



Oil and Natural Gas Sector: Compliance Guidance for Subpart OOOO Requirements for Storage Vessels

Prepared for the Independent Petroleum Association of America

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I. INTRODUCTION

On August 16, 2012, the United States Environmental Protection Agency (“EPA”) published the “Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Review.” The regulations are found at Subpart OOOO of 40 C.F.R. Part 60, 40 C.F.R. §§ 60.5360 *et seq* (hereafter “Subpart OOOO”). On April 12, 2013, in conjunction with ongoing litigation over the rulemaking, EPA proposed amendments to the August 16, 2012 standards, which primarily related to the requirements for storage vessels. The amendments were finalized on August 2, 2013.¹ The finalized amendments contain important changes from EPA’s original proposal and require action on the part of storage vessel owners and operators as soon as October 15, 2013. This Guidance is designed to help storage vessel owners and operators comply with these rules.

The relevant definitions from Subpart OOOO are reproduced below in Section II of this Guidance. Sections III and IV are designed to help you determine if your storage vessel is subject to Subpart OOOO. While these sections are intended to explain the theoretical steps for determining whether your storage vessel is subject to Subpart OOOO, the actual calculation methods involve field work and technical assistance, whether performed in-house or through hired consultants. The applicability determination based on date of construction, modification or reconstruction discussed in Section III **must be completed by October 15, 2013**. The applicability determination based on storage vessel emissions discussed in Section IV **must be completed by October 15, 2013 for Group 1 storage vessels** and by April 15, 2014 or 30 days after startup, whichever is less, for Group 2 storage vessels. It is very important to understand that an operator has the option of accepting a “legally and practically enforceable limit” in an operating permit or other requirement established under a Federal, State, local or tribal authority in order to **keep emissions of volatile organic compounds (“VOCs”) below the 6 tons per year (“TPY”) applicability threshold and thereby avoid Subpart OOOO coverage**. This is discussed further in Section IV. Section V of this Guidance summarizes the emission reduction requirements for storage vessel affected facilities under Subpart OOOO. Section VI discusses the annual reporting requirements as well as the recordkeeping requirements of Subpart OOOO. Section VII describes generally the performance testing and compliance monitoring requirements for control devices. Importantly, these compliance monitoring requirements are still being reviewed by EPA and may undergo further revision in 2014, so they are not discussed in as much detail in this Guidance. Section VIII discusses the requirements associated with removing and placing storage vessel affected facilities from or into service, as well as how a storage vessel can cease to become an affected facility.

This Guidance quotes liberally from the regulatory language, with additional explanation where necessary. Additionally, Subpart OOOO contains many internal cross-references to other sections of the regulations. To help you understand those cross-references, information about the cross-reference is provided in brackets immediately following the citation. **This Guidance is intended to help owners and operators understand the requirements established by Subpart OOOO, but it cannot serve as a substitute for reviewing and referring to the regulations themselves for final determinations of applicability and requirements. Nothing in this Guidance should be construed as legal advice and is provided as a benefit of IPAA membership.**

¹ 78 Fed. Reg. 58416 (Sept. 23, 2013).

II. RELEVANT DEFINITIONS

The following relevant terms are defined at 40 C.F.R. § 60.5430.

Completion combustion device² means any ignition device, installed horizontally or vertically, used in exploration and production operations to combust otherwise vented emissions from completions.

Condensate means hydrocarbon liquid separated from natural gas that condenses due to changes in the temperature, pressure, or both, and remains liquid at standard conditions.

Flare means a thermal oxidation system using an open (without enclosure) flame. Completion combustion devices as defined in this section are not considered flares.

Flow line means a pipeline used to transport oil and/or gas from the well to a processing facility, a mainline pipeline, re-injection, or routed to a process or other useful purpose.

Flowback means the process of allowing fluids to flow from a natural gas 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 flowback period begins when material introduced into the well during the treatment returns to the surface immediately following hydraulic fracturing or refracturing. The flowback period ends with either well shut in or when the well is producing continuously to the flow line or to a storage vessel for collection, whichever occurs first.

Gas well or natural gas well means an onshore well drilled principally for production of natural gas.

Group 1 storage vessel means a storage vessel, as defined in this section, for which construction, modification or reconstruction has commenced after August 23, 2011, and on or before April 12, 2013.

Group 2 storage vessel means a storage vessel, as defined in this section, for which construction, modification or reconstruction has commenced after April 12, 2013.

Hydraulic fracturing or refracturing means the process of directing pressurized fluids containing any combination of water, proppant, and any added chemicals to penetrate tight

² EPA has never fully defined “enclosed combustor.” In the original August 16, 2012 rule, enclosed combustors are described parenthetically as thermal or catalytic vapor incinerators. Despite inquiries from industry, EPA has not clarified what “ground flares” (flares enclosed with a shroud) are considered. Additionally, the phrases “enclosed combustor” and “combustion device” (which could include a traditional, open flare) are used interchangeably in the August 2, 2013 amendments. For purposes of Subpart OOOO, the differences are immaterial if EPA retains the “streamlined” compliance monitoring requirements discussed in Section VII, *infra*, for closed cover/vent/control systems for all combustion devices. However, if EPA reverts back to the full-fledged requirements from the August 16, 2012 rule, then it becomes significant because the requirements are more stringent for “enclosed combustors” as compared to traditional flares.

formations, such as shale or coal formations, that subsequently require high rate, extended flowback to expel fracture fluids and solids during completions.

