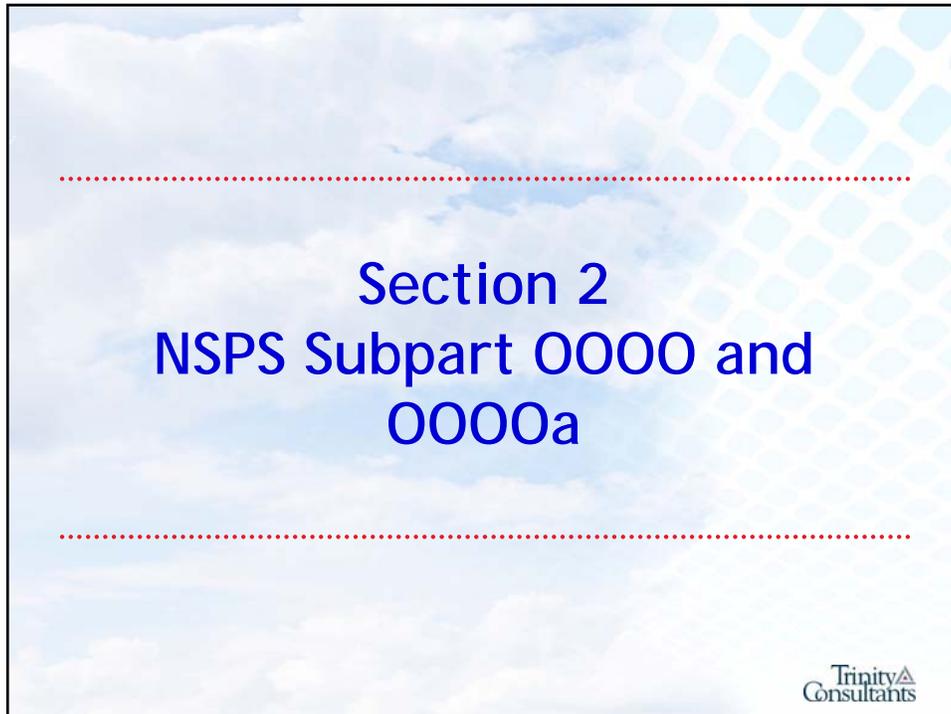
- > The replacement of components of an existing facility...
  - ❖ ...to such an extent that the fixed capital cost of the new components exceeds **50% of the fixed capital cost that would be required to construct a comparable entirely new facility**,
    - ◆ “Fixed capital costs” = capital needed to provide all the depreciable components
  - ❖ ...and it is technologically and economically feasible to meet applicable standards
- > **Effects on emissions are not considered**

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## Timing/Aggregation Issues

- > Do a series of projects at a given unit need to be aggregated together for reconstruction cost calculations?
  - ❖ Over what period?
- > General guidance: under the current wording of Section 60.15, costs for non-routine renovations must be aggregated stemming from what may be viewed objectively as **a single planning decision**
- > Some subparts (e.g., NSPS Subparts J and Ja) specify a specific period over which projects are to be aggregated
- > Continue to review EPA guidance on this issue as specific projects arise
  - ❖ Some EPA guidance is contradictory on this issue

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## 0000 and 0000a - How They Work Together

August 23, 2011 - September 18, 2015  
0000

September 19, 2015 →  
0000a

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## Subpart 0000 Affected Facilities

- > *0000 is a VOC rule...not a GHG rule*
- > Each natural gas well that is hydraulically fractured
- > Each centrifugal compressor using wet seals
- > Each reciprocating compressor
- > Each continuous bleed natural-gas driven pneumatic controller
- > Each storage vessel with a  $\geq 6$  tpy VOC PTE
- > Group of equipment (pump, pressure relief device, open-ended valve or line, valve, and flange or other connector in VOC or wet gas service), within a process unit located at onshore natural gas processing plants
- > Sweetening units located at onshore natural gas processing plants

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## Affected Facility Exceptions

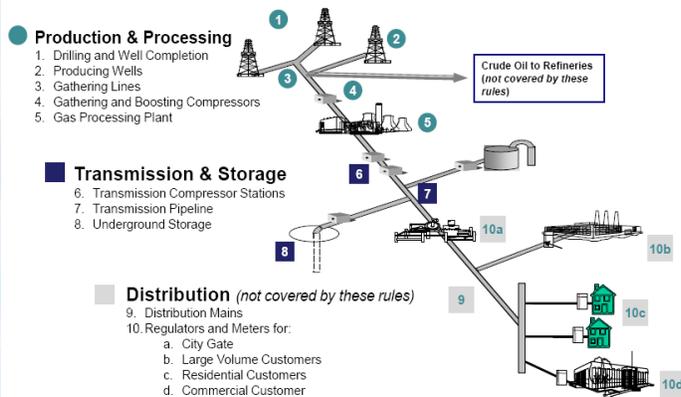
- > Pneumatic controllers with a natural gas bleed rate  $\leq 6$  scfh not at gas processing plants are not affected
- > Intermittent pneumatic controllers are not affected
- > Centrifugal compressors using dry seals are not affected
- > Centrifugal and reciprocating compressors located at a well site are not affected
  - ❖ Well site means one or more areas that are directly disturbed during the drilling and subsequent operation of, or affected by, production facilities directly associated with any oil well, gas well, or injection well and its associated well pad.



## Oil and Gas per EPA (under 0000)

### Oil and Natural Gas Operations

Oil and natural gas systems encompass wells, gas gathering and processing facilities, storage, as well as transmission and distribution pipelines. These components are all important aspects of the process of getting natural gas out of the ground and to the end user.



Source: Adapted from American Gas Association and EPA Natural Gas STAR Program

36

3



## Subpart OOOO Applicability

NSPS OOOO Affected Facility	Production (Well Site)	Gathering	Gas Processing	Transmission
Gas Well	X			
Centrifugal Compressors		X	X	
Reciprocating Compressors		X	X	
Pneumatic Controller	X	X	X	
Storage Vessels	X	X	X	X
Equipment Leaks			X	
Sweetening Units			X	

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## OOOO Compliance Schedule

NSPS OOOO Affected Facility	Standard	Compliance Date
Hydraulically fractured wildcat and delineation wells	Completion combustion	October 15, 2012
Hydraulically fractured low pressure non-wildcat and non-delineation wells	Completion combustion	October 15, 2012
Other hydraulically fractured wells	Completion combustion	Before 1/1/2015
Other hydraulically fractured wells	REC and completion combustion	After 1/1/2015
Centrifugal compressors with wet seals	95% reduction	October 15, 2012
Reciprocating compressors	Change rod packing	October 15, 2012
Pneumatic controllers at NG processing plants	Zero bleed rate	October 15, 2012
Pneumatic controllers between wellhead and NG processing plants	6 scfh bleed rate	October 15, 2013
Group 2 and 1 Storage Vessels	95% reduction	April 15, 2014/2015
Equipment Leaks	LDAR program	October 15, 2012
Sweetening Units	Reduce SO <sub>2</sub> as calculated	October 15, 2012

## NSPS 0000a - What is the purpose of this subpart?

This subpart establishes emission standards and compliance schedules for the control of [GHG], volatile organic compounds (VOC) and sulfur dioxide (SO<sub>2</sub>) emissions from affected facilities in the crude oil and natural gas source category that commence construction, modification or reconstruction after September 18, 2015.

## Definition of the Source Category [60.5430a]

Crude oil and natural gas source category means:

1. Crude oil production, which includes the well and extends to the point of custody transfer to the crude oil transmission pipeline or any other forms of transportation; and
2. Natural gas production, processing, transmission, and storage, which include the well and extend to, but do not include, the local distribution company custody station.

