

**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Part 63**

[OAR-2002-0033; AD-FRL-7969-9]

RIN 2060-AK51

**National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units**

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Direct final rule; amendments.

**SUMMARY:** On April 11, 2002, pursuant to section 112 of the Clean Air Act (CAA), the EPA issued national emission standards to control hazardous air pollutants emitted from catalytic cracking units, catalytic reforming units, and sulfur recovery units at petroleum refineries. This action promulgates amendments to several sections of the existing standards. The amendments will change the affected source designations and add new compliance options for catalytic reforming units that use different types of emission control systems, new monitoring alternatives for catalytic cracking units and catalytic reforming units, and a new procedure for determining the metal or total chloride concentration on catalyst particles. The amendments will also defer technical requirements for most continuous parameter monitoring systems, clarify testing and monitoring requirements, and make editorial corrections.

**DATES:** The final amendments will be effective on April 11, 2005, unless we receive significant adverse comments by March 11, 2005, or by March 28, 2005 if a public hearing is requested. If such comments are received, we will publish a timely withdrawal in the **Federal Register** indicating which amendments, paragraph, or section will become effective and which amendments, paragraph, or section are being withdrawn due to adverse comment. Any distinct amendment, paragraph, or section of the direct final amendments for which we do not receive adverse

comment will become effective on April 11, 2005.

**ADDRESSES:** *Comments.* Submit your comments, identified by Docket ID No. OAR-2002-0033, by one of the following methods:

- Federal eRulemaking Portal: <http://www.regulations.gov>. Follow the on-line instructions for submitting comments.
- Agency Web site: <http://www.epa.gov/edocket>. EDOCKET, EPA's electronic public docket and comment system, is EPA's preferred method for receiving comments. Follow the on-line instructions for submitting comments.

- E-mail: [a-and-r-docket@epa.gov](mailto:a-and-r-docket@epa.gov).
- Fax: (202) 566-1741.
- Mail: National Emission Standards for Hazardous Air Pollutants (NESHAP) for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units Docket, Environmental Protection Agency, Mailcode: 6102T, 1200 Pennsylvania Ave., NW., Washington, DC 20460. Please include a total of two copies.

- *Hand Delivery:* Environmental Protection Agency, 1301 Constitution Avenue, NW., Room B102, Washington, DC 20460. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

*Instructions:* Direct your comments to Docket ID No. OAR-2002-0033. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at <http://www.epa.gov/edocket>, including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through EDOCKET, [regulations.gov](http://www.regulations.gov), or e-mail. The EPA EDOCKET and the Federal [regulations.gov](http://www.regulations.gov) Web sites are "anonymous access" systems, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly

to EPA without going through EDOCKET or [regulations.gov](http://www.regulations.gov), your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

*Docket:* All documents in the docket are listed in the EDOCKET index at <http://www.epa.gov/edocket>. Although listed in the index, some information is not publicly available, i.e., CBI or other information whose disclosure is restricted by statute. Certain other information, such as copyrighted materials, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically in EDOCKET or in hard copy form in Docket ID No. OAR-2002-0033 (or A-97-36), EPA/DC, EPA West, Room B102, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air Docket is (202) 566-1742.

**FOR FURTHER INFORMATION CONTACT:** Mr. Robert B. Lucas, Emission Standards Division (C439-03), Office of Air Quality Planning and Standards, Environmental Protection Agency, Research Triangle Park, NC 27711, telephone number (919) 541-0884, fax number (919) 541-3470, e-mail address: [lucas.bob@epa.gov](mailto:lucas.bob@epa.gov).

**SUPPLEMENTARY INFORMATION:** *Regulated Entities.* Categories and entities potentially regulated by this action include:

Category	NAICS code <sup>1</sup>	Examples of regulated entities
Industry .....	32411	Petroleum refineries that operate catalytic cracking units, catalytic reforming units, or sulfur recovery units.
Federal government .....	.....	Not affected.
State/local/tribal government .....	.....	Not affected.

<sup>1</sup> North American Industry Classification System.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. To determine whether your facility is regulated by this action, you should examine the applicability criteria in 40 CFR 63.1561 of the NESHAP for petroleum refineries: Catalytic cracking units, catalytic reforming units, and sulfur recovery units. If you have questions regarding the applicability of this action to a particular entity, consult the contact person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

**Worldwide Web (WWW).** In addition to being available in the docket, an electronic copy of today's direct final rule amendments will also be available on the Worldwide Web (WWW) through the Technology Transfer Network (TTN). Following the Administrator's signature, a copy of the direct final rule amendments will be placed on the TTN's policy and guidance page for newly proposed or promulgated rules at <http://www.epa.gov/ttn/oarpg>. The TTN provides information and technology exchange in various areas of air pollution control. If more information regarding the TTN is needed, call the TTN HELP line at (919) 541-5384.

**Judicial Review.** Under section 307(b)(1) of the CAA, judicial review of the direct final amendments is available only by filing a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit by April 11, 2005. Under section 307(d)(7)(B) of the CAA, only an objection to the final amendments that was raised with reasonable specificity during the period for public comment can be raised during judicial review. Moreover, under section 307(b)(2) of the CAA, the requirements established by the final amendments may not be challenged separately in any civil or criminal proceedings brought by the EPA to enforce these requirements.

**Comments.** We are publishing the amendments as a direct final rule without prior proposal because we view the amendments as noncontroversial and do not anticipate adverse comments. However, in the Proposed Rules section of this **Federal Register**, we are publishing a separate document that will serve as the proposal for the amendments contained in this direct final rule in the event that significant adverse comments are filed. If we receive any significant adverse comments on one or more distinct amendments, we will publish a timely withdrawal in the **Federal Register** informing the public which provisions will become effective and which provisions are being withdrawn due to adverse comment. We will address all

public comments in a subsequent final rule based on the proposed rule. We will not institute a second comment period on this direct final rule. Any parties interested in commenting must do so at this time.

