NSPS Subpart 0000: Applicability and Compliance Basics

Kentucky Oil & Gas Association
2013 Western Kentucky Meeting
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Introduction

- Environmental Standards, Inc.
- All4 Inc.

Your environmental compliance is clearly our business.
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Presentation Overview

- General Applicability
- Affected Facilities
- Rule Structure
- Storage Vessel Affected Facilities
  - Standards for storage vessel affected facilities
  - Recordkeeping for storage vessel affected facilities
  - Reporting for storage vessel affected facilities
  - Compliance for storage vessel affected facilities
- Gas Well Affected Facilities
  - Standards for gas well affected facilities
  - Recordkeeping for gas well affected facilities
  - Reporting for gas well affected facilities
  - Notification for gas well affected facilities
  - Compliance for gas well affected facilities
General Applicability

- Commence construction, modification or reconstruction after August 23, 2011
  - Construction
  - Modification
  - Reconstruction
- Presentation will address:
  - Storage vessels
  - Gas wells
Subpart O000 Affected Facilities

- Gas wells
- Centrifugal compressors
- Reciprocating compressors
- Pneumatic controllers
- Storage vessels
- Leak standards at onshore processing plants
- Sweetening units at onshore natural gas processing plants
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- **Determining applicability**
  - Effective date
  - Construction, reconstruction, or modification
- **Deadlines**
- **Standards**
- **Compliance Demonstration**
- **Monitoring**
- **Testing**
- **Notification, recordkeeping, and reporting**
Storage Vessels

- Storage vessel is a tank containing:
  - Crude oil,
  - Condensate,
  - Intermediate hydrocarbon liquids, or
  - Produced water

- Storage vessels are not:
  - Skid-mounted or permanently attached to something that is mobile and on-site for < 180 consecutive days
  - Process vessels
  - Pressure vessels
Storage Vessels Affected Facility

- Single storage vessel
  - Oil and natural gas production segment
  - Natural gas processing segment
  - Natural gas transmission and storage segment

- Potential to emit (PTE) of volatile organic compound (VOC) emissions ≥ than 6 tpy
  - PTE determined using a generally accepted model or calculation methodology
  - Based on the maximum daily throughput
  - Can rely on enforceable limitations to < 6 TPY VOC
  - PTE based on VOC emissions after any vapor recovery unit (VRU)
Storage Vessels

- What is a “generally accepted model or calculation methodology”
  - Not specified by the rule, but examples provided by U.S. EPA in response to comment document include:
    - API’s E&P TANK software
    - Vasquez-Beggs Equation (VBE)
    - Gas oil ratio (GOR) calculations
    - Process simulation software:
      - HYSIM, HYSYS, WINSIM, and PROSIM
    - TANKS 4.0 Calculations from AP-42
      - For working and breathing losses only
Storage Vessels

- State-specific tank emission protocols:
  - California Air Resource Board (CARB)
    - Draft Determination of Methane, Carbon Dioxide, and Volatile Organic Compounds from Crude Oil and Natural Gas Separation and Storage Tank Systems
  - Wyoming:
    - [http://deq.state.wy.us/aqd/Oil%20and%20Gas/March%202010%20FINAL%20O%26%20G%20GUIDANCE.pdf](http://deq.state.wy.us/aqd/Oil%20and%20Gas/March%202010%20FINAL%20O%26%20G%20GUIDANCE.pdf)
  - Texas
### Example Wyoming Protocol

<table>
<thead>
<tr>
<th>Method</th>
<th>Emissions Calculated</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct measurement</td>
<td>Working</td>
<td>Sampling and lab analysis required. Results are relatively accurate.</td>
</tr>
<tr>
<td></td>
<td>Working</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breathing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flash</td>
<td></td>
</tr>
<tr>
<td>Process Simulator</td>
<td>Flash only</td>
<td>PROMAX, HYSIM, HYSIS, etc. Software is expensive but results are accurate when based on site-specific sampling and lab analysis.</td>
</tr>
<tr>
<td>AP E&amp;P Tanks Software V 2.0</td>
<td>Working</td>
<td>Requires site specific sampling. Not as accurate as more expensive process simulators and no longer supported by the software producer (American Petroleum Institute).</td>
</tr>
<tr>
<td></td>
<td>Working</td>
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<tr>
<td></td>
<td>Breathing</td>
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</tr>
<tr>
<td></td>
<td>Flash</td>
<td></td>
</tr>
<tr>
<td>Laboratory measurement of the Gas-Oil-Ratio (GOR) from a pressurized liquid sample</td>
<td>Flash only</td>
<td>This is a direct laboratory analysis of the flash vapors emitted from a pressurized oil/condensate sample.</td>
</tr>
<tr>
<td>EPA Tanks 4.0.9d</td>
<td>Working</td>
<td>Program distributed by the EPA through their website at: <a href="http://www.epa.gov/tnn/chief/efpac/efsoftware.html">http://www.epa.gov/tnn/chief/efpac/efsoftware.html</a></td>
</tr>
<tr>
<td></td>
<td>Breathing only</td>
<td></td>
</tr>
</tbody>
</table>