## Definition of Custody Transfer [60.5430a]

Custody transfer means the transfer of crude oil or natural gas after processing and/or treatment in the producing operations, or from storage vessels or automatic transfer facilities or other such equipment, including product loading racks, to pipelines or any other forms of transportation.

41

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NSPS 0000a Affected Facility	Production (Well Site)	Gathering	Gas Processing	Transmission & Storage
Hydraulically Fractured Wells	X			
Centrifugal Compressors		X	X	X
Reciprocating Compressors		X	X	X
Pneumatic Controller	X	X	X	X
Pneumatic Pumps	X		X	
Storage Vessels	X	X	X	X
Equipment Leaks	X	X	X	X
Sweetening Units			X	

NSPS OOOOa Affected Facility	Standard	Compliance Date
Hydraulically fractured wildcat wells, delineation wells, or low pressure wells	Completion combustion	August 2, 2016
Other hydraulically fractured wells	REC, completion combustion unless GOR < 300 scf/bbl	August 2, 2016 November 30, 2016 for REC standard for non-gas wells
Centrifugal compressors with wet seals (not on well sites, up to the LDC)	95% reduction (P.E. Certification if equipped with CVS)	August 2, 2016
Reciprocating compressors (not on well sites, up to the LDC)	Change rod packing or route emissions to process (P.E. Certification if equipped with CVS)	August 2, 2016
Pneumatic controllers at NG processing plants	Zero bleed rate	August 2, 2016
Continuous bleed pneumatic controllers between wellhead and the LDC (not at gas processing plants)	≤6 scfh bleed rate	August 2, 2016

NSPS OOOOa Affected Facility	Standard	Compliance Date
Pneumatic pumps at gas processing plants	Zero bleed rate	November 30, 2016
Pneumatic pumps at well sites	95% reduction if control or process available onsite (P.E. Certification if equipped with CVS)	November 30, 2016
Storage vessels	95% reduction (P.E. Certification if equipped with CVS)	August 2, 2016
Equipment leaks at gas processing plants	Leak Detection and Repair (LDAR) program	August 2, 2016
Equipment leaks at well sites and compressor stations	LDAR program	June 3, 2017
Sweetening units at gas processing plants	Reduce SO <sub>2</sub> as calculated	August 2, 2016



## Standards for Hydraulically Fractured Wellheads [60.5375a]

Hydraulically Fractured Well Operation	Control Option 1 REC	Control Option 2 Combust	Control Option 3 General Duty
Wildcat and delineation wells		X	X
<u>Low pressure</u> non-wildcat and non-delineation		X	X
All other wells with a <u>GOR</u> $\geq 300$ scf/bbl	X	X (if REC is infeasible)	X
Wells with a <u>GOR</u> $< 300$ scf/bbl	Recordkeeping and Reporting Requirements Only		

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## Low Pressure Wells

- > Calculation methods to determine if well is “low pressure” are in 60.5432a
- > *Low pressure well* means a well that satisfies at least one of the following conditions:
  - ❖ (1) The static pressure at the wellhead following fracturing but prior to the onset of flowback is less than the flow line pressure at the sales meter;
  - ❖ (2) The pressure of flowback fluid immediately before it enters the flow line, as determined under § 60.5432a, is less than the flow line pressure at the sales meter; or
  - ❖ (3) Flowback of the fracture fluids will not occur without the use of artificial lift equipment.

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## GOR: Definition [60.5430a]

- > Gas to Oil Ratio (GOR) means the ratio of the volume of gas at standard temperature and pressure that is produced from a volume of oil when depressurized to standard temperature and pressure.

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## Wellhead Requirements - 3 in all [60.5375a]

1. **REC** - Perform reduced emissions completions/green completions:
  - > During the **initial flowback** stage, route the **flowback** into one or more well completion vessels or storage vessels and commence operation of a separator unless it is technically infeasible for a separator to function. Any gas present in the initial flowback stage is not subject to control under this section.
  - > During the **separation flowback** stage, route all **recovered liquids** from the separator to one or more well completion vessels or storage vessels, re-inject the liquids into the well or another well or route the recovered liquids to a collection system. Route the **recovered gas** from the separator into a gas flow line or collection system, re-inject the recovered gas into the well or another well, use the recovered gas as an on-site fuel source, or use the recovered gas for another useful purpose that a purchased fuel or raw material would serve. If it is infeasible to route the recovered gas as required above, route gas to combustion device. If, at any time during the separation flowback stage, it is not technically feasible for a separator to function, you must comply with requirements for initial flowback.
  - > A separator must be on-site for entirety of flowback period [NSPS 0000a only]

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## Separator Exceptions [60.5375a]

- > Separator exceptions not required to be on-site if:
  - ❖ Well is not hydraulically fractured or refractured with liquids; or
  - ❖ Well does not generate condensate, intermediate hydrocarbon liquids, or produced water.
- > If liquid collection starts, operator must stop the well completion operation and install a separator.

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## Wellhead Requirements - 3 in all

2. Completions Combustion - Capture and direct **recovered gas** that cannot be directed to the flow line to a **completion combustion device** (unless risk of fire or explosion). It must be equipped with a reliable continuous ignition source.

3. General Duty - Maximize resource recovery and minimize releases to the atmosphere during flowback and subsequent recovery.

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## Flowback - Definitions

Flowback means the process of allowing fluids and entrained solids to flow from a well following a treatment, either in preparation for a subsequent phase of treatment or in preparation for cleanup and returning the well to production.

The term flowback also means the fluids and entrained solids that emerge from a natural gas well during the flowback process.

The flowback period begins when material introduced into the well during the treatment returns to the surface following hydraulic fracturing or refracturing. The flowback period ends when either the well is shut in and permanently disconnected from the flowback equipment or at the startup of production. The flowback period includes the **initial flowback** stage and the **separation flowback** stage.

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## Flowback Stages - Definitions

- > Initial flowback stage means the period during a well completion operation which begins at the onset of flowback and ends at the separation flowback stage.
- > Separation flowback stage means the period during a well completion operation when it is technically feasible for a separator to function. The separation flowback stage ends either at the startup of production, or when the well is shut in and permanently disconnected from the flowback equipment.

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## Reduced Emission Completions (REC) - Definitions

- > *Reduced emissions completion* means a well completion following fracturing or refracturing where gas flowback that is otherwise vented is captured, cleaned, and routed to the gas flow line or collection system, re-injected into the well or another well, used as an onsite fuel source, or used for other useful purpose that a purchased fuel or raw material would serve, with no direct release to the atmosphere.

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## Recovered Gas/Liquids - Definitions

- > Recovered gas means gas recovered through the separation process during flowback.
- > Recovered liquids means any crude oil, condensate or produced water recovered through the separation process during flowback.

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## Well Completion "To-Do" [60.5420a]

- > Submit advance notification to the Administrator at least 2 days prior to the commencement of completion of an affected well.
  - ❖ Anticipated date of well completion
  - ❖ Contact information for owner/operator
  - ❖ U.S. well number
  - ❖ Latitude and longitude
  - ❖ Planned date of the beginning of flowback
- > States that already require advance notifications satisfy this requirement

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## Well Completion “To-Do” [60.5420a]

- > During completion, keep a daily log book with:
  - ❖ Location
  - ❖ API Well Number
  - ❖ Date and Time of Flowback
  - ❖ Date(s) and Time(s) to Attempt Separation
  - ❖ Date and Time of Startup of Production
  - ❖ Duration of Venting and Justification (or Deviation)
  - ❖ Duration and Method of Recovery
  - ❖ Duration of Combustion
  - ❖ Deviations and Justification

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## Well Completion “To-Do”

- > In lieu of previous records, for wellheads subject to both REC and completion combustion equipment, a digital photograph can be taken that contains:
  - ❖ Date of photograph
  - ❖ Longitude and latitude of the well site embedded within or stored with the photograph (or separate GIS device visible in frame)
  - ❖ Picture of equipment for storing or re-injecting recovered liquid, equipment for routing recovered gas to gas flow line, and the completion combustion device connected to and operating at each completion operation

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## So... you plan to hydraulically fracture a well?