**Outline.** The information presented in this preamble is organized as follows:

- I. Background
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  - B. How are we changing the testing and monitoring requirements for catalytic cracking units?
  - C. What new procedure is available for determining the metal or total chloride concentration on catalyst particles?
  - D. What new alternative is available for calculating the volumetric flow rate of exhaust gases from catalytic cracking units?
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  - B. Paperwork Reduction Act
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  - D. Unfunded Mandates Reform Act
  - E. Executive Order 13132: Federalism
  - F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments
  - G. Executive Order 13045: Protection of Children From Environmental Health & Safety Risks
  - H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use
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  - J. Congressional Review Act

## I. Background

On April 11, 2002 (67 FR 17762), we issued the national emission standards for hazardous air pollutants (NESHAP) for catalytic cracking units (CCU), catalytic reforming units (CRU), and sulfur recovery units (SRU) at petroleum refineries (40 CFR part 63, subpart UUU). The NESHAP establish emissions

limits for hazardous air pollutants (HAP) emitted from vents on the three types of process units, as well as work practice standards for by-pass lines. The NESHAP implement section 112(d) of the CAA by requiring all petroleum refineries that are major sources to meet standards reflecting the application of the maximum achievable control technology (MACT).

After publication of the NESHAP, two industry trade associations and various individual refineries raised issues and questions regarding the applicability of the NESHAP and the technical requirements for installation, operation, and maintenance of continuous parameter monitoring systems (CPMS). The industry representatives and a control technology manufacturer also requested that we clarify the requirements for CRU depressurizing and purging, add more compliance provisions for CRU with internal scrubbing systems, and include new provisions for CRU that use emission control technologies other than scrubbers. The industry representatives also requested clarification of various performance testing and monitoring provisions. Other questions were raised at an implementation workshop held in January 2003. Today's direct final rule amendments respond to the issues raised since promulgation and will reduce compliance uncertainties, encourage the use of new control technologies, and improve understanding of the NESHAP requirements.

In addition, since publication of the NESHAP, we have identified a number of minor technical and editorial errors requiring correction. Rather than publish a separate notice of corrections, we are including those changes along with the amendments.

## II. Summary of the Direct Final Rule Amendments

### A. How Are We Changing the Affected Source Designations?

One of the issues raised by the industry representatives concerns the language in 40 CFR 63.1562 where we identified the affected sources as each CCU that regenerates catalyst, each CRU that regenerates catalyst, and each SRU and the tail gas treatment unit serving it. In designating the affected source as the unit rather than the vent or group of vents on the unit (as originally proposed), we inadvertently made the NESHAP more stringent for some facilities, and these facilities did not have an opportunity to comment on the change. Therefore, we are revising the designation of affected sources to be

more consistent with the rule as proposed. The direct final rule amendments define the process unit affected sources as:

- The process vent or group of process vents on fluidized CCU units that is associated with regeneration of the catalyst used in the unit (*i.e.*, the catalyst regeneration flue gas vent).
- The process vent or group of process vents on CRU (including but not limited to semi-regenerative, cyclic, or continuous processes), that is associated with regeneration of the catalyst used in the unit. This affected source includes vents that are used during the unit depressurization, purging, coke burn, and catalyst rejuvenation.
- The process vent or group of process vents on Claus or other types of sulfur recovery plant units or the tail gas treatment units serving sulfur recovery plants that is associated with sulfur recovery.

#### *B. How Are We Changing the Testing and Monitoring Requirements for Catalytic Cracking Units?*

The initial compliance provisions in 40 CFR 63.1564(b)(1) require the owner or operator to install, operate, and maintain a CPMS according to the requirements in 40 CFR 63.1572 and Table 3 to subpart UUU. Facilities that are not subject to the new source performance standards (NSPS) for petroleum refineries and that elect to meet the particulate matter (PM) or nickel (Ni) limit in the NESHAP are required to monitor the gas flow rate to a wet scrubber. After promulgation, industry representatives recommended that we revise the CCU monitoring requirements to allow gas flow rate measurements before or after the control device. The direct final rule amendments revise the requirements in Table 3 to subpart UUU to allow measurement of the gas flow rate entering or exiting the control device. This change will improve implementation of the NESHAP and avoid unnecessary costs of changing current practices. The direct final rule amendments also revise the footnotes to Tables 3 and 7 to subpart UUU to change the citation for the alternative method for determining gas flow rate from 40 CFR 63.1573(a) to 40 CFR 63.1573(a)(1) to accommodate the new alternative for calculating the volumetric flow rate of exhaust gases when computing the PM emissions rate.

The initial compliance provisions in 40 CFR 63.1564(b)(2) require the owner or operator to conduct a performance test for certain CCU according to the requirements in Table 4 to subpart UUU. After promulgation, industry

representatives recommended that we delete the sampling rate requirements cited for EPA Method 29 (40 CFR part 60, appendix A). According to the commenters, the sampling rate requirement is unnecessary because the method already includes appropriate sampling requirements. We agree and have deleted the 0.028 dry standard cubic meters per minute (dscm/min)/0.74 dry standard cubic feet per minute (dscf/min) sampling rate requirement from Table 4 to subpart UUU.

#### *C. What New Procedure Is Available for Determining the Metal or Total Chloride Concentration on Catalyst Particles?*

The owner or operator of a CCU subject to a Ni limit for inorganic HAP emissions must determine the equilibrium catalyst (E-cat) Ni concentration value during the initial performance test and at frequent intervals afterward for monitoring requirements. Several methods are currently used within the industry for this purpose and are referenced in the NESHAP, as well as any alternative method satisfactory to the Administrator. Industry experts and vendors recommended that the NESHAP allow a new procedure that was not fully developed at the time the NESHAP were promulgated. The direct final rule amendments add the new procedure, "Determination of Metal Concentration on Catalyst Particles (Instrumental Analyzer Procedure)" to appendix A of subpart UUU. This procedure can be used to analyze catalyst particles (Ni compounds and total chlorides) from CCU, CRU, and other processes specified within EPA regulations. The direct final rule amendments revise Table 4 to subpart UUU to reference the new procedure.