Hydraulic refracturing means conducting a subsequent hydraulic fracturing operation at a well that has previously undergone a hydraulic fracturing operation.

Pressure vessel means a storage vessel that is used to store liquids or gases and is designed not to vent to the atmosphere as a result of compression of the vapor headspace in the pressure vessel during filling of the pressure vessel to its design capacity.

Process unit means 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.

Produced water means water that is extracted from the earth from an oil or natural gas production well, or that is separated from crude oil, condensate, or natural gas after extraction.

Responsible official means one of the following:

(1) For a corporation: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:

- (i) The facilities employ more than 250 persons or have gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars); or
- (ii) The delegation of authority to such representatives is approved in advance by the permitting authority;

(2) For a partnership or sole proprietorship: a general partner or the proprietor, respectively;

(3) For a municipality, State, Federal, or other public agency: Either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of EPA); or

(4) For affected facilities:

- (i) The designated representative in so far as actions, standards, requirements, or prohibitions under title IV of the Clean Air Act or the regulations promulgated thereunder are concerned; or
- (ii) The designated representative for any other purposes under part 60.

Routed to a process or route to a process means the emissions are conveyed via a closed vent system to any enclosed portion of a process unit where the emissions are predominantly recycled and/or consumed in the same manner as a material that fulfills the same function in the process and/or transformed by chemical reaction into materials that are not regulated materials and/or incorporated into a product; and/or recovered.

Storage vessel means a tank or other vessel that contains an accumulation of crude oil, condensate, intermediate hydrocarbon liquids, or produced water, and a unit that is constructed primarily of nonearthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provides structural support and is designed to contain an accumulation of liquids or other materials. For the purposes of this subpart, The following are not considered storage vessels:

- (1) 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.
- (2) Process vessels such as surge control vessels, bottoms receivers or knockout vessels.
- (3) Pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere.

Well means an oil or gas well, a hole drilled for the purpose of producing oil or gas, or a well into which fluids are injected.

Wellhead means the piping, casing, tubing and connected valves protruding above the earth's surface for an oil and/or natural gas well. The wellhead ends where the flow line connects to a wellhead valve. The wellhead does not include other equipment at the well site except for any conveyance through which gas is vented to the atmosphere.

III. DETERMINE IF YOU HAVE GROUP 1 OR GROUP 2 STORAGE VESSELS

The first step in determining whether you have to comply with the storage vessel requirements of Subpart OOOO involves determining if you have Group 1 or Group 2 “storage vessels.” For purposes of Subpart OOOO, a “storage vessel” is defined as “a tank or other vessel that contains an accumulation of crude oil, condensate, intermediate hydrocarbon liquids, or produced water, and a unit that is constructed primarily of non-earthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provides structural support and is designed to contain an accumulation of liquids or other materials.” 40 C.F.R. § 60.5430. Notably, the following **are not** considered “storage vessels”:

- (1) 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.
- (2) Process vessels such as surge control vessels, bottoms receivers or knockout vessels.
- (3) Pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere.

Id. The difference between Group 1 and Group 2 storage vessels is based on **when construction of the vessel “commenced”**:

Group 1 storage vessel means a storage vessel . . . for which construction, modification or reconstruction has commenced after August 23, 2011, and on or before April 12, 2013.

Group 2 storage vessel means a storage vessel . . . for which construction, modification or reconstruction has commenced after April 12, 2013.

Id. “Construction,” in turn, means “fabrication, erection, or installation of an affected facility” (i.e., the storage vessel). *Id.* § 60.2. “Commenced” means “that an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.” *Id.*

If construction of your storage vessel commenced prior to August 23, 2011, you do not have to comply with Subpart OOOO. As discussed, “construction” is not limited to the actual fabrication of the vessel—EPA will look to the earliest possible date that could constitute construction (most notably, entering into a contractual obligation to construct a vessel).

Notably, a vessel that was constructed prior to August 23, 2011 can become subject to Subpart OOOO if it is reconstructed or modified after August 23, 2011. The definition of modification requires both a physical change or change in the method of operation *and* an

emissions increase associated with that change. The emissions increase means an increase in the hourly emissions rate. Importantly, the regulations also discuss what does not constitute a modification. Routine maintenance, repair and replacement of equipment does not constitute a modification. 40 C.F.R. § 60.14(e)(1). Further, an increase in the production rate (presumably an increase in emissions) that can be accomplished without a capital expenditure is not considered a modification. *Id.* § 60.14(e)(2). Whether a storage vessel has undergone “reconstruction” is based on the cost of the work on the facility (i.e., the vessel) versus the cost to completely replace the vessel. If cost of the work exceeds 50% of the cost of a brand new storage vessel, then it will be considered to be “reconstructed” and Subpart OOOO could apply to the vessel.³ Although guidance and applicability determinations are available that address what constitutes “construction,” “modification,” and “reconstruction,” it is often less than self-evident at times whether an activity meets one of these definitions, and therefore any such determination should be made with input from experts familiar with the regulations and EPA guidance.