**B**efore starting your project, notify environmental personnel at least 72 hours prior to completion and include the following:

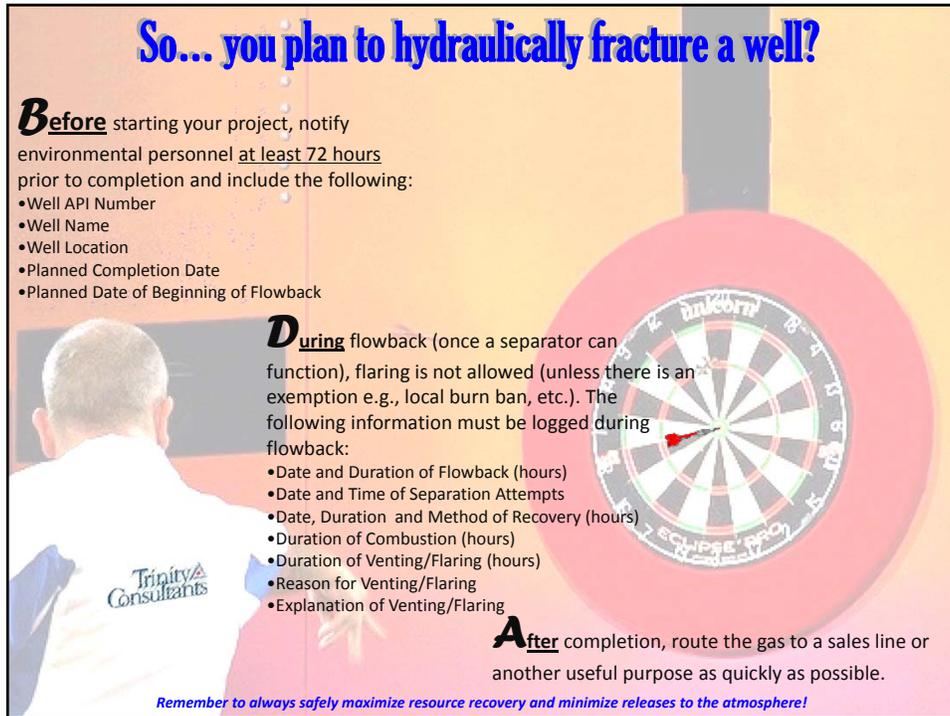
- Well API Number
- Well Name
- Well Location
- Planned Completion Date
- Planned Date of Beginning of Flowback

**D**uring flowback (once a separator can function), flaring is not allowed (unless there is an exemption e.g., local burn ban, etc.). The following information must be logged during flowback:

- Date and Duration of Flowback (hours)
- Date and Time of Separation Attempts
- Date, Duration and Method of Recovery (hours)
- Duration of Combustion (hours)
- Duration of Venting/Flaring (hours)
- Reason for Venting/Flaring
- Explanation of Venting/Flaring

**A**fter completion, route the gas to a sales line or another useful purpose as quickly as possible.

*Remember to always safely maximize resource recovery and minimize releases to the atmosphere!*



# Compressor Requirements





## Standards for Centrifugal Compressors

- > Centrifugal compressors equipped with wet seals (not at a well site facility) constructed, modified or reconstructed >8/23/2011 but before 9/18/2015:
  - ❖ Reduce VOC emissions from each wet seal fluid degassing system by  $\geq 95.0$  percent
  - ❖ If using a control device, equip with specified cover and connect through a closed vent system to a control device
  - ❖ Conduct initial inspection
  - ❖ Install and operate continuous parameter monitoring system (CPMS)
  - ❖ Initial performance test required

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## Standards for Centrifugal Compressors

- > Centrifugal compressors equipped with wet seals (not at a well site facility) constructed, modified or reconstructed >9/18/2015:
  - ❖ Reduce VOC emissions from each wet seal fluid degassing system by  $\geq 95.0$  percent
  - ❖ Equip with P.E. certified closed vent system to a control device
  - ❖ Conduct initial inspection
  - ❖ Install and operate continuous parameter monitoring system (CPMS)
  - ❖ Initial performance test required

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## Standards for Reciprocating Compressors

- > Applies to reciprocating compressors not located at a well site constructed, modified, reconstructed >8/23/2011
- > Primary requirement is to replace the rod packing or otherwise collect vapors
- > You can choose to replace rod packing before either of the following occur:
  - ❖ the compressor has operated for 26,000 hours; or
  - ❖ 36 months from the last replacement.

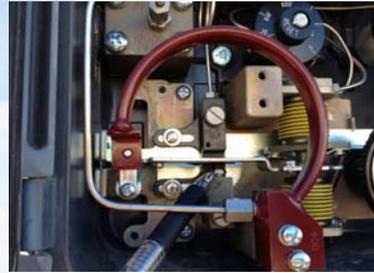


## Natural Gas Driven Pneumatic Controller Requirements



## Definitions

- > Natural Gas-Driven Pneumatic Controller
  - ❖ 0000: An automated instrument powered by pressurized natural gas and used for maintaining a process condition such as liquid level, pressure, delta-pressure and temperature.
  - ❖ 0000a (added): A pneumatic controller powered by pressurized natural gas



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## Definitions

- > Bleed Rate
  - ❖ 0000 and 0000a: The rate in standard cubic feet per hour at which natural gas is continuously vented (bleeds) from a pneumatic controller.

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## Definitions

- > Continuous Bleed
  - ❖ 0000: A continuous flow of pneumatic supply natural gas to the process control device (e.g., level control, temperature control, pressure control) where the supply gas pressure is modulated by the process condition, and then flows to the valve controller where the signal is compared with the process set-point to adjust gas pressure in the valve actuator.
  - ❖ 0000a: A continuous flow of pneumatic supply natural gas to a pneumatic controller.
- > Intermittent / Snap-action Pneumatic Controller
  - ❖ 0000: Means a pneumatic controller that vents non-continuously.
  - ❖ 0000a: Means a pneumatic controller that is designed to vent non-continuously.

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## Standards for Pneumatic Controllers [60.5390a]

- > Each affected continuous bleed pneumatic controller at natural gas processing plants must have a bleed rate of zero
  - ❖ Applies to those pneumatic controllers that are new, modified, or reconstructed after August 23, 2011
  - ❖ Effective October 15, 2012

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## Standards for Pneumatic Controllers [60.5390a]

- > 0000: Each affected continuous bleed pneumatic controller between the wellhead and the natural gas transmission segment (*excluding natural gas processing plants*) must have a bleed rate of  $\leq 6$  scfh
  - ❖ Anything modified, constructed or reconstructed on or after October 15, 2013 *between the wellhead and a natural gas processing plant*
- > 0000a: Each pneumatic controller located between the well site and up to (but not including) the point of custody transfer to the Local Distribution Company (*excluding natural gas processing plants*) must have a bleed rate of  $\leq 6$  scfh



## Standards for Pneumatic Controllers [60.5390a]

- > Each pneumatic controller not meeting the standard must be tagged with the month and year of installation and identification information
- > Pneumatic controllers required to have a greater bleed rate due to “functional needs” (positive actuation, safety, and response time) are exempt from the  $< 6$  scfh limitation
  - ❖ These must be identified in the annual report, tagged, and justified



## Storage Vessel Requirements

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### Storage Tanks Subject to 0000 and 0000a

- > NSPS 0000 applies to individual tanks that emit  $\geq 6$  tpy VOC PTE that:
  - ❖ were constructed, modified, or reconstructed after August 23, 2011;
  - ❖ are located in the:
    - ◆ oil and natural gas production segment
    - ◆ natural gas processing segment
    - ◆ natural gas transmission and storage segment
  - ❖ Contain crude oil, condensate, produced water or intermediate hydrocarbon liquids
- > (Generally) install controls within 60 days of commencing operation.