#### *D. What New Alternative is Available for Calculating the Volumetric Flow Rate of Exhaust Gases From Catalytic Cracking Units?*

The initial compliance provisions in 40 CFR 63.1564(b)(4) require the owner or operator of a CCU subject to the PM limit in the NSPS for petroleum refineries to compute the PM emission rate using Equation 1 of 40 CFR 63.1564. This calculation requires measurement of the volumetric flow rate of exhaust gas from the catalyst regenerator ("Q<sub>r</sub>"). The direct final rule amendments revise the definition of "Q<sub>r</sub>" to refer to a new alternative procedure in 40 CFR 63.1573(a)(2) that can be used to determine the volumetric flow rate of exhaust gas. This procedure can be used by plants that have a gas analyzer installed in the catalytic cracking regenerator exhaust vent prior to the

addition of air or other gas streams. The new alternative allows measurement of the flow rate after an electrostatic precipitator, but requires measurement of the flow rate before a carbon monoxide boiler.

#### *E. What New Monitoring Alternative is Available for a Catalytic Cracking Unit With a Wet Scrubber if the Unit Is Subject to the New Source Performance Standards for Petroleum Refineries?*

The NSPS for petroleum refineries (40 CFR part 60, subpart J) require a continuous opacity monitoring system (COMS) for a fluidized CCU to demonstrate continuous compliance with the opacity limit in 40 CFR 60.102(a)(2). Subpart UUU requires facilities that are already subject to the NSPS to meet the NSPS requirements, including the opacity limit and COMS requirements.

Technical experience has shown that COMS are not feasible for wet scrubber PM control systems. We have already acknowledged the technical problems associated with the use of COMS on wet scrubbers by requiring other monitoring methods (CPMS for pressure drop and liquid-to-gas ratio). However, these requirements apply under other compliance options and not to CCU already subject to the NSPS.

Some facilities with CCU subject to the NSPS use wet scrubbers to meet the PM limit and already have alternative monitoring requirements approved under the NSPS. For these reasons, one industry representative requested that the NESHAP accept alternative monitoring requirements that have already been approved under the NSPS. Therefore, we are adding a new paragraph (f) to 40 CFR 63.1573 to provide for use of the approved alternative under subpart UUU.

Monitoring alternatives for CCU subject to the NSPS that have already been approved may not meet the criteria for MACT standards. For example, the alternative may not include provisions for demonstrating continuous compliance such as meeting an operating limit, collecting and reducing monitoring data, and recordkeeping/reporting requirements. While we cannot automatically approve an alternative that we have not seen, we see no reason to require a second formal approval process for the same control system and emission limit. To this end, we have added procedures for requesting alternative requirements specific to this situation.

We are requiring that an owner or operator submit a copy of the approved alternative monitoring method in the notification of compliance status (or

before), along with a brief description of the continuous monitoring system, the applicable operating limit, and the continuous compliance requirements. We will contact you within 30 calendar days after receipt, to tell you if the alternative is approved. This alternative does not eliminate your responsibility to comply with the opacity limit, which would remain applicable for enforcement purposes. This option is not available to facilities that elect to comply with the NSPS requirements in subpart UUU. These facilities must request an alternative monitoring method under the procedures in 40 CFR 63.8(f).

#### *F. How Are we Clarifying the Emission Limitations for Catalytic Reforming Units?*

The requirements for organic HAP emissions in 40 CFR 63.1566(a)(3) state that the CRU emissions and operating limits in Tables 15 and 16 to subpart UUU apply to emissions from process vents that occur during depressuring and purging operations. The NESHAP specify in 40 CFR 63.1566(a)(4) that the limits do not apply to depressurizing and purging operations when the reactor vent pressure is 5 pounds per square inch (psig) or less. Applicable process vents include those used during unit depressurization, purging, coke burn, catalyst rejuvenation, and reduction or activation purge. Industry representatives noted the current language is unclear as to whether the limits apply only to the initial depressurization cycle or include subsequent depressuring and purging cycles when the reactor pressure is greater than 5 psig. In response, we are amending 40 CFR 63.1566(a)(3) to clarify our intent regarding the control of organic HAP emissions from CRU depressurizing and purging.

Our intent in the NESHAP was that the organic HAP requirements apply to the initial depressuring and catalyst purging operations that occur prior to coke burn-off. Organic HAP emissions are expected during the initial depressurization and catalyst purge cycles. No additional organic HAP emission controls are used during coke burn-off, beyond the combustion process inherent during this process, and our data indicate there are minimal organic emissions from coke burn-off and subsequent CRU regeneration cycle purges.

Industry representatives suggested that we limit the applicability of the emissions limit to only the initial depressuring and first nitrogen purge. We do expect that, after some number of purges, the HAP concentration in the

purge may be less than the required outlet HAP concentration from a combustion control device. Under the NESHAP, all purges greater than 5 psig go to a combustion control device (or equivalent combustion device), regardless of the HAP concentration in the affected stream.

Initially, we attempted to specify the number of purges to be controlled because the organic HAP emissions would generally be very low beyond the first or second purge. However, our information indicates that the purging processes vary widely (*e.g.*, different systems use different purge gases, different purge temperatures, and different amounts of purge gas per unit of catalyst). Consequently, specifying the number of purges that must be controlled does not necessarily reflect a performance level. Additionally, recent data show that, for some CRU purge conditions, subsequent purges after the initial nitrogen purge may contain substantial amounts of benzene—on the order of 100 parts per million by volume (ppmv), which translates to emissions of about 1 ton per year (tpy). For other process purging conditions, however, subsequent purges have very low levels of HAP. We concluded that mandating specific purging conditions would reduce operator flexibility and would make compliance, for certain CRU processes, to be technically infeasible. We decided, therefore, to clarify that uncontrolled purging operations greater than 5 psig are acceptable if the total organic carbon (TOC) concentration is less than the currently required outlet concentration of a combustion control device (*i.e.*, less than 20 ppmv), and to provide compliance options for these purges.

