

# Oil and Natural Gas Sector Air Regulations Update

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Office of Air and Radiation

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# Overview

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- ▶ Brief review of EPA's air regulatory authorities for this sector
- ▶ 2012 air regulations
- ▶ 2013 storage vessel amendments
- ▶ 2014 well completion amendments in progress
- ▶ White paper process

# New Source Performance Standards (NSPS)

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- ▶ Authority: section 111(b) of Clean Air Act (CAA)
- ▶ Primarily regulate criteria pollutants and precursors from new, modified and reconstructed sources
  - ▶ Ozone (via precursors VOC\* and NOx\*)
  - ▶ Sulfur dioxide
  - ▶ Nitrogen dioxide
  - ▶ Particulate matter
  - ▶ Carbon monoxide
  - ▶ Lead
- ▶ Concept -- NSPS must reflect “best system of emission reductions”
- ▶ Must be reviewed every 8 years to determine whether technology advances warrant updating the requirements

\*Volatile organic compounds (VOC) and oxides of nitrogen (NOx)

# National Emission Standards for Hazardous Air Pollutants (NESHAP)

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- ▶ Section 112 of the CAA requires EPA to control a specific list of air toxics from new and existing sources
- ▶ Pollutants of primary concern to oil and natural gas sector:
  - ▶ benzene, toluene, ethylbenzene, mixed xylenes (BTEX)
  - ▶ n-hexane
- ▶ Concept -- technology-based standards that require what the best facilities are doing (maximum achievable control technology -- MACT)
- ▶ Requires risk and technology review (RTR)
  - ▶ One-time residual risk assessment 8 years after promulgation of MACT to determine if existing rule provides an ample margin of safety
  - ▶ Technology review every 8 years to determine if technology advances warrant updating the requirements

# Some Regulatory History

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- ▶ 1985 - NSPS KKK (VOC) and LLL (SO<sub>2</sub>) for gas processing plants
- ▶ 1999 - NESHAP HH for oil & natural gas production facilities
- ▶ 1999 - NESHAP HHH for natural gas transmission & storage facilities
- ▶ 2007 - Area source NESHAP HH for oil & natural gas production
  
- ▶ 08/23/11 - Proposed new NSPS OOOO and updated NESHAP HH & HHH
- ▶ 08/16/12 - Published final rules for OOOO, HH and HHH
- ▶ 10/15/12 - Received petitions for reconsideration of OOOO, HH and HHH
- ▶ 04/12/13 - Proposed storage vessel implementation amendments (NSPS 1)
- ▶ 09/23/13 - Published final storage vessel implementation amendments
- ▶ 07/17/14 - Proposed clarifications to well completion provisions (NSPS 1.5)

# NSPS - Well Completions

- ▶ Applies to all hydraulically fractured gas wells, both new wells and existing wells that are fractured or refractured
- ▶ Beginning 1/1/15, the rule requires “green completions” for most wells
- ▶ Requires flaring in situations not meeting criteria for green completions (and where flaring is not a hazard)
  - ▶ Wildcat and delineation wells
  - ▶ Low pressure wells
  - ▶ Wells completed from 10/15/12 to 12/31/14



*Green Completion Equipment*  
(Source: Weatherford)



*A natural gas well site. EPA photo.*

# NSPS - Pneumatic Controllers and Equipment Leaks

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- ▶ **Pneumatic controllers at oil & gas production facilities**
  - ▶ Requires “low-bleed” controllers (gas bleed rate  $\leq$  6 scfh )
  - ▶ Exempts critical applications requiring high-bleed, gas-actuated controllers due to functional requirements
- ▶ **Pneumatic controllers at gas processing plants**
  - ▶ Requires continuous bleed, natural gas-actuated controllers to have zero gas bleed rate
- ▶ **Equipment leaks at gas processing plants**
  - ▶ Upgrades leak detection and repair (LDAR) for gas processing plants to lower leak threshold (500 ppm vs. 10,000 ppm)

# NSPS - Compressors and Storage Vessels

## ▶ Centrifugal Compressors

- ▶ Dry seal compressors not affected
- ▶ 95% control for wet seal compressors

## ▶ Reciprocating Compressors

- ▶ Requires replacement of rod packing
- ▶ 26,000 hours of operation or every 3 years, regardless of hours of operation