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## Storage Vessels - Affected Facilities [60.5365a(e)]

- > A storage vessel with the potential to emit 6 tpy VOC or more based on the maximum average daily throughput determined for a 30-day period of production prior to the applicable emission determination deadline specified in this section.
  - ❖ Take into account legally and practically enforceable limits in a permit or other requirement.
  - ❖ Take credit for vapor recovery as long as the cover and closed vent system requirements are followed.
- > A storage vessel >100,000 gallons (2,380 bbl) used to recycle water that has been passed through two stage separation is not a storage vessel affected facility.

73

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## Storage Vessel Definition - NSPS 0000 and 0000a

*Storage vessel* means a tank or other vessel that contains an accumulation of crude oil, condensate, intermediate hydrocarbon liquids, or produced water, and that is constructed primarily of nonearthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provide structural support. A well completion vessel that receives recovered liquids from a well after startup of production following flowback for a period which exceeds 60 days is considered a storage vessel under this subpart. A tank or other vessel shall not be considered a storage vessel if it has been removed from service in accordance with the requirements of § 60.5395(f) [60.5395a(c)(1)] until such time as such tank or other vessel has been returned to service.

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## Storage Vessel Definition

- > Storage vessels that contain oil, condensate or “intermediate hydrocarbon liquid”
- > For the purposes of this subpart, the following are **NOT** considered storage vessels:
  - ❖ Vessels that are skid-mounted or permanently attached to something that is mobile (such as trucks, railcars, barges or ships), and are intended to be located at a site for less than 180 consecutive days. If you do not keep or are not able to produce records, as required by § 60.5420(c)(5)(iv), showing that the vessel has been located at a site for less than 180 consecutive days, the vessel described herein is considered to be a storage vessel since the original vessel was first located at the site.
  - ❖ Process vessels such as surge control vessels, bottoms receivers or knockout vessels.
  - ❖ Pressure vessels designed to operate in excess of 204.9 kilopascals (29.7 psi) and without emissions to the atmosphere.

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## Standards for Storage Vessels

- > Tanks with emissions  $\geq 6$  tpy:
  - ❖ Reduce VOC emissions by  $\geq 95.0$  percent through use of a control device or floating roof
  - ❖ If using a control device, equip with specified cover and connect through a closed vent system to a control device
  - ❖ If constructed, modified or reconstructed after 9/18/2015, P.E. certification on CVS
- > Tanks have 30 days from startup to calculate emissions and 60 days from startup to meet control requirements

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## NSPS Subpart 0000 and 0000a Storage Vessel Exit Ramp

- > Once uncontrolled emissions drop <4 tpy, the control device can be removed from the storage vessel;
  - ❖ Must be demonstrated through 12 consecutive month demonstration of emissions less than 4 tpy
- > Must re-calculate emissions monthly to ensure not >4 tpy
- > Must take into account anything that could increase emissions (e.g., fracking of a nearby well)

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## P.E. Certification and CVS

- > Ensure CVS is appropriately designed by approval from a qualified P.E. certification
  - ❖ Keep on file, submit with annual report
- > *Qualified Professional Engineer* means an individual who is licensed by a state as a Professional Engineer to practice one or more disciplines of engineering and who is qualified by education, technical knowledge and experience to make the specific technical certifications required under this subpart. Professional engineers making these certifications must be currently licensed in at least one state in which the certifying official is located.

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## Calculating Tank Emissions - Commonly Used Methods

- > TANKS 4.09d
- > HYSIS/PROMAX
- > E&P TANKS
- > Vasquez-Beggs
- > Pros and Cons to each....

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## Calculating Tank Emissions

- > TANKS 4.09d
  - ❖ Calculates working/breathing
  - ❖ Does not calculate flash
  - ❖ Output is a \*.txt file - not easily integrated with other software programs
  - ❖ No longer supported by EPA
- > HYSIS/PROMAX
  - ❖ Calculates flash
  - ❖ Incorporates AP-42 for working/breathing
  - ❖ Output is more “modern” and can be integrated more easily

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## Calculating Tank Emissions

- > E&P Tanks
  - ❖ Working, breathing and flash
  - ❖ Output is a \*.txt file - not easily integrated with other software programs
- > Vasquez-Beggs
  - ❖ Calculates flash
  - ❖ Can be combined with Tanks 4.09d
  - ❖ There are ranges outside of which this method is not appropriate
  - ❖ Some states will not accept this method!

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## When Do I Get More Sophisticated?

- > Spending \$ for equipment
  - ❖ Equipment sizing
- > Nearness to a regulatory limit
  - ❖ Compliance risk management

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## Storage Vessel Closed Vent Systems

- > Route emissions from the tank to a control device via a CVS.
- > Design and operate the CVS with no detectable emissions.
- > Conduct monthly OVA inspections of the CVS. Keep records.
- > If the CVS contains any bypass devices, you must:
  - ❖ Install a flow indicator with an alarm at inlet to the bypass;
  - ❖ Secure the bypass device valve using a car-seal or a lock-and-key;
  - ❖ ≤9/18/2015: Monthly visual inspection of the bypass car seal or lock. Keep records.
  - ❖ >9/18/2015: All above plus keep records of all instances of alarm
- > >9/18/2015: P.E. Certification of CVS

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## Storage Vessel Control Devices

- > For each enclosed combustion device (except for manufacturer-tested units), the owner/operator must:
  - ❖ Install and operate a continuous burning pilot;
  - ❖ Conduct the following monthly inspections and keep records:
    - ◆ OVA inspection of the control device to ensure integrity;
    - ◆ Visual inspection to confirm the pilot is lit;
    - ◆ Method 22 (observe for 15 min., smoke not to exceed 1 minute)

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## Storage Vessel Control Devices

- > For each manufacturer-tested combustion control device, the manufacturer must conduct certification tests and be approved by EPA
- > For manufacturer certified control devices, the owner/operator must
  - ❖ Measure inlet gas flow rate and ensure it is within the maximum limit established during manufacturer's test;
  - ❖ Ensure a pilot flame is present at all times of operation;
  - ❖ Monthly Method 22 (observe for 15 min., smoke not to exceed 1 minute)

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## Natural Gas Pneumatic Diaphragm Pumps

86

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## Definition: Natural Gas Driven Diaphragm Pump [60.5430a]

Natural gas-driven diaphragm pump means a positive displacement pump powered by pressurized natural gas that uses the reciprocating action of flexible diaphragms in conjunction with check valves to pump a fluid. A pump in which a fluid is displaced by a piston driven by a diaphragm is not considered a diaphragm pump for purposes of this subpart. A lean glycol circulation pump that relies on energy exchange with the rich glycol from the contactor is not considered a diaphragm pump.

87



## Pneumatic Pumps [60.5365a(h), 60.5393a]

- > Natural gas pneumatic diaphragm pumps located at a gas processing facility must have a bleed rate of 0 scf/h.
- > Natural gas pneumatic pumps at greenfield well sites must reduce emissions by 95%.
  - ❖ If control device cannot meet 95% reduction, must still connect to the control device & report reduction efficiency; or
  - ❖ If no control device is on-site and unable to route to a process, maintain records and “report.”
- > Well site exemption for limited-use pumps (operation < 90 days per year).

88



## Definition: Greenfield [60.5430a]

Greenfield site means a site, other than a natural gas processing plant, which is entirely new construction. Natural gas processing plants are not considered to be greenfield sites, even if they are entirely new construction.