Furthermore, the background information supporting the performance achievable by a combustion control device indicates that the 20 ppmv emissions limit was established “by compound exit concentration” rather than by a specified indicator of TOC, such as propane. As the primary HAP of concern from these CRU depressuring and purging vents is benzene, it is more appropriate to establish the 20 ppmv emission limit as hexane (*i.e.*, a C<sub>6</sub> hydrocarbon) rather than as propane. We are, therefore, changing the CRU TOC concentration requirements (which are used as a surrogate for organic HAP) to 20 ppmv TOC or nonmethane TOC (dry basis as hexane), corrected to 3 percent oxygen. This applies to both the concentration limit for the control device and the concentration limit for emissions discharged directly to the atmosphere.

This approach adds compliance options for “uncontrolled” purging cycles that are greater than 5 psig and less than 20 ppmv TOC (dry basis as hexane). First, the purging conditions used by the plant to remove organic HAP from the CRU catalyst during controlled purges prior to direct release to the atmosphere must be specified in the operation, maintenance, and monitoring plan. An initial performance test is conducted on the first directly released catalyst purge (following the purging conditions specified in the plan) to demonstrate that the purges specified in the plan effectively achieve the required emission limit. Subsequently, adherence to the purging procedures as specified in the plan is used to demonstrate continuous compliance.

Industry representatives also requested that we clarify the emission limits for organic HAP emissions from CRU in 40 CFR 63.1567(a) to indicate which limits apply when different reactors in the CRU are regenerated in separate regeneration systems. The direct final rule amendments state that, in this case, the emission limits in Table 22 to subpart UUU apply to each separate regeneration system. The direct final rule amendments also clarify that the TOC outlet concentration limit is 20 ppmv dry basis as hexane.

In response to industry comments, we expanded the number of test methods that can be used to measure organic HAP emissions. For the 98 percent mass emission reduction standard, you can use EPA Method 25 in 40 CFR part 60, appendix A, to directly measure nonmethane TOC as carbon or the combination of EPA Methods 25A and 18 in 40 CFR part 60, appendix A, to determine nonmethane TOC emissions. If the outlet TOC concentration is expected to be less than 50 ppmv (as carbon), you can use EPA Method 25A to measure the TOC concentration as hexane. For the 20 ppmv concentration limit, you can measure the TOC concentration using EPA Method 25A or determine the nonmethane TOC concentration using the combination of Methods 25A and 18. We made changes to the equations in 40 CFR 63.1564 and relevant tables to make these distinctions. We also added a definition of “nonmethane TOC” to 40 CFR 63.1579.

The direct final rule amendments also clarify the inorganic HAP emission and operating limits to indicate that the requirements apply to each applicable CRU process vent during coke burn-off and catalyst rejuvenation. In response to industry comments, we are also changing the compliance equations in

40 CFR 63.1567 to allow for hydrogen chloride (HCl) measurements below detectable limits of the method after correction for oxygen content.

*G. How Are we Changing the Monitoring Requirements for Catalytic Reforming Units?*

The NESHAP allow plants to measure and record the pH of the water (or scrubbing liquid) exiting the scrubber at least once an hour as an alternative to a pH CPMS. After promulgation, industry representatives recommended that we allow alkalinity measurements as an alternative to pH. Alkalinity measurements are more reliable because they give the actual acid content of the water (or scrubbing liquid) while pH measurements indicate only how much (more or less) acid is needed. We agree and have changed 40 CFR 63.1573(b) to allow plants to measure and record the alkalinity of the water (or scrubbing liquid) exiting the wet scrubber at least once an hour during coke burn-off and catalyst rejuvenation using titration as an alternative to a CPMS. We have also changed Tables 23, 24, 25, and 28 to subpart UUU to include the alternative for alkalinity measurements. In response to industry comments, we have also allowed the pH alternative to apply to CRU meeting the HCl percent reduction standard.

The NESHAP allow plants to measure the catalytic regenerator exhaust gas flow rate from a CCU as an approved alternative to a CPMS if the unit does not introduce any other gas streams into the catalyst regeneration vent (*i.e.*, complete combustion units with no additional combustion devices). In response to industry comments, we have expanded the alternative in 40 CFR 63.1573(a) to apply to CRU that operate as a constant pressure system during the coke burn and rejuvenation cycles.

After promulgation, industry representatives recommended that we also expand the CRU monitoring requirements to allow gas flow rate measurements before or after the control device. We agree and have changed Tables 24 and 25 of subpart UUU accordingly.

In response to questions raised at implementation workshops for plant personnel, we have added provisions to the performance test requirements for CRU to reflect differences among semi-regenerative, cyclic, and continuous processes. The direct final rule amendments require plants to test semi-regenerative and cyclic units during the coke burn-off and catalyst rejuvenation cycle. However, the tests cannot be done during the first hour or the last 6 hours of the cycle for a semi-regenerative unit,

or during the first hour or the last 2 hours of the cycle for a cyclic regeneration unit. Plants must conduct the performance test for a continuous regeneration unit no sooner than 3 days after the process unit or control system startup.

*H. What New Options Are Available For a Catalytic Reforming Unit With an Internal Scrubbing System?*

Industry representatives expressed concern that the NESHAP do not contain provisions allowing a CRU with an internal scrubbing system to meet the percent reduction standard instead of the concentration limit for HCl emissions.

The direct final rule amendments change the rule language related to the HCl emissions limits (and other provisions) by removing the phrase "using a control device." These changes allow CRU with an internal scrubbing system or alternative emissions reduction technique to meet either the percent reduction standard or concentration limit. To improve understanding of the NESHAP, we have added a definition for "internal scrubbing system." The direct final rule amendments also add provisions to Tables 23 through 28 to subpart UUU for CRU with an internal scrubbing system meeting the HCl percent reduction standard and CRU with a fixed-bed or moving-bed gas-solid adsorption system.

