Oil and Natural Gas Sector Regulatory Program Update

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Overview

► EPA’s air regulations for the oil and natural gas sector
► 2012 rulemaking
► Status of reconsideration
► Technical white papers
New Source Performance Standards (NSPS)

- 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)

- 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

- 1985 - NSPS KKK (VOC) and LLL (SO₂) 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 NSPS-1 final rule
- 11/22/13 - Received petitions for reconsideration of NSPS-1
2012 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
2012 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 ≥ 6 tpy VOC PTE
  - First compliance date 10/15/13
  - Reconsidered in 2013 (details later)
Pneumatic controllers at oil & gas production facilities
- Requires “low-bleed” controllers (gas bleed rate ≤ 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 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)
2012 NESHAP Amendments

► 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
  ► Storage Vessels
    • Amends definition of "associated equipment" to allow storage vessel emissions to be counted toward major source determination at well sites

► Natural Gas Transmission & Storage (HHH)
  ► Glycol dehydrators
    • Sets new standards for small dehydrators

Glycol dehydrators at a well production pad
EPA photo
Petitions for Reconsideration

- Received 12 petitions for reconsideration and 9 petitions for judicial review

- EPA is currently addressing the NSPS and NESHAP issues separately
  - NSPS-1  Storage vessel implementation revisions
  - NSPS-1.5  Time-critical clarification of well completion requirements
  - NSPS-2  Remaining issues
  - NESHAP
Storage Vessels Reconsideration (NSPS-1)

► 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
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” (≥ 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
  - 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
Storage Vessels (NSPS-1), continued

- Streamlined monitoring requirements (while we continue to evaluate)
  - Removed field performance testing and replaced with requirement to use controls “designed for” 95% control
  - Streamlined site inspection requirements by requiring only 15-minute Method 22 combustor check and auditory, visual, and olfactory check of storage vessel cover and closed vent system to be performed monthly

- Revised protocol for manufacturer-conducted tests of combustors
  - Reconciled NSPS language with that in the NESHAP, which was already correct
  - Manufacturers submit test results to EPA, who reviews and posts results on website

- Extended time for operators to submit annual report and compliance certification for all affected facilities under NSPS from 30 to 90 days
Time-Critical Clarifications (NSPS-1.5)

- 1/1/15 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

- Work underway to amend rule to clarify requirements and to add definitions of key terms

- NSPS-1.5 final rule scheduled prior to 1/1/15 REC compliance date
Obama Administration Strategy to Reduce Methane Emissions

► 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

► 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
  ► Peer review to be completed by June 16, 2014
  ► Accepting technical information and data from the public until June 16, 2014
White Paper Structure

► Problem Statement
  ► Define the source(s)
  ► Define the context

► Available Emissions Data and Estimates
  ► Summarize and compare the various data sources and estimates
  ► Characterize quantity, geographic dispersion, distribution across sources

► Available Control Technologies
  ► Cost, efficacy, and prevalence of technologies

► Charge Questions for Reviewers
  ► Technical questions of particular interest to EPA
White Paper Next Steps

► June 16, 2014
  ► Peer review deadline
  ► Deadline for accepting technical information and data from the public

► Summer 2014
  ► Submitted info and reviews will be made available
  ► Review submitted info

► Fall 2014
  ► Determine how best to pursue further methane reductions

► End of 2016
  ► If EPA decides to develop additional regulations, complete those regulations
For Additional Information

► Visit: www.epa.gov/airquality/oilandgas

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Appendix
White Paper Charge Questions: Compressors

- Appropriate characterization of the different studies and data sources
- Ongoing or planned studies on this source of emissions
- Full range of technologies available to reduce vented compressor emissions
- Technical limitations to replacement of wet seals with dry seals
- Technical reasons for using a wet seal compressor without a gas recovery system
- Technical limitations to installation of gas capture systems at reciprocating compressors
- Specific applications that require wet seal compressors
White Paper Charge Questions: Completions and Ongoing Production of Hydraulically Fractured Oil Wells

- Appropriate characterization of the different studies and data sources
- Ongoing or planned studies on this source of emissions
- Full range of technologies available to reduce emissions
- Hydraulically fractured oil well completions
  - Methodologies for estimating completion emissions and rate of recompletions
  - Feasibility/cost of “green completions” at oil wells
  - Feasibility/cost of completion combustion devices at oil wells
- Ongoing production from hydraulically fractured oil wells
  - Methodologies for estimating associated gas emissions
  - Availability of pipeline infrastructure in tight oil formations
White Paper Charge Questions: Leaks

- Appropriate characterization of the different studies and data sources
- Ongoing or planned studies on this source of emissions
- Types of facilities more prone to leaks
- Full range of technologies available to detect leak emissions
- Applicability of detection and repair techniques to both oil and gas wells
- Comparison of the cost of detecting vs. cost of repairing a leak
- Necessity of leak detection technologies to quantify emissions
- State of innovation in leak detection technologies
White Paper Charge Questions: Liquids Unloading

- Appropriate characterization of the different studies and data sources
- Ongoing or planned studies on this source of emissions
- Full range of technologies available to reduce emissions
- Types of wells most likely to require liquids unloading
- Ability of plunger lift systems to perform liquids unloading without any air emissions
- Pros and cons of installing a “smart” automation system as part of a plunger lift system
- Feasibility of the use of flares during liquids unloading operations
- Rationale of performing blowdowns instead of using more effective liquid removal technologies
White Paper Charge Questions: Pneumatic Devices

- Appropriate characterization of the different studies and data sources
- Ongoing or planned studies on this source of emissions
- Full range of technologies available to reduce emissions
- Explanation for wide range of emission rates from pneumatic controllers
- Barriers to installing instrument air systems
- Barriers to using instrument air-driven controllers and pumps
- Limitations of electric-powered pneumatic controllers and pneumatic pumps