89

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## Pneumatic Pumps [60.5365a(h), 60.5393a]

- > Natural gas pneumatic diaphragm pumps at non-greenfield well sites must reduce emissions by 95%
  - ❖ If control device cannot meet 95% reduction, must still connect to the control device & report reduction efficiency; or
  - ❖ If no control device is on-site and unable to route to a process, maintain records and report; or
  - ❖ If infeasible to route to control or process, submit P.E. certification to support claim of infeasibility
  - ❖ Infeasibility could be based on safety, distance, pressure losses/differentials, or the ability of the control to handle pump emissions

90

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## Leaks and Sweetening Units at Gas Processing Plants

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## Standards for VOC Leaks

- > Applies to equipment, except compressors, in VOC or wet gas service within a process unit at a natural gas processing plant
- > Process Unit - Components assembled for the extraction of natural gas liquids from field gas, the fractionation of the liquids into natural gas products, or other operations associated with the processing of natural gas products. A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the products.
- > Comply with NSPS Subpart VVa

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## Natural Gas Processing Plant

- > What is a “Natural Gas Processing Plant?”
  - ❖ “any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas to NGL products, or both. A JT valve, a dew point depression valve, or an isolated or standalone JT skid is not a natural gas processing plant.”



## Equipment Leaks at Gas Plants

Component	Leak Definition (ppm)	
	KKK	OOOO
Pumps in light liquid service	10,000	2,000
Valves in gas/vapor service	10,000	500
Valves in light liquid service	10,000	500
Connectors	Not subject	500
Pumps, valves and connectors in heavy liquid service; pressure relief devices in light liquid or heavy liquid service	AVO/ 10,000	AVO/ 10,000



## Standards for Sweetening Units at Gas Plants

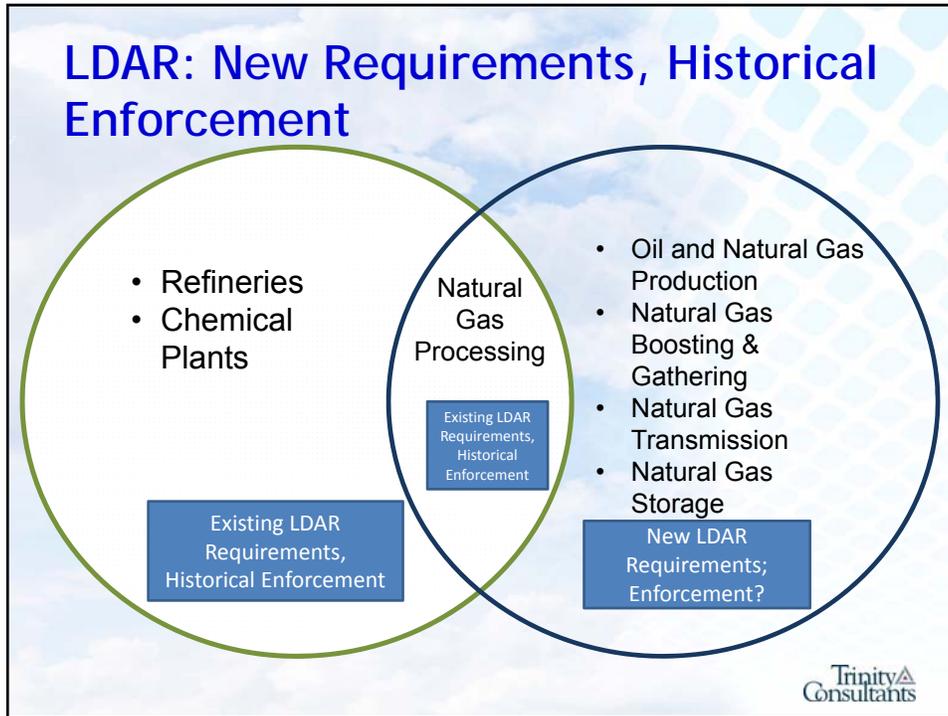
- > Applies to each onshore sweetening unit at a natural gas processing plant:
  - ❖ Emission limits remain the same as proposed rule (comply with percent reduction requirements based on sulfur feed rate and hydrogen sulfide [H<sub>2</sub>S] content of acid gas)
  - ❖ Initial performance test required
  - ❖ Monitoring of sulfur product accumulation, H<sub>2</sub>S content, and acid gas flow rate
- > Facilities with design capacities less than 2 long tons per day of H<sub>2</sub>S in the acid gas are subject to recordkeeping and reporting only

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## Fugitives at Well Sites and Compressor Stations

96

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## Fugitives at Well Sites and Compressor Stations [60.5397a]

- > Monitor fugitive emission components with an optical gas imaging (OGI) device or using Method 21 at all new, modified or reconstructed well sites and compressor stations after 9/18/2015.
- > Conduct surveys semi-annually at new or modified well sites.
  - ❖ Low production wells not exempted (i.e., 15 boe/day)
- > Conduct surveys quarterly at new or modified compressor stations.
  - ❖ Stations located in an area where average monthly temperature is <0 degrees for two consecutive months of a quarterly period can be waived - but not for two consecutive quarterly periods.

98

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## “Modification” to a Well Site [60.5365a(i)]

- > A “modification” occurs to a well site when:
  - ❖ A new well is drilled at an existing well site after 9/18/2015; or
  - ❖ A well at an existing well site has been hydraulically fractured or refractured after 9/18/2015.
- > A wellsite that contains only wellheads is not affected.
- > Tank batteries could be included - note the definition of “well site”.

99

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## Definition of Well Site [60.5430a]

Well site means one or more surface sites that are constructed for the drilling and subsequent operation of any oil well, natural gas well, or injection well. For purposes of the fugitive emissions standards at §60.5397a, well site also means a separate tank battery surface site collecting crude oil, condensate, intermediate hydrocarbon liquids, or produced water from wells not located at the well site (e.g., centralized tank batteries).

100

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## “Modification” to a Compressor Station [60.5365a(j)]

A compressor station is modified if:

- > An additional compressor is constructed at an existing compressor station; or
- > One or more compressors are replaced by one or more compressors of greater total horsepower.

101

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## Definition: Compressor Station [60.5430a]

Compressor station means any permanent combination of one or more compressors that move natural gas at increased pressure through gathering or transmission pipelines, or into or out of storage. This includes, but is not limited to, gathering and boosting stations and transmission compressor stations. The combination of one or more compressors located at a well site, or located at an onshore natural gas processing plant, is not a compressor station for purposes of §60.5397a.

102

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## Fugitives at Well Sites and Compressor Stations [60.5397a]

- > Conduct leak surveys within 60 days of startup of production or modification or by June 3, 2017 ~~(September 1, 2017)~~ (whichever is later).
- > Leaks are:
  - ❖ Any visible emission from a component using OGI; or
  - ❖ Reading of 500 ppm or more using Method 21.
- > Repair leaks within 30 days
  - ❖ Exceptions for repairs that would require a blowdown, shutdown, shut-in and other exceptions; and
  - ❖ Documentation requirements for such exceptions.
- > Re-survey within 30 days of repair using Method 21, OGI, or alternative screening procedure.

103

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## LDAR Monitoring Plans [60.5397a(c)]

- > LDAR Monitoring Plan must cover well sites and compressor stations within each company-defined area.
  - ❖ Company-defined area is not defined by EPA, but EPA expects them to be similar facilities in a similar geographic region.
- > Plans are not required to be submitted, but must be provided upon request.