The direct final rule amendments establish operating limits and compliance provisions specific to CRU with an internal scrubbing system meeting the HCl percent reduction standard. The operating limits require plants to maintain the daily average pH or alkalinity of the water (or scrubbing liquid) exiting the internal scrubbing system and the daily average liquid-to-gas ratio at or above the limit established during the performance test. Plants must conduct performance tests to demonstrate initial compliance with the applicable HCl emission standard and to establish operating limits. Performance test procedures are given for each type of system. To demonstrate continuous compliance, plants must install, operate, and maintain CPMS to monitor during coke burn-off and catalyst rejuvenation, the daily average pH or alkalinity of the water (or scrubbing liquid) exiting the internal scrubbing system, and the daily average liquid-to-gas ratio. Plants may use pH strips as an approved alternative to a pH CPMS, or discrete titration as an alternative to a CPMS for alkalinity.

*I. What New Options Are Available For a Catalytic Reforming Unit With a Different Type of Control System?*

Industry representatives and technology vendors expressed concern that the NESHAP do not include compliance provisions for continuous CRU that may use process modifications, pollution prevention control techniques, or alternative control systems other than internal or external (add-on) wet scrubbers to comply with the emission limitations. A refinery process design firm provided data indicating that gas-solid adsorption systems can meet the HCl emission limitations for CRU. The system also acted as a pollution prevention technique by reducing the total amount of chloriding agent needed during catalyst regeneration. The direct final rule amendments add provisions to accommodate these control scenarios. The new provisions improve the NESHAP by encouraging the use of new technologies that meet the MACT level of control.

Plants with a fixed-bed gas-adsorption system must meet two operating limits during coke burn-off and catalyst rejuvenation:

- The daily average temperature of the gas entering or exiting the adsorption system must not exceed the limit established during the performance test; and
- The HCl concentration in the adsorption system exhaust gas must not exceed the limit established during the performance test.

Plants must conduct a performance test to demonstrate initial compliance and to establish operating limits. To demonstrate continuous compliance, plants must install, operate, and maintain CPMS to monitor the daily average temperature of the gas entering or exiting the adsorption system. In addition, plants must monitor HCl during coke burn-off and catalyst rejuvenation using a colorimetric tube sampling system to measure the concentration in the adsorption system exhaust and at a point within the adsorbent bed not to exceed 90 percent of the total length of the bed. If the HCl concentration at the sampling location with the adsorption bed exceeds the operating limit, plants must follow the procedures in their operation and maintenance plan. These procedures must require, at a minimum, that plants remeasure the HCl concentration at both the adsorption system exhaust and at the sampling location within the adsorbent bed and replace the sorbent material in the bed before the next regeneration cycle if the HCl

concentration at either location is above the operating limit.

The direct final rule amendments also establish operating limits and compliance provisions for CRU with moving-bed gas-solid adsorption systems. The operating limits are:

- The daily average temperature of the gas entering or exiting the adsorption system must not exceed the limit established during the performance test;
- The weekly average chloride level on the sorbent entering the adsorption system must not exceed the design or manufacturer's recommended limit (1.35 weight percent for the Chlorsorb™ system); and
- The weekly average chloride level on the sorbent exiting the adsorption system must not exceed the design or manufacturer's recommended limit (1.8 weight percent for the Chlorsorb™ system).

Plants must conduct a performance test to demonstrate initial compliance and to establish an operating limit for the daily average gas temperature. To demonstrate continuous compliance, plants must monitor the daily average gas temperature using a CPMS. To demonstrate continuous compliance with the operating limits for chloride level, plants must collect and analyze samples of the sorbent entering and exiting the system for total chloride concentration using the new procedure, "Determination of Metal Concentration on Catalyst Particles (Instrument Analyzer Procedure)" in appendix A of these direct final amendments or the specified methods in EPA Publication No. SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (Revision 5, April 1998). Plants must determine and record the weekly chloride content and maintain the weekly average chloride content below the design operating limits.

#### *J. How Are We Changing The Requirements For Continuous Parameter Monitoring Systems?*

The technical specifications for CPMS in Table 41 to subpart UUU were added to the NESHAP after proposal based on provisions we have included in other NESHAP. We included these provisions to ensure that CPMS are installed, calibrated, and operated in a manner that would yield accurate and reliable information on the performance of control devices. Industry representatives objected to the inclusion of such detailed requirements after proposal with no opportunity to comment on the provisions.

We have decided not to include the performance specifications for CPMS in the rule at this time. As discussed in the preamble to the Generic MACT NESHAP amendments (67 FR 46260, July 12, 2002), we are currently developing Performance Specification (PS-17) for CPMS and quality assurance procedures that will apply to all sources subject to NESHAP under 40 CFR part 63. A proposed rule for these specifications is expected to be available in 2005. This approach will avoid the possibility that the specifications ultimately issued for all NESHAP differ significantly from those in the Petroleum Refineries NESHAP.

The NESHAP state that each CPMS must be installed, operated, and maintained according to the requirements in Table 41 of subpart UUU and in a manner consistent with the manufacturer's or other written procedures that provide adequate assurance that the equipment will monitor accurately. The amendments remove the reference to Table 41 from 40 CFR 63.1572(c) for those CPMS that will be covered by PS-17 and quality assurance procedures. Until PS-17 is available, facilities must install, operate, and maintain CPMS in a manner consistent with the manufacturer's or other written procedures that provide adequate assurance that the equipment will monitor accurately.

Table 41 to subpart UUU also contains requirements for pH strips and colorimetric sampling systems. These requirements were added to the NESHAP in response to comments and are not expected to be covered by the new PS-17 and quality assurance procedures. Consequently, we have not removed these requirements from the table.

#### *K. What Corrections Are We Making?*

We are correcting numbering errors and citations in several sections of the NESHAP. We are also amending the rule to correct publication errors in various tables.

We are correcting a unit conversion error in Tables 1 through 3 to subpart UUU. These tables cite the incremental PM emission rate for discharged gases that pass through an incinerator or waste heat boiler in which auxiliary or supplemental liquid or solid fossil fuel is burned as 43.0 grams per Megajoule of heat input attributable to the liquid or solid fossil fuel. The corrected value is 43.0 grams per Gigajoule; no change is being made to the English unit equivalent limit (0.10 pound per million British thermal units). We are making several minor corrections to these tables

to ensure that both limits are cited consistently and accurately.

