



U.S. Environmental Protection Agency Applicability Determination Index

Control Number: Z050007

Category: NESHAP
EPA Office: Region 5
Date: 01/21/2005
Title: Alternative Monitoring of Pressure/Vacuum Relief Valves
Recipient: Ken Comey
Author: George Czerniak
Comments:

Subparts: Part 61, FF, Benzene Waste Operations
Part 61, V, Equipment Leaks/Fugitive Emission Sources

References: 61.347
61.343
61.343(a)(1)

Abstract:

Q: Does EPA approve an alternative monitoring plan, under 40 CFR part 61, subparts V and FF, for pressure/vacuum relief valves in the wastewater treatment plant tanks and oil-water separator located at Flint Hills Resources' (FHR) petroleum refinery in Rosemount, Minnesota?

A: Yes. EPA concludes that the pressure/vacuum relief valves function as both pressure relief devices and dilution air openings under NESHAP subparts V and FF. EPA did not promulgate a definition of "dilution air opening" in NESHAP subpart FF. NESHAP subpart V infers that a pressure relief device is designed to release pressure but is not designed to function as a dilution air opening. Since the pressure/vacuum relief valves relieve excess pressure in the closed vent system and allow dilution air to enter the closed vent system, the pressure/vacuum relief valves are both pressure relief devices and dilution air openings. EPA recognizes that the requirements of 40 CFR 61.343(a)(1)(i)(B) and (C) do not account for this dichotomy, and thus approves FHR's request for an alternative monitoring plan to resolve the ambiguity.

Letter:

01/21/2005

Ken Comey
Senior Air Compliance Manager
Flints Hills Resources, LP
P.O. Box 64596
St. Paul, Minnesota 55164-0596

RE: Request for Approval of Alternative Monitoring Plan to Meet Requirements of 40 CFR
Sec. 61.343(a)(1)(i)(C)(3) and Sec. 61.347(a)(1)(i)(C)(3)

Dear Mr. Comey:

On January 27, 2004, Flint Hills Resources, LP (FHR), requested a clarification of a February 16, 2000, applicability determination pertaining to the National Emission Standards for Benzene Waste Operations, 40 CFR 61, Subpart FF, Secs. 61.340 through 61.359, (hereinafter, the Benzene Waste NESHAP) at FHR's petroleum refinery located in Rosemount, Minnesota. This letter revises the February 2000 determination.

On December 29, 1999, FHR stated that it planned to replace the dilution air openings in three pieces of equipment with pressure/vacuum relief valves and asked the United States Environmental Protection Agency (U.S. EPA) to determine whether a pressure/vacuum relief valve is a dilution air opening or a pressure relief device. For the reasons stated below, U.S. EPA concludes that the pressure/vacuum relief valves function as both pressure relief devices and dilution air openings; recognizes that the requirements of 40 CFR Sec. 61.343(a)(1)(i)(B) and (C) do not account for this dichotomy; and approves FHR's request for an alternative monitoring plan to resolve the conflicting requirements.

FHR's Request

FHR's wastewater treatment plant (WWTP) includes Sludge Storage Tank 94V-26, Oil/Water Separator 94V-25F, Reclaimed Oil Sump 94S-10, and the WWTP Area Drain Sump in the sludge dewatering building (WWTP Area Drain Sump; no equipment number). The Sludge Storage Tank, Reclaimed Oil Sump and WWTP Area Drain Sump are subject to the provisions of 40 CFR Sec. 61.343, and the Oil/Water Separator is subject to the provisions of 40 CFR Sec. 61.347. Vapors from the Sumps, Tank and Oil/Water Separator move through a closed vent system to one of two thermal oxidizers. FHR designed the closed vent system and control device to pull dilution air through dilution air openings to keep the concentration of volatile organic compounds (VOC) in the system below the lower explosive limit (LEL). On December 29, 1999, FHR stated that it was in the process of re-balancing and improving the air flows from various tanks in the WWTP and that it has been difficult to maintain a vacuum at all points in this system.

Consequently, FHR decided to seal the dilution air openings on all but four pieces of equipment. FHR retained the dilution air opening on the Sludge Storage Tank and continues to operate and maintain a pressure monitor in this segment of the closed vent system. FHR stated that it planned to replace the dilution air openings on the Reclaimed Oil Sump, WWTP Area Drain Sump and Oil/Water Separator with pressure/vacuum relief valves. Each valve has a vacuum pallet and a pressure pallet. The vacuum pallet opens only under a negative pressure of

0.5 inch water column, and the pressure pallet opens only under a positive pressure of 2.0 inch water column. FHR asked U.S. EPA to determine whether a pressure/vacuum relief valve is a dilution air opening. In its request, FHR included a diagram of a pressure/vacuum relief valve and a piping and instrumentation diagram of the WWTP.