From Chapter 6, Section 2, page 22 of Wyoming Permitting Guidance for Oil and Gas Production Facilities: http://deq.state.wy.us/aqd/Oil%20and%20Gas/March%202010%20FINAL%20O&G%20GUIDANCE.pdf
Storage Vessels

- **Group 1 storage vessels**
  - Storage vessel for which construction, modification, or reconstruction commenced after August 23, 2011 and on or before April 12, 2013
    - Determine VOC PTE by October 15, 2013
    - Comply (install capture and controls) by April 15, 2015

- **Group 2 storage vessels**
  - Storage vessel for which construction modification, or reconstruction commenced after April 12, 2013
    - Determine VOC PTE by the later of April 15, 2014 or 30 days after start-up
    - Comply (install capture and controls) by the later of April 15, 2014 or 60 days after start-up
Standards for Storage Vessel Affected Facilities

- **Group 1 storage vessels**
  - Submit notification identifying location of each Group 1 vessel with initial annual report
  - Reduce VOC emissions by 95% by April 15, 2015 or
  - Maintain uncontrolled VOC to < 4 TPY after demonstrating that uncontrolled VOC emissions have been < 4 TPY for 12 consecutive months
  - Uncontrolled VOC emissions determined on a monthly basis thereafter using average throughput for the month
Standards for Storage Vessel Affected Facilities

- Group 2 storage vessels
  - Reduce VOC emissions by 95% by April 15, 2014 or within 60 days after startup or
  - Maintain uncontrolled VOC to < 4 TPY after demonstrating that uncontrolled VOC emissions have been < 4 TPY for 12 consecutive months
  - Uncontrolled VOC emissions determined on a monthly basis thereafter using average throughput for the month
Conditions regarding uncontrolled 4 TPY VOC compliance option if conditions at well change:

- If well undergoes fracturing or re-fracturing:
  - Reduce VOC emissions by 95% as soon as liquids from the well are routed to the storage vessel

- If VOC emissions increase to > 4 TPY without fracturing or re-fracturing:
  - Reduce VOC emissions by 95% within 30 days of the determination
Standards for Storage Vessel Affected Facilities

- Storage vessels removed from service
  - Submit notification in annual report identifying all affected vessels that are removed from service during the period
  - If returning to service and associated with fracturing
    - Comply with control requirement options immediately
    - Submit notification in annual report
  - If returning to service and not associated with fracturing
    - Determine VOC emissions within 30 days
    - If uncontrolled VOC emissions ≥ 4 TPY must comply with control requirements within 60 days of return to service
    - Submit notification in annual report
Standards for Storage Vessel Affected Facilities

Storage vessel control requirements

• Control device option
  • Storage vessel cover and all openings must form continuous impermeable barrier over the entire surface area of the liquid
  • Liquids, gases, and fumes must vent through a closed vent system to a control device or process

• Floating roof option
  • Meet requirements of 40 CFR Part 60 Subpart Kb

• Vapor recovery units (VRU) must meet closed vent system requirements and have an operational uptime of 95%
Controls for Storage Vessel
Affected Facilities

- **Covers**
  - Cover and all openings on the cover shall form a continuous barrier over the entire surface area of the liquid in the storage vessel.
  - Each cover opening shall be secured in a closed, sealed position (gasket lid or cap) whenever material is in the unit...
  - Each storage vessel thief hatch shall be weighted and properly seated...

- **Closed vent system (CVS)**
  - Design the CVS to route all gases, vapors, and fumes emitted from the material in the storage vessel to a control device.
  - Design/operate a CVS with no detectable emissions, as determined using olfactory, visual and auditory inspections.
  - Meet control system bypass requirements as applicable.
Controls for Storage Vessel
Affected Facilities

Control device

- Enclosed combustion device (e.g., thermal vapor incinerator, catalytic vapor incinerator, boiler, or process heater)
- Designed to reduce the mass content of VOC emissions by 95.0 percent or greater
  - Ensure that each enclosed combustion device is maintained in a leak free condition
  - Install and operate a continuous burning pilot flame
  - Operate the enclosed combustion device with no visible emissions
- Operation of control devices at all times when gases, vapors, and fumes are vented from the storage vessel affected facility through the closed vent system
Closed Vents and Covers

- Conduct monthly olfactory, visual and auditory inspections for defects that could result in air emissions

Control devices

- Monthly visible emissions test (Method 22)
  - >14 days between tests
- All inspection, repair and maintenance activities for each unit must be recorded in a maintenance and repair log and must be available for inspection
- Continuous parametric monitoring system
  - Combustion zone temperature for thermal oxidizers
Control device

- Testing exemptions
  - Certain flares and boilers
  - Performance test conducted by the manufacturer

- Testing requirements
  - EPA Methods to determine sample port location and gas volumetric flowrate
  - Collection of integrated bag samples or grab samples
  - EPA Method 25A at inlet and outlet of control device
  - Calculation of control device efficiency on a mass basis