We are correcting Table 5 to subpart UUU to list the proper test methods required for PM performance tests for metal HAP emissions. The amended table requires EPA Method 5B or 5F (40 CFR part 60, appendix A) to determine PM emissions and associated moisture content for a unit without a wet scrubber; EPA Method 5B is required to determine PM emissions and associated moisture content for a unit with a wet scrubber.

We are correcting Table 6 to subpart UUU to specify the use of Equation 1 (the proper equation for calculation of coke burn-off) rather than Equation 2.

We are correcting Table 18 to subpart UUU to correct a typographical error in a cross reference to certain requirements for flares in the NESHAP General Provisions (40 CFR part 63, subpart A).

We are correcting Tables 31, 33, and 34 to subpart UUU to clarify the monitoring and compliance requirements for a sulfur recovery unit subject to the TRS limit. Under this option, the owner or operator may use a TRS continuous emission monitoring system or CPMS, and the continuous compliance requirements depend on the type of monitoring system. The direct final rule amendments separate the requirements according to the type of monitoring system and clarify that compliance is based on a 12-hour rolling average like the NSPS requirements.

We also are clarifying our comment in the explanation column of Table 44 for the citation 40 CFR 63.6(i), which allows facilities to request a 1-year extension of compliance if necessary to install controls. We are revising the table to state that the extension of compliance under 40 CFR 63.6(i)(4) is not applicable to a facility that installs catalytic cracking feed hydrotreating and receives an extended compliance date under 40 CFR 63.1563(c). We are also revising Table 44 to subpart UUU to change the citation to 40 CFR 63.9(b)(3) to indicate its current reserved status under the NESHAP General Provisions (40 CFR part 63).

### **III. Summary of Non-Air Health, Environmental, Energy, and Cost Impacts**

The NESHAP will reduce emissions of many HAP emitted from the affected sources at petroleum refineries, including particulate metals, organics, and reduced sulfur compounds. When fully implemented, we estimate that HAP emissions will be reduced by nearly 11,000 tpy. Emissions of other pollutants such as volatile organic

compounds, particulate matter, carbon monoxide, and hydrogen sulfide will be reduced by about 60,000 tpy.

There will not be any adverse non-air health, environmental, energy, cost (or economic) impacts as a result of the direct final rule amendments because no new requirements are imposed on any facility. The new option for CRU will allow for the use of new control technology to meet the HCl emission limitations, which may reduce the costs and energy impacts of add-on controls.

#### IV. Statutory and Executive Order Reviews

##### A. Executive Order 12866: Regulatory Planning and Review

Under Executive Order 12866 (58 FR 5173, October 4, 1993), the EPA must determine whether the regulatory action is “significant” and, therefore, subject to Office of Management and Budget (OMB) review and the requirements of the Executive Order. The Executive Order defines “significant regulatory action” as one that is likely to result in standards that may:

- (1) Have an annual effect on the economy of \$100 million or more or adversely affect, in a material way, the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- (3) Materially alter the budgetary impact of entitlement, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- (4) raise novel legal or policy issues arising out of legal mandates, the President’s priorities, or the principles set forth in the Executive Order.

It has been determined that the direct final rule amendments are not a “significant regulatory action” under the terms of Executive Order 12866 and are, therefore, not subject to OMB review.

##### B. Paperwork Reduction Act

This action does not impose any new information collection burden. The direct final rule amendments consist primarily of new compliance options, clarifications, and corrections to the NESHAP that impose no new information collection requirements on industry or EPA. However, the OMB has previously approved the information collection requirements in the existing regulation (40 CFR part 63, subpart UUU) under the provisions of the Paperwork Reduction Act, 44 U.S.C.

3501 *et seq.*, and has assigned OMB control number 2060–0554, EPA Information Collection Request (ICR) number 1844.02. A copy of the OMB approved ICR may be obtained from Susan Auby, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW., Washington, DC 20460 or by calling (202) 566–1672.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purpose of collecting, validating, and verifying information; processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An Agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA’s regulations in 40 CFR part 63 are listed in 40 CFR part 9.

##### C. Regulatory Flexibility Act

The EPA has determined that it is not necessary to prepare a regulatory flexibility analysis in connection with the direct final rule amendments.

For purposes of assessing the impacts of today’s direct final rule amendments on small entities, small entity is defined as: (1) A small business as defined by the Small Business Administration’s regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impact of today’s direct final rule amendments on small entities, the EPA has concluded that this action will not have a significant economic impact on a substantial number of small entities. In determining whether a rule has a significant economic impact on a substantial number of small entities, the impact of concern is any significant adverse economic impact on small entities, since the primary purpose of

the regulatory flexibility analyses is to identify and address regulatory alternatives “which minimize any significant economic impact of the proposed rule on small entities” (5 U.S.C. 603 and 604). Thus, an agency may conclude that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, or otherwise has a positive economic effect on all of the small entities subject to the rule.

There will be a positive impact on small entities because the direct final rule amendments add new compliance provisions to increase flexibility, decrease unnecessary costs, and make clarifying changes to improve implementation of the NESHAP. These changes are voluntary and do not impose new costs. We have, therefore, concluded that today’s direct final rule amendments will relieve regulatory burden for all small entities.

##### D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, the EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with “Federal mandates” that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of \$100 million or more in any 1 year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires the EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows the EPA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before the EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments

to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

The EPA has determined that the direct final rule amendments do not contain a Federal mandate that may result in expenditures of \$100 million or more for State, local, and tribal governments, in aggregate, or the private sector in any 1 year. No new costs are attributable to the direct final rule amendments. Thus, today's direct final rule amendments are not subject to the requirements of sections 202 and 205 of the UMRA. The EPA has also determined that the direct final rule amendments contain no regulatory requirements that might significantly or uniquely affect small governments because they contain no requirements that apply to such governments or impose obligations upon them. Thus, the direct final rule amendments are not subject to the requirements of section 203 of the UMRA.