## ▶ Storage vessels

- ▶ 95% control for tanks  $\geq 6$  tpy VOC PTE
- ▶ First compliance date 10/15/13
- ▶ Reconsidered in 2013 (details later)



*A combustion device and storage tanks  
EPA photo*

# NSPS - 2013 Storage Vessel Amendments

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- ▶ Clarified which tanks are subject to the rule
  - ▶ Revised definition of “storage vessel” – based on tank contents
    - Crude oil
    - Condensate
    - Intermediate hydrocarbon liquids
    - Produced water
  - ▶ Revised “affected facility” description – based on tank emissions
    - Storage vessels with potential to emit VOC  $\geq$  6 tpy
    - PTE takes into account any legally and practically enforceable permit or other limitation
    - PTE does not include any vapor recovered and routed to a process

# NSPS - 2013 Storage Vessel Amendments, continued

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## ▶ Phases in control dates for storage vessels constructed since NSPS proposal

- ▶ **Group 1** (constructed between August 23, 2011 and April 12, 2013)
  - Estimate emissions by October 15, 2013 to determine “affected facility” ( $\geq 6$  tpy)
  - Submit one-time notification with first annual report (were due by January 16, 2014)
  - Control by April 15, 2015
- ▶ **Group 2** (constructed after April 12, 2013)
  - Estimate emissions by April 15, 2014 or within 30 days of startup, whichever is later
  - Control by 60 days after startup

## ▶ Alternative emission limits

- ▶ 95% control, **or**
- ▶ Limit uncontrolled emissions to  $<4$  tpy
  - Uncontrolled emissions must be  $<4$  tpy for at least 12 consecutive months
  - Must estimate emissions monthly
  - Allows controls to be removed and potentially reused at another location
  - If emissions reach 4 tpy, must apply 95% control

# NSPS - Time-Critical Clarifications (NSPS 1.5)

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- ▶ January 1, 2015 compliance date for reduced emissions completion (REC) requirement for most hydraulically fractured gas wells
- ▶ EPA previously provided clarification letter to American Petroleum Institute addressing several issues following the 2012 final NSPS
- ▶ On July 17, 2014, published proposed amendments to clarify requirements and to add definitions of key terms
- ▶ Public comment period closed August 18, 2014
- ▶ NSPS 1.5 final rule scheduled prior to January 1, 2015 compliance date

# Highlights of NSPS 1.5 Proposal

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- ▶ Provides additional detail on requirements of handling of gas and liquids during well completion operations
- ▶ Clarifies requirements for storage tanks removed from service
- ▶ Defines low-pressure wells
- ▶ Clarifies certain requirements for leak detection at natural gas processing plants
- ▶ Updates requirements for reciprocating compressors; and
- ▶ Updates the definition of “responsible official.”

# 2012 NESHAP Improvements

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## ▶ Oil and Natural Gas Production (HH)

- ▶ Glycol dehydrators
  - Sets new standards for small dehydrators at major sources
- ▶ Equipment leaks at gas plants
  - Strengthens requirements for leak detection and repair

## ▶ Natural Gas Transmission & Storage (HHH)

- ▶ Glycol dehydrators
  - Sets new standards for small dehydrators



*Glycol dehydrators at a well production pad  
EPA photo*

# Obama Administration Strategy to Reduce Methane Emissions

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- ▶ Strategy released March 2014
- ▶ Sets forth plan to reduce domestic and international methane emissions
- ▶ Targets four key sources
  - ▶ Landfills
  - ▶ Coal Mines
  - ▶ Agriculture
  - ▶ Oil and Gas
- ▶ Strategy for oil and gas includes the release of five white papers on potentially significant sources of methane

# White Paper Overview

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## ▶ Purpose

- ▶ Obtain a common understanding of emerging data on emissions and control for certain potentially significant sources of VOCs and methane
- ▶ Focus on technical issues
- ▶ Part of Obama Administration's *Strategy to Reduce Methane Emissions*

## ▶ Topics

- ▶ Compressors
- ▶ Completions and ongoing production of hydraulically fractured oil wells
- ▶ Leaks
- ▶ Liquids unloading
- ▶ Pneumatic devices

## ▶ Status

- ▶ Released on April 15, 2014, for external peer review and made publicly available
- ▶ Peer review was completed by June 16, 2014
- ▶ Currently assessing information received from reviewers and the public

# For Additional Information

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▶ Visit: [www.epa.gov/airquality/oilandgas](http://www.epa.gov/airquality/oilandgas)

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