Again, this first step is to determine if you have a Group 1 or Group 2 storage vessel, as defined. The next step is to determine if your Group 1 or Group 2 storage vessel is an “affected facility” under Subpart OOOO.

IV. IF YOU HAVE A GROUP 1 OR GROUP 2 STORAGE VESSEL, IS IT A STORAGE VESSEL AFFECTED FACILITY?

Only those storage vessels that are “located in the production segment, natural gas processing segment or natural gas transmission and storage segment” **and** that have the **potential to emit (“PTE”) VOCs in an amount equal to or greater than 6 TPY** are subject to the requirements of Subpart OOOO. 40 C.F.R. § 60.5365(e). Owners and operators of Group 1 storage vessels must make a determination of coverage under Subpart OOOO by **October 15, 2013**. Owners and operators of Group 2 storage vessels must make this determination by April 15, 2014 or 30 days after startup, whichever is later.

Calculating the PTE for a storage vessel, in theory, is relatively straightforward. The annual PTE is based on the “maximum average daily throughput determined for a 30-day period of production prior to the applicable determination deadline” mentioned above. 40 C.F.R. § 60.5365(e).

³ “Reconstruction” is defined to mean the replacement of equipment and components to such an extent that the capital cost of the new or replaced equipment or components exceeds 50% of the cost of a new facility. *Id.* § 60.15. The term “modification” is also defined in the general provisions and “means any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant . . . emitted into the atmosphere by that facility or which results in the emission of any air pollutant . . . into the atmosphere not previously emitted. 40 C.F.R. § 60.2. These terms can come into play in a situation where a non-affected vessel is leaking and in need of repair, and the costs of repair trigger the definition of “reconstruction,” thereby bringing the vessel within the definition of a Group 1 or Group 2 vessel.

In practice, calculating a given storage vessel's PTE can be more complicated because (1) operators can take credit for limits contained in any legally and practically enforceable permit or requirement established under a Federal, State, or local authority; (2) practical limitations on the ability to estimate the emissions associated with the condensate/material in the vessel; and (3) provisions of Subpart OOOO that exclude certain vapors/emissions from the PTE calculation.

If a storage vessel is subject to an enforceable permit limit to restrict its VOC emissions below 6 TPY prior to the applicability determination deadline, then that vessel is not an "affected facility" for purposes of Subpart OOOO. *Id.* The permit need not be issued by the Federal government as long as it is "legally and practically enforceable." *Id.* In the preamble to the revisions to Subpart OOOO, EPA indicated its "ability to require Federal enforceability . . . has been an issue . . . [and] the agency does not feel at this time that it can dictate Federal enforceability in this context." 78 Fed. Reg. at 58424. This could represent a significant opportunity for operators to accept restrictions in state-issued permits to keep VOC emissions below 6 TPY and avoid having to comply with Subpart OOOO. The PTE also may be adjusted by considering an enforceable permit condition requiring Best Available Control Technology ("BACT") or other controls on the storage vessel emissions. Another example would be a limit on production in a state-issued permit, which would keep a storage vessel's annual VOC emissions below 6 TPY. More typically, the enforceable limit is translated into a requirement for a control device, such as an enclosed combustor, with a minimum required destruction efficiency. The limit is made practically enforceable through monitoring, recordkeeping and reporting requirements in the state-issued permit that are likely to be less onerous than the Subpart OOOO requirements. This may or may not be a feasible option for owners or operators, but, if so, it should be utilized in order to avoid NSPS requirements for a storage vessel. An operator may want to ask the relevant Federal, State, local or tribal authority if their particular requirements can be used for this purpose.

The second complication, particularly for the smaller, independent owner or operator, is that VOC "emissions must be calculated using a generally accepted model or calculation methodology." 40 C.F.R. § 60.5365(e). One acceptable calculation involves taking high pressure liquid samples and/or pressure/volume/temperature samples used in conjunction with a modeling program such as ProMax or E&P Tanks.⁴ EPA's response to comments document also lists process simulation software such as "HYSIM, HYSIS, WINSIM, PROSIM, as well as calculation methodologies such as the Vazquez-Beggs equation," which also appears to require direct sampling of the condensate/product. Many states do not allow or restrict the use of the Vazquez-Beggs equation and an operator should contact the relevant regulatory agency before using it, as there is a potential to underestimate emissions. Additionally, a few states have adopted state-specific protocols for calculating vessel emissions.⁵

⁴ Certain Provisions of New Source Performance Standards, Response to Public Comments on Proposed Rule (78 FR 22126; April 12, 2013) (July 2013) at page 24.