#### *E. Executive Order 13132: Federalism*

Executive Order 13132 (64 FR 43255, August 10, 1999) requires EPA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications." "Policies that have federalism implications" is defined in the Executive Order to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

The direct final rule amendments do not have federalism implications. They will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132, because State and local governments do not own or operate any sources that would be subject to the direct final rule amendments. Thus, Executive Order 13132 does not apply to the direct final rule amendments.

#### *F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments*

Executive Order 13175 (65 FR 67249, November 6, 2000) requires EPA to develop an accountable process to

ensure "meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications." The direct final rule amendments do not have tribal implications, as specified in Executive Order 13175, because tribal governments do not own or operate any sources subject to the direct final rule amendments. Thus, Executive Order 13175 does not apply to the direct final rule amendments.

#### *G. Executive Order 13045: Protection of Children From Environmental Health & Safety Risks*

Executive Order 13045 (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be "economically significant," as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, we must evaluate the environmental health or safety effects of the planned rule on children and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives.

We interpret Executive Order 13045 as applying only to those regulatory actions that are based on health or safety risks, such that the analysis required under section 5-501 of the Executive Order has the potential to influence the regulation. The direct final rule amendments are not subject to Executive Order 13045 because the NESHAP (and subsequent amendments) are based on technology performance and not on health or safety risks.

#### *H. Executive Order 13211: Actions That Significantly Affect Energy, Supply, Distribution, or Use*

The direct final rule amendments are not subject to Executive Order 13211 (66 FR 28355, May 22, 2001) because they are not a significant regulatory action under Executive Order 12866.

#### *I. National Technology Transfer and Advancement Act*

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104-113, § 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in the regulatory and procurement activities unless to do so would be inconsistent with applicable law or otherwise impracticable. Voluntary consensus standards are technical standards (e.g., material specifications, test methods, sampling procedures, business practices) developed or adopted by one or more

voluntary consensus bodies. The NTTAA requires Federal agencies to provide Congress, through annual reports to OMB, with explanations when an agency does not use available and applicable voluntary consensus standards.

The direct final rule amendments include a new procedure, "Determination of Metal Concentration on Catalyst Particles (Instrumental Analyzer Procedure)." This procedure was developed in consultation with industry experts and equipment vendors for the purpose of determining the metal or total chloride concentration on catalyst particles. This new procedure was not fully developed at the time the NESHAP were issued and reflects current practices used by many plants within the industry. The new procedure is not mandatory; plants also may use one of several existing EPA methods in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (EPA Publication SW-846, Revision 5, April 1998) or an alternative method satisfactory to the Administrator.

Consistent with the NTTAA, we conducted a search to identify voluntary consensus standards for use in determining the metal or total chloride concentration on catalyst particles. This search identified one voluntary consensus standard, ASTM D7085-04, "Standard Guide for Determination of Chemical Elements in Fluid Catalytic Cracking Catalysts by X-Ray Fluorescence Spectrometry (XRF)." This method contains detailed sample preparation procedures that may be a useful supplement to the instrumental method included in the direct final rule amendments. However, we have not adopted ASTM D7085-04 as an alternative to the instrumental method because the method does not include equivalent procedures for determining zero and calibration drift, instrument energy calibration, and calibration accuracy, or specific quality assurance procedures for analyzing calibration standards or catalyst samples.

#### *J. Congressional Review Act*

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. The EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller



General of the United States prior to publication of the rule in the **Federal Register**. This action is not a "major rule" as defined by 5 U.S.C. 804(2). The direct final rule amendments will be effective on April 11, 2005.

**List of Subjects in 40 CFR Part 63**

Environmental protection, Air pollution control, Hazardous substances, Reporting and recordkeeping requirements.

Dated: February 1, 2005.

**Stephen L. Johnson,**  
*Acting Administrator.*

■ For the reasons set out in the preamble, title 40, chapter I, part 63 of the Code of Federal Regulations is amended as follows:

**PART 63—[AMENDED]**

■ 1. The authority citation for part 63 continues to read as follows:

**Authority:** 42 U.S.C. 7401, *et seq.*

**Subpart UUU—[AMENDED]**

■ 2. Section 63.1562 is amended by revising paragraphs (b)(1) through (3) to read as follows:

**§ 63.1562 What parts of my plant are covered by this subpart?**

\* \* \* \* \*

(b) \* \* \*

(1) The process vent or group of process vents on fluidized catalytic cracking units that are associated with regeneration of the catalyst used in the unit (*i.e.*, the catalyst regeneration flue gas vent).

(2) The process vent or group of process vents on catalytic reforming units (including but not limited to semi-regenerative, cyclic, or continuous processes) that are associated with regeneration of the catalyst used in the unit. This affected source includes vents that are used during the unit depressurization, purging, coke burn, and catalyst rejuvenation.

(3) The process vent or group of process vents on Claus or other types of sulfur recovery plant units or the tail gas treatment units serving sulfur recovery plants, that are associated with sulfur recovery.

\* \* \* \* \*

■ 3. Section 63.1564(b)(4) is amended by revising the definition of the symbol "Q<sub>r</sub>" for Equation 1 of to read as follows:

**§ 63.1564 What are my requirements for metal HAP emissions from catalytic cracking units?**

\* \* \* \* \*

Q<sub>r</sub> = Volumetric flow rate of exhaust gas from catalyst regenerator before adding air or gas streams. Example: You may measure upstream or downstream of an electrostatic precipitator, but you must measure upstream of a carbon monoxide boiler, dscm/min (dscf/min). You may use the alternative in either § 63.1573(a)(1) or (a)(2), as applicable, to calculate Q<sub>r</sub>;

\* \* \* \* \*

■ 4. Section 63.1566 is amended by:

■ a. Revising paragraphs (a)(1)(ii) and (a)(3);

■ b. Revising paragraph (b)(4)(i) introductory text;

■ c. Revising the definitions of the symbols "E" and "M<sub>c</sub>" in Equation 1 of paragraph (b)(4)(i);

■ d. Revising Equation 2 of paragraph (b)(4)(i);

■ e. Redesignating paragraph (b)(5) as (b)(4)(ii);

■ f. Revising Equation 4 in the newly designated paragraph (b)(4)(ii); and

■ g. Redesignating paragraphs (b)(6) through (b)(9) as (b)(5) through (b)(8).