104

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## LDAR Monitoring Plans [60.5397a(c)]

- > Plan must include:
  - ❖ Frequency of surveys
  - ❖ Method of surveys
  - ❖ Equipment details (make, model, manufacturer)
    - ◆ If using OGI, more details are required relating to exactly how the camera is calibrated and used
    - ◆ If using Method 21, details regarding instrumentation and tagging
  - ❖ Procedures and timeframes for identifying and repairing components

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## LDAR Monitoring Plans [60.5397a(c)]

- > Plan must include (Con't)
  - ❖ Record retention practices
  - ❖ Training requirements for those conducting surveys
  - ❖ Survey procedure
  - ❖ Site map
  - ❖ Defined observation path
  - ❖ Difficult to monitor and unsafe to monitor components

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## LDAR Deadline: June 3

~~(September 1)~~, 2017

1. Determine “company defined areas”
2. Document survey procedures
  1. LDAR Plan
  2. Field documentation
  3. File storage procedures
3. Conduct pilot program of surveys
4. Update documentation and survey procedures based on lessons learned
5. Train personnel or 3<sup>rd</sup> party on survey procedures
6. Complete first surveys at all affected sites no later than June 3, 2017 ~~(September 1, 2017)~~

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## Practical LDAR

### > SAFETY FIRST!

- ❖ Know the safety procedures for each site
- ❖ Do not use OGI in spaces with accumulated natural gas and obtain necessary Hot Work Permits
- ❖ Wear high waterproof boots when conducting surveys



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## Practical LDAR

- > Develop a plan and stick to it
  - ❖ Make updates to the plan to reduce number of reported deviations
- > Identify components to be monitored
- > Identify components NOT to be monitored
  - ❖ A “leak” is different from a “vent”
- > Know when it is appropriate to conduct a survey
  - ❖ Wind speed, temperature
- > Be cognizant of interference
  - ❖ Steam, “heat shimmer”

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## Practical LDAR

- > Ensure those conducting surveys are qualified
  - ❖ Differentiating between “leaks,” “vents” and interference can be an art form
  - ❖ Qualifications of those performing the surveys must be reported
- > Periodically evaluate LDAR surveys and practices to ensure Monitoring Plans are followed

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## Components

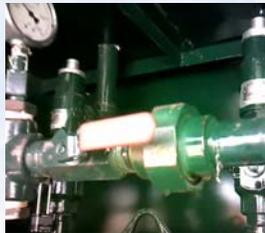


### Connectors

These components connect sections of pipe (ex. threaded connectors, tees, elbows).

### Flanges

These are piping connections where sections are bolted together.



### Valves

These are flow control devices on a pipeline (ex. check valve, needle valve, ball valve).

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## Common Equipment



### Christmas Trees

<http://buildipedia.com/aec-pros/engineering-news/extracting-natural-gas-from-shale?print=1>

### Injection Pumps

<http://www.donnan.com/Marcellus-Gas-Hickory.htm>



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## Common Equipment



Storage Tanks



Vapor Recovery Units

<http://hy-bon.com/products/vru/>



Meters

<http://www.instrument.com/products/38849/rosemount-3051cf-compact-orifice-flow-meter>



## Common Equipment



Gas Powered Pneumatic Controllers

<http://www.oemic.com/mallard/switches.htm>

Compressor Engines

<http://www.marcellus-shale.us/Marcellus-gas-facilities.htm>



## Common Equipment



Joule-Thompson Skids

<http://dewpointcontrol.com/jtUnits.html>

## Dehydration Units

<http://www.networkintl.com/lotdetail.aspx?slot=QFPIRA01G8VZ>



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## Common Equipment



## Combustor

<http://abutec.com/environmentally-friendly-vapor-combustors-flares-and-incinerators/>

## Engine and Generator Set

<http://www.duttapower.com/products.php>



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## General Compliance Requirements

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## Compliance Demonstration for Centrifugal Compressors

- > For centrifugal compressors with wet seals using control devices:
  - ❖ Initial performance test and periodic performance test within 60 months of previous test for certain control devices
  - ❖ Manufacturer tests can be used to replace on-site initial and periodic performance tests
  - ❖ Design analyses are allowed in lieu of a performance test for certain control devices (e.g., open flare, boiler, condensers, carbon adsorbers)

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## Compliance Demonstration for Centrifugal Compressors

- > Maintain daily average control device parameters above (or below) the minimum (or maximum) level established during the performance test
- > Prepare site-specific monitoring plan for continuous monitoring system
- > Conduct initial and annual inspections of covers and closed vent systems for leaks or defects

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## Notification Requirements

- > Hydraulically fractured wells
  - ❖ 2-day notification for completion activities
  - ❖ Also include in the annual report
- > Pneumatic controllers, pneumatic pumps, storage vessels, reciprocating compressors, and centrifugal compressors
  - ❖ Only include in annual report
- > Normal Subpart A notices for equipment leaks and sweetening units

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## Reporting Requirements [60.5420a]

- > Annual report deadline is 90 days after the end of the reporting period (June 3, 2016 + 60 days + 12 Months + 90 Days= Reporting Deadline 10/31/2017) (will not include LDAR for well sites and compressor stations)
- > Subsequent reports due on the same date as initial report
- > Can combine reports for multiple affected facilities [can coincide with Title V reports or can combine all pneumatics in one report]
- > Semiannual reports are required for equipment leaks (Subpart VVa)
- > Reporting will be required electronically once EPA has CEDRI forms available for 90 days



## Annual Report Content

- > Name, address, affected facility, reporting dates, and responsible official certification
- > Storage vessels:
  - ❖ Location
  - ❖ PTE and supporting documentation
  - ❖ P.E. certification if CVS is used
  - ❖ Deviations
  - ❖ Removed or returned to service 0000 or 0000a storage vessels
- > Well completion operations with fracking
  - ❖ Well IDs
  - ❖ Deviations from requirements that occurred during the reporting period
- > Centrifugal compressor using wet seals
  - ❖ List of affected units
  - ❖ Deviations



## Annual Report Content

- > Reciprocating compressors:
  - ❖ Number of hours (or months) of operation for reciprocating compressors or statement of closed vent system
  - ❖ Deviations
- > Sweetening units:
  - ❖ Excess emissions from sweetening units
- > Pneumatic controllers
  - ❖ Documentation that a bleed rate  $\geq 6$  scfh is required, if applicable
  - ❖ Deviations
- > Pneumatic pumps:
  - ❖ Certification that there is no control device or process or that it is infeasible to route emissions to a device or process or that emissions are routed to a control device or process.
  - ❖ Certification if a control device has been removed
  - ❖ Deviations

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## Annual Reports [60.5420a]

- > Fugitive emission components within the company defined area [60.5420a(b)(7)]
  - ❖ If claiming waiver due to low temperatures, record that a survey was waived and the months that make up the waived period
  - ❖ Date and time of survey
  - ❖ Name of operator performing survey, and qualifications (if OGI)
  - ❖ Survey conditions
  - ❖ Details on leaks, repairs, unsafe to monitor components, etc.
  - ❖ Deviations from monitoring plan

124

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## Recordkeeping

- > Information required in annual reports
- > Date, location, and manufacturer's specifications for pneumatic controllers
- > Emission calculations for storage vessels
- > Number of days a skid mounted or mobile source mounted storage vessel is located on site
- > All instances of alarm of bypass to a control device

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## Section 3 Case Studies and Discussion

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## Modifying a Wellsite

- > A wellsite that contains only wellheads is not affected.
- > Well site means one or more surface sites that are constructed for the drilling and subsequent operation of any oil well, natural gas well, or injection well. For purposes of the fugitive emissions standards at §60.5397a, well site also means a separate tank battery surface site collecting crude oil, condensate, intermediate hydrocarbon liquids, or produced water from wells not located at the well site (e.g., centralized tank batteries).