⁵ California: http://www.arb.ca.gov/cc/oil-gas/flash_test_procedure_apr24.pdf
Wyoming: <http://deq.state.wy.us/aqd/Oil%20and%20Gas/March%202010%20FINAL%20O&G%20GUIDANCE.pdf>

VOC emissions also depend on factors within the owner or operator’s control, such as the production equipment utilized. However, emissions are highly impacted by uncontrollable parameters such as ambient temperatures, pipeline pressures, or other downstream conditions. The process/production equipment impacts flash emissions when the condensate is first released into the storage vessel (e.g., the higher the pressure differential between the last separator and atmospheric storage vessel, the higher the volume of flash emissions). Varying fluid chemical composition from pad to pad also will affect VOC emissions. Estimating emissions from vessels storing condensate is complicated, involves sampling (which can be complicated) and process simulation that likely will necessitate hiring a consultant with specialized experience. Estimating emissions from vessels storing crude oil is less complicated, but still may require the assistance of a consultant.

The regulations also allow you to take credit, for purposes of determining PTE, for any emissions “that . . . [are] recovered and routed **to a process** through a VRU [vapor recovery unit] designed and operated as specified in the section . . . provided you comply with the requirements in paragraphs (e)(1) through (4) of this section.” 40 C.F.R. § 60.5365(e) (emphasis added). The requirements set forth in paragraphs (e)(1) through (4) are extensive. Generally, these subsections establish: (1) cover requirements for all openings; (2) requirements for closed vents (mainly, operational 95% of the time and sending the vapor to either a “control device or a process”); and (3) requirements for control devices. The relevant regulatory text is set forth in full below.

If you want to take credit under Subpart OOOO for captured VOC vapors, they must (a) be sent to a process through a vapor recovery unit;⁶ (b) which must be operated as required in the regulation; and (c) comply with 40 C.F.R. § 60.5365(e)(1)–(4), which state as follows:

- (e)(1) requires meeting the cover requirement of 60.5411(b);
- (e)(2) requires meeting the closed vent system requirement in 60.5411(c);

Texas:

http://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/guidance_flashemission.pdf

<http://www.tceq.texas.gov/assets/public/permitting/air/NewSourceReview/oilgas/produced-water.pdf>

⁶ While “vapor recovery unit” is not defined in Subpart OOOO, the Response to Comment document associated with the Storage Vessel Reconsideration Rulemaking provides some useful information:

Vapor recovery *devices* are control devices such as a carbon adsorber or a condenser. A vapor recovery *unit* is a piece of equipment, usually a compressor, that collects a gas stream and returns it to the process for a useful purpose, such as recovery, recycling or reuse. The 2012 NSPS final rule includes a definition of “routed to a process or route to a process” as including emissions that “are conveyed via a closed vent system to any enclosed portion of a process unit where the emissions are predominantly recycled and/or consumed in the same manner as a material that fulfills the same function in the process and/or transformed by chemical reaction into materials that are not regulated materials and/or incorporated into a product; and/or recovered.” Vapor recovery units and flow lines that would meet this definition would be considered part of the process and would not be considered control devices that are subject to the control requirements under the final amendments.

- (e)(3) requires you maintain records required in (e)(1) & (2) above; and
- (e)(4) if you remove the VRU or you don't comply with (e)(1) & (2) above, you must recalculate your PTE within 30 days.

A. Cover Requirements of 40 C.F.R. § 60.5411(b) are as follows:

- (1) The cover and all openings on the cover shall form a continuous barrier over the entire surface area of the liquid in the storage vessel or wet seal degassing system.
- (2) Each cover opening shall be secured in a closed, sealed position (gasket lid or cap) whenever material is in the unit except when it is necessary to use an opening as follows:
 - (i) To add material to or remove material from the unit (including openings necessary to equalize or balance the internal pressure of the unit following changes in the level of material in the unit);
 - (ii) To inspect or sample the material in the unit;
 - (iii) To inspect, maintain, repair, or replace equipment located in the unit, or
 - (iv) To vent liquids, gases or fumes from the unit through a closed-vent system designed and operated in accordance with paragraph (a) or (c) of section 60.5411 to a control device or to a process [(a) contains requirements for centrifugal compressor wet seal degassing systems and (c) are set for below].
- (3) Each storage vessel thief hatch shall be weighted and properly seated. You must select gasket material for the hatch based on composition of the fluid in the storage vessel and weather conditions.