Discussion

1. Dilution Air Opening or Pressure Relief Device

FHR correctly notes that U.S. EPA did not promulgate a definition of "dilution air opening" in the Benzene Waste NESHAP. Although the undersigned does not have the authority to promulgate a definition, we believe that this term refers to any opening through which air can enter a closed vent system for the purpose of diluting the concentration of VOC below the LEL of the VOCs. We believe that 40 CFR Sec. 61.343(a)(1)(i)(A and B) require a dilution air opening to reseal when the concentration is below the LEL.

Even though the Benzene Waste NESHAP does not include a definition of "pressure relief device," the National Emission Standard for Equipment Leaks (Fugitive Emission Sources, 40 CFR 61, Subpart V, Secs. 61.240 through 61.247, includes the following definition:

Pressure release means the emission of materials resulting from the system pressure being greater than the set pressure of the pressure relief device.

We infer from this definition that a pressure relief device is designed to release pressure but is not designed to function as a dilution air opening. Because the pressure/vacuum relief valves relieve excess pressure in the closed vent system and allow dilution air to enter the closed vent system, we conclude that the pressure/vacuum relief valves are both pressure relief devices and dilution air openings. However, we recognize that the requirements of 40 CFR Sec. 61.343(a)(1)(i)(B) and (C) do not account for this dichotomy and that some of their requirements are not appropriate.

2. Request for an Alternative Monitoring Plan

40 CFR Sec. 61.343(a)(1) sets forth requirements for the owner or operator of a tank to install, operate, and maintain a fixed roof and a closed vent system that is connected to a control device. 40 CFR Sec. 61.343(a)(1)(i) sets forth:

(A) The cover and all openings (e.g., access hatches, sampling ports, and gauge wells) shall be designed to operate with no detectable emissions as indicated by an instrument reading of less than 500 ppmv above background, as determined initially and thereafter at least once per year by the methods specified in [40 CFR Sec. 61.355(h)].

(B) Each opening shall be maintained in a closed, sealed position (e.g., covered by a lid that is gasketed and latched) at all times that waste is in the tank except when it is necessary to use the opening for waste

sampling or removal, or for equipment inspection, maintenance, or repair.

(C) If the cover and closed-vent system operate such that the tank is maintained at a pressure less than atmospheric pressure, then paragraph (a)(1)(i)(B) of this section does not apply to any opening that meets all of the following conditions:

(1) The purpose of the opening is to provide dilution air to reduce the explosion hazard;

(2) The opening is designed to operate with no detectable emissions as indicated by an instrument reading of less than 500 ppmv above background, as determined initially and thereafter at least once per year by the methods specified in Sec.

61.355(h); and

(3) The pressure is monitored continuously to ensure that the pressure in the tank remains below atmospheric pressure.

40 CFR Sec. 61.347(a)(1)(i)(A, B, and C) set forth identical requirements for the owner or operator of an oil/water separator.

The pressure/vacuum relief valve's dichotomy does not create a conflict for the requirement in 40 CFR Sec. 61.343(a)(1)(i)(A) or Sec. 61.347(a)(1)(i)(A). FHR does not open the pressure/vacuum relief valves to sample or remove waste or to inspect, maintain, or repair the fixed roof tank itself. Therefore, 40 CFR Sec. 61.343(a)(1)(i)(B) or Sec. 61.347(a)(1)(i)(B) does not create a conflict until a pressure/vacuum relief valve's pressure pallet opens to relieve excess pressure. At such times, the pressure in the closed vent system is greater than atmospheric pressure, and the continuous pressure monitoring requirement in 40 CFR Sec. 61.343(a)(1)(i)(C)(3) or Sec. 61.347(a)(1)(i)(C) is moot.

FHR proposed the following alternative monitoring plan to address this conflict:

1. Design of the pressure/vacuum relief valves: The vacuum pallet opens only under a negative pressure of 0.5 inch water column, and the pressure pallet opens only under a positive pressure of 2.0 inch water column.
2. Periodic inspections: FHR will inspect all of the pressure/ vacuum relief valves quarterly to verify proper operation.
3. Periodic monitoring: FHR will conduct semiannual monitoring with the test method specified in 40 CFR Sec. 61.355(h).

U.S. EPA believes that the pressure/vacuum relief valves were designed to ensure that the valves remain in a closed, sealed position unless the vacuum pallet is open to serve as a dilution air opening or the pressure pallet is open to relieve excess pressure. Further, we believe that quarterly inspections and semiannual monitoring are consistent with the purposes of 40 CFR Secs. 61.343(a)(1)(i) and 61.347(a)(1)(i). FHR's request did not specify an instrument reading that indicates detectable emissions from the pressure/vacuum relief valve. Therefore, U.S. EPA specifies that an instrument reading above 500 ppm above background indicates detectable

emissions from the pressure/ vacuum relief valve. With this clarification, the Administrator of the U.S. EPA, by authority duly-delegated to the undersigned, approves FHR's alternative monitoring plan request.

If you have any questions regarding this letter, please contact Charles Hall, of my staff, at (312) 353-3443.

Sincerely,

George Czerniak, Chief
Air Enforcement and Compliance Assurance Branch

cc: Scott Parr, Minnesota Pollution Control Agency