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## Modifying a Wellsite

- > A well site is constructed before 9/18/2015.
- > The site consists of wellheads only.
- > After 9/18/2015, the well site operator adds two reciprocating compressors, intermittent bleed pneumatic controllers, heaters, a tank and aboveground piping.
- > Is the site modified for purposes of LDAR?

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## Modifying a Well site

- > Modify a well site by:
  - ❖ Drilling a new well at an existing site;
  - ❖ Hydraulically fracturing an existing well.
  - ❖ “Modification” is defined in 0000a.
- > **No.** The site has not been modified for purposes of LDAR.
- > Has the well site been reconstructed?
  - ❖ There are no “reconstruction” definition for well sites and compressor stations in 0000a.
  - ❖ Therefore- look to Subpart A...

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## Reconstruction

- > The replacement of components of an existing facility...
  - ❖ ...to such an extent that the fixed capital cost of the new components exceeds 50% of the fixed capital cost that would be required to construct a comparable entirely new facility,
    - ◆ “Fixed capital costs” = capital needed to provide all the depreciable components
  - ❖ ...and it is technologically and economically feasible to meet applicable standards
- > **The facility has potentially been reconstructed and therefore subject to LDAR.**

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## Modifying a Wellsite

- > Wells are drilled at a pad after 9/18/2015
- > Oil production is low, and tank emissions are less than 6 tpy VOC per tank
- > Are the tanks subject to storage tank control requirements under 0000a?
- > Is the pad subject to LDAR requirements under 0000a?

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## Modifying a Wellsite

- > Tanks subject to control requirements under 0000a?
  - ❖ **No**- emissions are below 6 tpy VOC per tank
- > Is well site subject to LDAR requirements?
  - ❖ **Yes.**
  - ❖ Based on these considerations and, in particular, the large number of low production wells and the similarities between well sites with production greater than 15 boe per day and low production well sites in terms of the components that could leak and the associated emissions, we are not exempting low production well sites from the fugitive emissions monitoring program [p. 35856]

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## Modifying a Wellsite

- > A well is drilled after 9/18/2015 on a pad with only wellheads.
- > The well feeds into a centralized tank battery.
- > Where should the LDAR surveys be performed?

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## Modifying a Wellsite

- > LDAR is performed only at the **tank battery** only.

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## Modifying a Wellsite

- > A single wellpad is constructed before 9/18/2015
- > After 9/18/2015, a new well is drilled and completed
- > The new well is a different owner/operator than the other wellheads
- > What is the LDAR requirement?

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## Modifying a Wellsite

- > Response to Comments p. 4-221

**Commenter Name:** Gary Buchler  
**Commenter Affiliation:** Kinder Morgan, Inc.  
**Document Control Number:** EPA-HQ-OAR-2010-0505-6857  
**Comment Excerpt Number:** 10

**Comment:** EPA should revise its definition of “well site” to include only those facilities owned or operated directly by the producer. Any other definition would create significant implementation and compliance concerns.

**Response:** The collection of fugitive emission components at a well site, regardless of the owner or operator, is the affected facility and is subject to the fugitive emissions monitoring and repair program requirements specified in §60.5397a, including . The introductory text of §60.5365a states that “[y]ou are subject to the applicable provisions of this subpart if you are the owner or operator of one or more of the onshore affected facilities listed in paragraphs (a) through (j) of this section for which you commence construction, modification or reconstruction after September 18, 2015.” Therefore the owner or operator is responsible for complying with the applicable standards. The commenter should be mindful, however, of the definition of “owner or operator” in §60.2 of the General Provisions which states that owner or operator means “any person who owns, leases, operates, controls, or supervises an affected facility or a stationary source of which an affected facility is a part.” We believe that the resolution for any leaking components identified during surveys can be managed by the operator through cooperative agreements with other potential owners at the site.

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## Modifying a Wellsite

- > Yes - the ENTIRE well pad - and perhaps even an additional tank battery.
- > A “modification” occurs to a well site when:
  - ❖ A new well is drilled at an existing well site after 9/18/2015; or
  - ❖ A well at an existing well site has been hydraulically fractured or refractured after 9/18/2015.
- > Owner or operator means any person who owns, leases, operates, controls, or supervises an affected facility or a stationary source of which an affected facility is a part.

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## Field Gathering and Boosting Station - 0000a Applicability

- > Field gathering and boosting station constructed after 9/18/2015
  - ❖ Installation of screw compressors manufactured after 9/18/2015
  - ❖ Installation of a pneumatic pump manufactured after 9/18/2015
  - ❖ Installation of storage tanks with a PTE <6 tpy VOC per tank

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## Field Gathering and Boosting Station

- > Compressors have no requirements
  - ❖ 0000 and 0000a only apply to reciprocating and centrifugal compressors
- > No requirement for pneumatic pump
  - ❖ Only pumps at well sites and gas processing plants have requirements
- > Limited requirements for the tanks
  - ❖ Emissions <6 tpy/tank, but PE Cert for CVS *may* be required
- > **Site subject to LDAR because construction commenced after 9/18/2015**



## Transmission Compressor Station

- > Existing natural gas transmission compressor station
- > Addition of reciprocating compressor unit after 9/18/2015 that was manufactured <8/23/2011
- > No compressors were removed as part of the project



## Transmission Compressor Station

- > Only evaluate “new” sources
  - ❖ Compressor and driver (if applicable)
- > Site installed a compressor that is new to the facility, but not new for purposes of NSPS
- > Compressor has no rod packing replacement requirements because of manufacture date before 9/18/2015
- > Site is subject to LDAR because the addition of a compressor triggers “modification”

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## H<sub>2</sub>S Treatment Example

- > Facility is constructed after September 18, 2016
- > Facility consists of only a sulfur scrubbing device and two compressors
- > Is the sulfur scrubbing device considered a “sweetening unit” at a natural gas processing plant?
- > Is the facility subject to gas processing LDAR requirements?

142

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## Gas Processing Facility

- > **No to both.** The facility is not a gas processing plant.
- > What is a “Gas Processing Plant?”
  - ❖ NSPS 0000 and 0000a: “any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas to NGL products, or both. A JT valve, a dew point depression valve, or an isolated or standalone JT skid is not a natural gas processing plant.”

143

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## Gas Processing Facility

- > Subpart KKK - Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants for Which Construction, Reconstruction or Modification Commenced After January 20, 1984, and on or before August 23, 2011

144

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## Gas Processing Facility

- > What is “Gas Sweetening?”
  - ❖ Sweetening unit means a process device that removes hydrogen sulfide and/or carbon dioxide from the sour natural gas stream.
- > What is a “Gas Processing Plant?”
  - ❖ “any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas to NGL products, or both. A JT valve, a dew point depression valve, or an isolated or standalone JT skid is not a natural gas processing plant.”

145

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## Gas Processing Facility

- > HOWEVER - the facility **will be subject** to either well site or compressor station LDAR requirements.

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## Compressor Case Study

- > Existing compressor is equipped with larger driver.
- > Increase in combustion product emissions from the engine based on higher horsepower and fuel usage.
- > No physical changes to the compressor itself.
- > Is this a modification or reconstruction subjecting the compressor to NSPS Subpart 0000 or 0000a?
- > Is this a modification subjecting the station to LDAR?

147

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## Compressor Case Study

- > Affected facility means, with reference to a stationary source, any apparatus to which a standard is applicable. (§60.2)
- > Addition or replacement of equipment for the purpose of process improvement that is accomplished without a capital expenditure is not a modification (§60.5365(f)(1))
- > Increase in production rate accomplished without a capital expenditure is not a modification (§60.14(e))

148

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## Reconstruction

- > Remember...Only review the cost of the affected facility, not the “package”
  - ❖ Engine versus compressor
  - ❖ Tank versus berm
  - ❖ Pneumatic versus separator unit package
- > **No- the compressor was not modified as part of this change.**
  - ❖ The engine must be evaluated under NSPS for rules for engines.
- > Was the station modified for purposes of LDAR?