B. Closed vent system requirements of 40 C.F.R. § 60. 5411(c) are as follows:

- (1) You must design the closed vent system to route all gases, vapors, and fumes emitted from the material in the storage vessel to a control device that meets the requirements specified in §60.5412(c) and (d) [*see below*], or to a process.
- (2) You must design and operate a closed vent system with no detectable emissions, as determined using olfactory, visual and auditory inspections. Each closed vent system that routes emissions to a process must be operational 95 percent of the year or greater.
- (3) You must meet the requirements specified in paragraphs (c)(3)(i) and (ii) [*see below*] of this section if the closed vent system contains one or more bypass devices that could be used to divert all or a portion of the gases, vapors, or fumes from entering the control device or to a process.
 - (i) Except as provided in paragraph (c)(3)(ii) of this section, you must comply with either paragraph (c)(3)(i)(A) or (B) of this section for each bypass device.
 - (A) You must properly install, calibrate, maintain, and operate a flow indicator at the inlet to the bypass device that could divert the stream away from the control device or process to the atmosphere that sounds an alarm, or, initiates notification via remote alarm to the nearest field office, when the bypass device is open such that the stream is being, or could be, diverted away from the control device or process to the atmosphere.
 - (B) You must secure the bypass device valve installed at the inlet to the bypass device in the non-diverting position using a car-seal or a lock-and-key type configuration.
 - (ii) Low leg drains, high point bleeds, analyzer vents, open-ended valves or lines, and safety devices are not subject to the requirements of paragraph (c)(3)(i) of this section.

C. Control devices must meet the following requirements in 40 C.F.R. § 60.5412(c) and (d):

- (c) For each carbon adsorption system used as a control device to meet the requirements of paragraph (a)(2) [controls for centrifugal compressors] or (d)(2) of this section [*see below*], you must manage the carbon in accordance with the requirements specified in paragraphs (c)(1) or (2) of this section.
- (1) Following the initial startup of the control device, you must replace all carbon in the control device with fresh carbon on a regular, predetermined time interval that is no longer than the carbon service life established according to § 60.5413(c)(2) or (3)⁷ or according to the design required in paragraph (d)(2) of this section, for the carbon adsorption system. You must maintain records identifying the schedule for replacement and records of each carbon replacement as required in § 60.5420(c)(10) and (12) [*see separate section on records*].
 - (2) You must either regenerate, reactivate, or burn the spent carbon removed from the carbon adsorption system in one of the units specified in paragraphs (c)(2)(i) through (vii) of this section.
 - (i) Regenerate or reactivate the spent carbon in a thermal treatment unit for which you have been issued a final permit under 40 CFR part 270 that implements the requirements of 40 CFR part 264, subpart X.
 - (ii) Regenerate or reactivate the spent carbon in a thermal treatment unit equipped with and operating air emission controls in accordance with this section.
 - (iii) Regenerate or reactivate the spent carbon in a thermal treatment unit equipped with and operating organic air emission controls in accordance with an emissions standard for VOC under another subpart in 40 CFR part 60 or this part.
 - (iv) Burn the spent carbon in a hazardous waste incinerator for which the owner or operator has been issued a final permit under 40 CFR part 270 that implements the requirements of 40 CFR part 264, subpart O.
 - (v) Burn the spent carbon in a hazardous waste incinerator which you have designed and operated in accordance with the requirements of 40 CFR part 265, subpart O.
 - (vi) Burn the spent carbon in a boiler or industrial furnace for which you have been issued a final permit under 40 CFR part 270 that implements the requirements of 40 CFR part 266, subpart H.
 - (vii) Burn the spent carbon in a boiler or industrial furnace that you have designed and operated in accordance with the interim status requirements of 40 CFR part 266, subpart H.
- (d) Each control device used to meet the emission reduction standard in §60.5395(d) [the 95%

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These sections state as follows:

- (2) For a regenerable carbon adsorption system, the design analysis shall include the vent stream composition, constituent concentrations, flowrate, relative humidity, and temperature, and shall establish the design exhaust vent stream organic compound concentration level, adsorption cycle time, number and capacity of carbon beds, type and working capacity of activated carbon used for the carbon beds, design total regeneration stream flow over the period of each complete carbon bed regeneration cycle, design carbon bed temperature after regeneration, design carbon bed regeneration time, and design service life of the carbon.
- (3) For a nonregenerable carbon adsorption system, such as a carbon canister, the design analysis shall include the vent stream composition, constituent concentrations, flowrate, relative humidity, and temperature, and shall establish the design exhaust vent stream organic compound concentration level, capacity of the carbon bed, type and working capacity of activated carbon used for the carbon bed, and design carbon replacement interval based on the total carbon working capacity of the control device and source operating schedule. In addition, these systems will incorporate dual carbon canisters in case of emission breakthrough occurring in one canister.

40 C.F.R. § 60.5413(c).

reduction requirement] for your storage vessel affected facility must be installed according to paragraphs (d)(1) through (3) of this section, as applicable. As an alternative, you may install a control device model tested under §60.5413(d) [establishing manufacturing performance testing for combustion control devices, which require less monitoring on the storage tank owner], which meets the criteria in §60.5413(d)(11) [performance test criteria] and §60.5413(e) [criteria for combustion control devices demonstrating continuous compliance].