- Test schedule
  - Initial compliance test 180 days after start-up
  - Testing every 60 months thereafter
Recordkeeping for Storage Vessel Affected Facilities

- VOC PTE determination for each storage vessel with calculation methodology and/or calculation model used
- Deviations from requirements
- Mobile vessel consecutive days on site
  - If removed and returned or replaced within 30 days, entire period will count as consecutive days
- Closed vent system inspections and results
- Control devices:
  - Minimum and maximum operating parameter values
  - Continuous parameter monitoring data
  - Results of all compliance calculations
  - Results of all inspections

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Reporting for Storage Vessel Affected Facilities

- Initial annual report due January 15, 2014
- Subsequent reports due 90 days following end of reporting period
  - General information
  - Storage vessel information
    - Identification and location of each storage vessel affected facility constructed, modified, or reconstructed during the period
    - Documentation of VOC emission rates
    - Records of deviations that occurred during the reporting period
    - Identification of each Group 1 storage vessel with location coordinates
    - Compliance statement regarding initial compliance requirements
    - Storage vessel affected facilities removed from service
    - Storage vessel affected facilities returned to service
Compliance for Storage Vessel Affected Facilities

- **Initial compliance**
  - Determine potential VOC emission rate
  - Reduce VOC emissions as required
  - Meet control requirements
  - Submit required notification information
  - Maintain required records
  - Submit Group 1 notifications

- **Continuous Compliance**
  - Reduce VOC emissions as specified
  - Demonstrate continuous compliance with performance requirements
    - Cover and closed vent system
    - Control devices
Gas Wells

- Gas well affected facility
  - Gas well or natural gas well means an onshore well drilled principally for production of natural gas

- Key distinctions
  - Delineation wells
  - Low pressure gas wells
  - Wildcat wells
Standards for Gas Wells

- Completions with hydraulic fracturing begun before January 1, 2015
  - Capture/direct flowback to a completion combustion device (with reliable continuous ignition source)
  - Exceptions include fire/explosion hazards, or where high heat may negatively impact tundra, permafrost or waterways
  - “General duty” to “safely maximize resource recovery and minimize releases to the atmosphere during flowback and subsequent recovery”
Standards for Gas Wells

- Completions with hydraulic fracturing begun after January 1, 2015:
  - Route the recovered liquids into one or more storage vessels or re-inject the recovered liquids into the well or another well and;
  - Route the recovered gas 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, with no direct release to the atmosphere.
Standards for Gas Wells

- Completions with hydraulic fracturing begun after January 1, 2015 (cont.):
  - All salable quality gas must be routed to the gas **flow line** as soon as practicable
    - Flow line means a pipeline used to transport oil and/or gas to a processing facility, a mainline pipeline, re-injection, or routed to a process or other useful purpose
    - In cases where flowback emissions cannot be directed to the flow line
      - Capture/direct flowback to a completion combustion device (with reliable continuous ignition source)
All completions with hydraulic fracturing:

- Records of completions
- Records of deviations
- Daily log records for each completion:
  - Post-January 1, 2015 - location, API well No., duration (hours) of flowback, duration of recovery to flow line, duration of combustion, duration of venting, and reasons for venting
  - Pre-January 1, 2015 – same as above, except for recovery to flow line requirements
- Exemption records (e.g., fire, explosion, heat, etc.)
- Records of required digital photographs (for post January 1, 2015 completions)
Reporting for Gas Wells

- **Annual reports**
  - Initial report due January 15, 2014
  - Subsequent reports due 90 days following end of the reporting period
- **General information**
  - Company name and address
  - Identification of each facility included
  - Beginning and end date of the report period
  - Certification of truth, accuracy, and completeness
- **Gas well information**
  - Records of each well completion operation for each gas well affected facility conducted during the reporting period or a list of completions with hydraulic fracturing and associated records
  - Records of deviations that occurred during the reporting period
Notifications for Gas Wells

- Commencement of well completion
  - Electronic or written notification two (2) days prior to the commencement of each completion
    - The anticipated commencement date
    - Contact information of owner/operator
    - API well number
    - Latitude/longitude coordinates
    - Planned flowback date
  - State advance notice requirements are acceptable
Compliance for Gas Wells

- **Initial compliance** is demonstrated by:
  - Submit required notifications/annual report
  - Maintain completion logs
  - Maintain records of digital photographs of completions (for post January 1, 2015 completions):
    - Date and latitude/longitude imbedded or stored with the digital file
    - Equipment for storing or re-injecting recovered liquid
    - Equipment for routing recovered gas to the gas flow line
    - The completion combustion device (if applicable) connected to and operating at each gas well completion

- **Continuous compliance** is demonstrated by:
  - Submitting required reports
  - Maintaining required records
Key Points to Take Away

- Subpart OOOO is a complicated rule with many “moving parts”
- Broad applicability over entire oil and gas sector
- Determining if a tank is a “storage vessel affected facility” will likely require process/emissions sampling
- Time is of the essence
  - Deadline for Group 1 tank VOC emissions determination is October 15, 2013
  - Annual report for initial compliance period is due January 15, 2014
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