149

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## Modification for LDAR

A compressor station is modified if:

- > An additional compressor is constructed at an existing compressor station; or
- > One or more compressors are replaced by one or more compressors of greater total horsepower.
- > **No, but this is an evolving issue.**

Response to Comments, pp. 4-227 and 4-228: “We agree that an increase in compression capacity that is not due to the addition of a compressor that would result in an increase of the overall design capacity of the compressor station is not a modification.”

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## Compressor Case Study

- > A compressor manufactured and installed in 2008 is sold to another company.
- > Upon receipt of compressor on October 15, 2012, new company simply installs and commences operation.
- > Is this compressor subject to NSPS 0000?
- > Is the station subject to LDAR?

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## Relocation

- > As found in existing NSPS, the following actions (by themselves) are not considered modifications [§60.14(e)]:
  - ❖ The relocation or change in ownership of an existing facility.
- > How can relocation be proven?
  - ❖ Tracking life of a piece of equipment;
  - ❖ Manufacture date may not provide total protection.

152

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## Compressor Case Study

- > **No**- the compressor is not subject to requirements under NSPS 0000 or 0000a for compressors.
- > Is the station subject to LDAR?
  - ❖ **No**, even if the addition of the compressor results in a net compression horsepower increase, the date of installation was <9/18/2015

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## Reconstruction Case Study

- > A compressor is manufactured before 8/23/2011
- > In 2013, the compressor is damaged
- > In 2016, the damaged compressor is sold to another company
- > The company repairs the compressor to get the unit functioning again
- > Is this unit subject to NSPS 0000?

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## Routine Repair and Maintenance

- > Routine Repair and Maintenance is not a Modification
- > “Maintenance, repair, and replacement which the Administrator determines to be routine for a source Category.” [§60.14(e)(1)]
- > How should a company demonstrate “routine maintenance, repair, and replacement”?

155

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## Reconstruction...

- > 50% Rule: how much \$\$ was spent?
- > Is it cumulative? EPA is not consistent.
- > Is it back to promulgation of NSPS, or back to birth?
- > Reference Documents!
  - ❖ “when the extent of repairs goes beyond the normal maintenance activity necessary to maintain a boiler’s useful life, resulting in substantial life extension, the costs should be aggregated to determine if the repairs constitute re-construction.” (12/28/1992, Reconstruction of Subpart Dc Boiler)... or....
  - ❖ Conclusion: Amending Section 60.15 to authorize unlimited aggregation would best advance the purposes of Section 111. The current wording of Section 60.15 permits only the more limited policy of aggregating replacement costs stemming from what may be viewed objectively as a single planning decision.

156

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## Storage Vessel Case Study

- > A tank battery receiving crude from nearby wells is constructed on 8/25/2011.
- > The battery serves 1 nearby well and PTE of each tank is <6 tpy.
- > Are the tanks subject to NSPS Subpart 0000?

157

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## Storage Vessel Case Study

- > Date of construction is after 8/23/2011;  
BUT
- > Emissions are less than 6 tpy.
- > **Not subject.**

158

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## Storage Vessel Case Study

- > A tank battery receiving crude from nearby wells is constructed on 8/20/2011.
- > The battery serves 1 nearby well with emissions < 6 tpy.
- > On 9/1/2011, 10 more wells send product to the battery and each tank has emissions >6 tpy. No modifications are made to the battery to accommodate this change.
- > Are the vessels subject to control requirements of NSPS 0000?

159

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## Storage Vessel Case Study

- > **No.** The tank battery was constructed prior to 8/23/2011.
  - ❖ EPA Applicability Determination Index Control Number 9600032

[Discussion will likely commence]

### Abstract:

Q: If material contained in a storage tank is replaced with material with a different vapor pressure, is this replacement considered a modification according to NSPS ?

A: No, if the facility was originally designed to accommodate such material.

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## Storage Vessel Case Study

- > A tank battery is constructed after 8/23/2011.
- > Emissions are >6 tpy per tank.
- > In 2013, production declines.
- > Is there an exit ramp?

161

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## Exit Ramp

- > Emissions <4 tpy for 12 consecutive months, controls can be removed. BUT
- > Re-evaluate emissions monthly
- > Re-evaluate emissions upon fracturing or refracturing any wells feeding that tank
- > Replace controls if at any time emissions are >4 tpy

162

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## Storage Tank Construction

- > A tank battery is constructed in September 2014
- > The uncontrolled emissions are >6 tpy per tank VOC, but the site installs a combustor reducing VOC <6 tpy/tank
- > The battery receives a permit in January 2015 requiring the use of a combustor to control emissions
- > Is the tank battery subject to NSPS 0000?

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## Storage Tank Construction

- > **Yes**, the tank battery is subject to NSPS 0000, per 40cfr60.5365(e)

Each storage vessel affected facility, which is a single storage vessel located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment, and has the potential for VOC emissions equal to or greater than 6 tpy as determined according to this section by October 15, 2013 for Group 1 storage vessels and by April 15, 2014, or 30 days after startup (whichever is later) for Group 2 storage vessels, except as provided in [paragraphs \(e\)\(1\) through \(4\)](#) of this section. The potential for VOC emissions must be calculated using a generally accepted model or calculation methodology, based on the maximum average daily throughput determined for a 30-day period of production prior to the applicable emission determination deadline specified in this section. The determination may take into account requirements under a legally and practically enforceable limit in an operating permit or other requirement established under a Federal, State, local or tribal authority.

- > There would be a deviation to report as part of your annual NSPS 0000 report if the combustor wasn't in place before 60 days.

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## Storage Tank Modification

- > A tank battery is constructed before 8/23/2011
- > On 9/30/2015, one tank is struck by lightning and **replaced**
- > Is the new tank subject to NSPS 0000 or 0000a?

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## Storage Tank Modification

- > What is the tank's date of manufacture?
  - ❖ Is it after 8/23/2011? How do you know?
- > What is the tank's PTE?
  - ❖ Based on the first 30 days of production
  - ❖ Take into account federally enforceable limits
- > If >6 tpy VOC, the new tank is subject to NSPS 0000a
  - ❖ Reduce emissions by 95% within 60 days after startup

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## Routine Repair and Maintenance

- > Routine Repair and Maintenance is not a Modification
- > “Maintenance, repair, and replacement which the Administrator determines to be routine for a source Category.” [§60.14(e)(1)]
- > How should a company demonstrate “routine maintenance, repair, and replacement”?

167

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## Demonstrating “Routine”

- > Document, document, document
  - ❖ Manufacturer’s Data
- > Check the ADI
  - ❖ Tricky because sources are previously un-regulated
- > Industry Trade Groups
  - ❖ API, local O&G associations
  - ❖ May be difficult to reach consensus
- > Individual Company Case-by-Case
  - ❖ May be unpalatable/unreasonable across large geographic areas
  - ❖ May be difficult to reach consensus

168

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## Storage Tank Re-Construction

- > A tank battery is constructed before 8/23/2011
- > On 9/30/2015, one tank is struck by lightning and repaired
- > Is the repaired tank subject to NSPS 0000 or 0000a?

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## Storage Tank Re-Construction

- > What was done to the tank to repair it?
  - ❖ Parts
  - ❖ Labor
  - ❖ Engineering/design
- > How much money was spent on the tank?
  - ❖ Was it greater than 50% of the fixed capital cost of an entirely new tank?
- > What is the tank's PTE?
- > If BOTH 50% has been exceeded AND emissions >6 tpy, the new tank is NSPS 0000a

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**Examples?**

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**Questions?**

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