- (1) Each enclosed combustion device (e.g., thermal vapor incinerator, catalytic vapor incinerator, boiler, or process heater) must be designed to reduce the mass content of VOC emissions by 95.0 percent or greater. You must follow the requirements in paragraphs (d)(1)(i) through (iii) of this section.
 - (i) Ensure that each enclosed combustion device is maintained in a leak free condition.
 - (ii) Install and operate a continuous burning pilot flame.
 - (iii) Operate the enclosed combustion device with no visible emissions, except for periods not to exceed a total of one minute during any 15 minute period. A visible emissions test using section 11 of EPA Method 22, 40 CFR part 60, appendix A, must be performed at least once every calendar month, separated by at least 15 days between each test. The observation period shall be 15 minutes. Devices failing the visible emissions test must follow manufacturer's repair instructions, if available, or best combustion engineering practice as outlined in the unit inspection and maintenance plan, to return the unit to compliant operation. All inspection, repair and maintenance activities for each unit must be recorded in a maintenance and repair log and must be available for inspection. Following return to operation from maintenance or repair activity, each device must pass a Method 22, 40 CFR part 60, appendix A, visual observation as described in this paragraph.
- (2) Each vapor recovery device (e.g., carbon adsorption system or condenser) or other non-destructive control device must be designed and operated to reduce the mass content of VOC in the gases vented to the device by 95.0 percent by weight or greater. A carbon replacement schedule must be included in the design of the carbon adsorption system.
- (3) You must operate each control device used to comply with this subpart at all times when gases, vapors, and fumes are vented from the storage vessel affected facility through the closed vent system to the control device. You may vent more than one affected facility to a control device used to comply with this subpart.

V. EMISSION REDUCTION REQUIREMENTS OF STORAGE VESSEL AFFECTED FACILITIES

If you determine that you have a storage vessel affected facility under Subpart OOOO, the rules establish two options for compliance:

- **Option 1** is to reduce VOC emissions by 95% via a control device that must meet all of the requirements discussed above. 40 C.F.R. § 60.5395(d)(1). Subpart OOOO establishes various compliance monitoring, recordkeeping and reporting requirements for the control device, which are discussed below.
- **Option 2** establishes an alternative mass-based emissions limit. Specifically, an owner or operator may remove control devices (installed to achieve the 95% reduction in VOC emissions discussed above) if emissions from the storage vessel have been below 4 TPY on an uncontrolled basis for 12 consecutive months. 40 C.F.R. § 60.5395(d)(2). The emissions must be calculated on a monthly basis

based on the average throughput for the month using a “generally accepted model or calculation methodology.” *Id.* However, a control device must be reinstalled under two scenarios: (1) if a well feeding the storage vessel undergoes fracturing or refracturing; or (2) the monthly emissions from the uncontrolled storage vessel increase to 4 TPY or greater. In the first instance, the control device must be in place as soon as liquids from the fractured/refractured well are routed to the storage vessel. In the second instance, the control device must be installed within 30 days of the monthly calculation showing an increase in emissions above 4 TPY.

VI. REPORTING REQUIREMENTS FOR STORAGE VESSEL AFFECTED FACILITIES

The reporting requirements for storage vessel affected facilities under Subpart OOOO are lengthy. Importantly, these requirements apply to storage vessels for which the PTE was calculated to be less than 6 TPY of VOCs as a result of capturing vapor and routing it to a process through a VRU. Such storage vessels are nevertheless considered affected facilities and must comply with the recordkeeping requirements established in 40 C.F.R. § 60.5420. 40 C.F.R. § 60.5365(e). Consequently, the ability to take credit for vapor capture is a benefit **only** if the vapor is routed **back to the process** (as opposed to a control device). If the vapor is routed to a control device, all the provisions of 40 C.F.R. § 60.5412(c) and (d) discussed above still apply.

A. Annual Reporting Requirements

Owners or operators of storage vessel affected facilities must submit annual reports that include the following general information:

- (i) The company name and address of the affected facility.
- (ii) An identification of each affected facility being included in the annual report.
- (iii) Beginning and ending dates of the reporting period.
- (iv) A certification by a responsible official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Id. § 60.5420(b)(1). The initial report is due 90 days after the close of the initial compliance period. *Id.* § 60.5420(b). The initial compliance period for Group 1 storage vessels concludes October 15, 2013 which means the initial report is due January 13, 2014. For Group 2 storage vessels, the initial compliance period “ends no later than one year after the initial startup date for your affected facility or no later than one year after October 15, 2012.” *Id.* § 60.5410. In addition to the general information above, Subpart OOOO establishes specific annual reporting requirements for storage vessel affected facilities, including:

- (i) An identification, including the location, of each storage vessel affected facility with VOC emissions greater than 6 tpy for which construction, modification or reconstruction commenced during the reporting period. The location of the storage vessel shall be in latitude and longitude coordinates in decimal degrees to an accuracy and precision of five (5) decimals of a degree using the North American Datum of 1983.
- (ii) Documentation of that the VOC emission rate determination according to is less than 6 tpy for meeting the requirements in § 60.5365(e).
- (iii) Records of deviations specified in paragraph (c)(5)(iii) [*see below for more record keeping requirements specific to storage vessels*] of this section that occurred during the reporting period.
- (iv) You must submit a notification identifying each Group 1 storage vessel affected facility in your initial annual report. You must include the location of the storage vessel, in latitude and longitude coordinates in decimal degrees to an accuracy and precision of five (5) decimals of a degree using the North American Datum of 1983.
- (v) A statement that you have met the requirements specified in § 60.5410(h)(2) [*indicating you calculated your PTE*] and (3) [*you reduced your emissions according to the regulations*].
- (vi) You must identify each storage vessel affected facility that is removed from service during the reporting period as specified in § 60.5395(f)(1).
- (vii) You must identify each storage vessel affected facility for which operation resumes during the reporting period as specified in § 60.5395(f)(2)(iii).

Id. § 60.5420(b)(6). Subsections 60.5420(b)(7) and (8) establish requirements for the owner/operator to report the results of performance tests conducted on the storage vessel control devices (whether they be site-specific performance tests or control device manufacturers' performance test results).⁸

⁸ Subpart OOOO establishes performance testing procedures for control devices under 40 C.F.R. § 60.5410. In addition to site-specific performance standards, the regulations contain requirements for manufacturers of combustion control devices that eliminate the need to conduct onsite performance tests of the control devices and reduce certain inspection and monitoring requirements.

B. Recordkeeping Requirements⁹

Section 60.5420(c) requires the retention of various records onsite or at the nearest local field house for at least 5 years. The recordkeeping requirements specific to storage vessel affected facilities are as follows:

- (i) If required to reduce emissions by complying with § 60.5395(d)(1) [*reduce emissions by 95%*], the records specified in §§ 60.5420(c)(6) through (c)(8) [*inspections of closed vent systems, covers, or subject to bypass requirements*], § 60.5416(c)(6)(ii) [*“unsafe to inspect” requirements*], and § 60.6516(c)(7)(ii) [*“difficult to inspect” requirements*] of this subpart.
- (ii) Records of the each VOC emissions determination for each that the VOC emission rate is less than 6 tpy per storage vessel affected facility made under §60.5365(e), including identification of the model or calculation methodology used to calculate the VOC emission rate.
- (iii) Records of deviations in cases where the storage vessel was not operated in compliance with the requirements specified in §§ 60.5395 [*standards applicable to storage vessel affected facilities*], 60.5411 [*requirements for covers and closed vents*], 60.5412 [*requirements for control devices*], and 60.5413 [*performance testing procedures*], as applicable.
- (iv) For storage vessels that are skid-mounted or permanently attached to something that is mobile (such as trucks, railcars, barges or ships), records indicating the number of consecutive days that the vessel is located at a site in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment. If a storage vessel is removed from a site and, within 30 days, is either returned to or replaced by another storage vessel at the site to serve the same or similar function, then the entire period since the original storage vessel was first located at the site, including the days when the storage vessel was removed, will be added to the count towards the number of consecutive days.

Id. § 60.5420(c)(5). The regulations also require retention of records associated with carbon replacement for carbon absorbers installed on storage vessel affected facilities, *id.* § 60.5420(c)(12), and records associated with control devices.¹⁰

⁹ In addition to the specific recordkeeping requirements established in Subpart OOOO, owners of affected facilities are generally responsible for the recording keeping requirements established in 40 C.F.R. § 60.7(f) related to continuous monitoring systems measurements, calibrations, test measurements, etc.

¹⁰ “For each storage vessel affected facility subject to the control device requirements of §60.5412(c) and (d), you must maintain records of the inspections, including any corrective actions taken, the manufacturers’ operating instructions, procedures and maintenance schedule as specified in

VII. PERFORMANCE TESTING AND COMPLIANCE MONITORING FOR CONTROL DEVICES

Because the control devices required to reduce VOC emissions by 95% are central to the effectiveness of Subpart OOOO, EPA promulgated specific performance testing requirements (40 C.F.R. § 60.5413) and compliance monitoring requirements (40 C.F.R. § 60.5417(h)) for these devices. This Guidance does not cover the compliance monitoring for control devices in as much detail as the cover and closed vent requirements, or the reporting and recordkeeping requirements discussed above, in part because it is unclear whether the current requirements will survive an ongoing litigation challenging to NSPS Subpart OOOO and associated reconsideration by EPA without further amendment. The original rule finalized on August 16, 2012 required a continuous parametric monitoring system (“CPMS”) for storage vessels. The April 12, 2013 amendments established the “streamlined” monitoring requirements discussed below, but EPA stated that the agency is still considering whether to reinstate the more detailed and complicated CPMS requirement. EPA intends to propose the final compliance monitoring requirements in December 2013 and finalize the requirements by the end of 2014.

A. Performance Testing

The specific performance testing requirements for control devices are found at 40 C.F.R. § 60.5413. The regulations set forth specific test methods and procedures for field testing, but also establish standards and procedures that manufacturers of control devices can conduct that will relieve the owner/operator of such requirements if it selects those control devices. 40 C.F.R. § 60.5413(d).

B. Compliance Monitoring

In general, the continuous compliance monitoring requirements for storage vessel control devices are set forth in 40 C.F.R. § 60.5417(h). The requirements include the following monthly inspections:

- Inspect of the pilot flame (which the control device must have, as opposed to electronic ignition devices).
- Inspect for visible emissions from the combustion device pursuant to section 11 of the EPA Method 22 (15 minute observation period, with no visible emissions, “except for periods not to exceed a total of 1 minute during any 15 minute period”).

§60.5417(h). You must maintain records of EPA Method 22, 40 CFR part 60, appendix A, section 11 results, which include: company, location, company representative (name of the person performing the observation), sky conditions, process unit (type of control device), clock start time, observation period duration (in minutes and seconds), accumulated emission time (in minutes and seconds), and clock end time. You may create your own form including the above information or use Figure 22-1 in EPA Method 22, 40 CFR part 60, appendix A. Manufacturer’s operating instructions, procedures and maintenance schedule must be available for inspection.” 40 C.F.R. § 60.5420(c)(13).

- Conduct an olfactory, visual, and auditory inspection of all equipment associated with the combustion control device.

40 C.F.R. § 60.5417(h)(1)(i)-(iii). The regulations also require certain actions in the absence of a pilot flame or other improper equipment operation.

For locations with combustion control devices tested by the manufacturer, a Method 22 visible emissions test must be conducted, but the compliance monitoring requirements are different in terms of the frequency (quarterly versus monthly) and the observation period (one hour versus 15 minutes). For control devices that fail the visible emissions test, the owner or operator must follow the manufacturer's repair instructions or "best combustion engineering practice outlined in the *unit inspection and maintenance plan*, to return the unit to compliant operation" if no repair instructions are available.¹¹ Upon return to service from maintenance or repair, a Method 22 visible emission test must be conducted. Although the owner/operator does not need to conduct the field performance test if a device tested by the manufacturer is utilized, an electronic copy of the performance test results from the manufacturer must be submitted to EPA unless the results for that device are posted at: www.epa.gov/airquality/oilandgas/. 40 C.F.R. § 60.5413(e).

VIII. REQUIREMENTS ASSOCIATED WITH REMOVING OR PLACING STORAGE VESSEL AFFECTED FACILITIES INTO SERVICE

Subpart OOOO establishes reporting requirements for storage vessels that are taken out of service and for storage vessels that are returned to service. For storage vessels taken out of service, a notification of such removal from service must be made in the next annual report. The requirements for returning a vessel to service also require notification in the next annual report, but include additional requirements based on whether the return to service is associated with a well fracture or refracture. If associated with a well fracture or refracture, the 95% reduction in VOC emissions must be met immediately upon return to service. If the vessel's return to service is not associated with a well fracture or refracture, the owner/operator has 30 days to determine if the vessel's emissions are greater than 4 TPY, and if so, the owner/operator must have controls in place within 60 days of returning to service. 40 C.F.R. § 60.5395(f). The practical effect of these regulations is that owners/operators need to track the location and use of storage vessels to avoid violating Subpart OOOO.

An issue related to taking vessels in and out of service is whether a "storage vessel affected facility" can ever lose its "status" as an affected facility. EPA addressed this issue in the Preamble and Response to Comments document associated with the April 2013 amendments. Essentially, the only way a storage vessel can no longer be considered an "affected facility" is if the vessel is no longer used to store crude oil, condensate, hydrocarbon intermediates or produced water. As long as the storage vessel is used to store any of these substances, the storage vessel will remain an affected facility and be subject to all of the requirements of Subpart

¹¹ 40 C.F.R. § 60.5413(e)(4) (emphasis added). It is unclear what is meant by the "unit inspection and maintenance plan.

OOOO.¹² The addition of the requirements found in 40 C.F.R. § 60.5395(f) effectively creates tracking requirements for all storage vessel affected facilities.

IX. CONCLUSION

The storage vessel regulations contained in Subpart OOOO are complicated. Certain regulatory determinations for Group 1 storage vessels must be made by October 15, 2013. Owners and operators of Group 2 storage vessels must make their emissions determinations within 30 days of startup or April 15, 2014 (whichever is later). The ability to accept an emission limit or restriction in a state-issued permit to keep VOC emissions below 6 TPY—and thus avoiding Subpart OOOO applicability—may be the best option for certain owners and operators. As indicated above, the compliance monitoring requirements are likely be revised in some manner by the end of 2014. Questions regarding this guidance can be directed to Matt Kellogg at 202.857.4722.

¹² Oil and Natural Gas Sector: Reconsideration of Certain Provisions of New Source Performance Standards, Section V(C)(2)(c). Oil and Natural Gas Sector: Certain Provisions of New Source Performance Standards, Response to Public Comments on Proposed Rule (78 Fed. Reg. 22126; April 12, 2013) (July 2013) at page 11.