The revisions and additions read as follows:

**§ 63.1566 What are my requirements for organic HAP emissions from catalytic reforming units?**

(a) \* \* \*

(1) \* \* \*

(ii) You can elect to meet a TOC or nonmethane TOC percent reduction standard or concentration limit, whichever is less stringent (Option 2).

\* \* \* \* \*

(3) Except as provided in paragraph (a)(4) of this section, the emission limitations in Tables 15 and 16 of this subpart apply to emissions from catalytic reforming unit process vents associated with initial catalyst depressuring and catalyst purging operations that occur prior to the coke burn-off cycle. The emission limitations in Tables 15 and 16 of this subpart do

not apply to the coke burn-off, catalyst rejuvenation, reduction or activation vents, or to the control systems used for these vents.

\* \* \* \* \*

(b) \* \* \*

(4) \* \* \*

(i) If you elect the percent reduction standard under Option 2, calculate the emission rate of nonmethane TOC using Equation 1 of this section (if you use Method 25) or Equation 2 of this section (if you use Method 25A or Methods 25A and 18), then calculate the mass emission reduction using Equation 3 of this section as follows:

\* \* \* \* \*

(Eq. 1)

Where:

E = Emission rate of nonmethane TOC in the vent stream, kilograms-C per hour;

\* \* \* \* \*

M<sub>c</sub> = Mass concentration of total gaseous nonmethane organic (as carbon) as measured and calculated using Method 25 in appendix A to part 60 of this chapter, mg/dscm; and

\* \* \* \* \*

$$E = K_5 (C_{\text{TOC}} - \frac{1}{6} C_{\text{methane}}) Q_s \quad (\text{Eq. 2})$$

Where:

K<sub>5</sub> = Constant, 1.8 x 10<sup>-4</sup> (parts per million)<sup>-1</sup> (gram-mole per standard cubic meter) (gram-C per gram-mole-hexane) (kilogram per gram) (minutes per hour), where the standard temperature (standard cubic meter) is at 20 degrees C (uses 72g-C/g.mole hexane);

C<sub>TOC</sub> = Concentration of TOC on a dry basis in ppmv as hexane as measured by Method 25A in appendix A to part 60 of this chapter;

C<sub>methane</sub> = Concentration of methane on a dry basis in ppmv as measured by Method 18 in appendix A to part 60 of this chapter. If the concentration of methane is not determined, assume C<sub>methane</sub> equals zero; and

Q<sub>s</sub> = Vent stream flow rate, dry standard cubic meters per minute, at a temperature of 20 degrees C. \* \* \*

$$C_{\text{NMTOC, 3\%O}_2} = (C_{\text{TOC}} - \frac{1}{6} C_{\text{methane}}) \left( \frac{17.9\%}{20.9\% - \%O_2} \right) \quad (\text{Eq. 4})$$

Where:

C<sub>NMTOC, 3%O<sub>2</sub></sub> = Concentration of nonmethane TOC on a dry basis in

ppmv as hexane corrected to 3 percent oxygen.

- 5. Section 63.1567 is amended by:
- a. Revising paragraphs (a)(1) introductory text and (a)(1)(i);
- b. Redesignating paragraphs (b)(4) through (b)(6) as paragraphs (b)(5) through (b)(7); and
- c. Adding new paragraph (b)(4).

The addition and revisions read as follows:

**§ 63.1567 What are my requirements for inorganic HAP emissions from catalytic reforming units?**

(a) \* \* \*

(1) Meet each emission limitation in Table 22 to this subpart that applies to

you. If you operate a catalytic reforming unit in which different reactors in the catalytic reforming unit are regenerated in separate regeneration systems, then these emission limitations apply to each separate regeneration system. These emission limitations apply to emissions from catalytic reforming unit process vents associated with the coke burn-off and catalyst rejuvenation operations during coke burn-off and catalyst regeneration. You can choose from the two options in paragraphs (a)(1)(i) through (ii) of this section:

(i) You can elect to meet a percent reduction standard for hydrogen chloride (HCl) emissions (Option 1); or

\* \* \* \* \*

(b) \* \* \*

(4) Use the equations in paragraphs (b)(4)(i) through (iv) of this section to determine initial compliance with the emission limitations.

(i) Correct the measured HCl concentration for oxygen (O<sub>2</sub>) content in the gas stream using Equation 1 of this section as follows:

$$C_{\text{HCl, 3\%O}_2} = \left( \frac{17.9\%}{20.9\% - \%O_2} \right) C_{\text{HCl}} \quad (\text{Eq. 1})$$

Where:

C<sub>HCl,3% O<sub>2</sub></sub> = Concentration of HCl on a dry basis in ppmv corrected to 3 percent oxygen or 1 ppmv, whichever is greater;

C<sub>HCl</sub> = Concentration of HCl on a dry basis in ppmv, as measured by Method 26A in 40 CFR part 60, appendix A; and

%O<sub>2</sub> = Oxygen concentration in percent by volume (dry basis).

(ii) If you elect the percent reduction standard, calculate the emission rate of HCl using Equation 2 of this section; then calculate the mass emission reduction from the mass emission rates using Equation 3 of this section as follows:

$$E_{\text{HCl}} = K_6 C_{\text{HCl}} Q_s \quad (\text{Eq. 2})$$

Where:

E<sub>HCl</sub> = Emission rate of HCl in the vent stream, grams per hour;

K<sub>6</sub> = Constant, 0.091 (parts per million)<sup>-1</sup> (grams HCl per standard cubic meter) (minutes per hour), where the standard temperature (standard cubic meter) is at 20 degrees Celsius (C); and

Q<sub>s</sub> = Vent stream flow rate, dscm/min, at a temperature of 20 degrees C.

$$\text{HCl\%reduction} = \frac{E_{\text{HCl, i}} - E_{\text{HCl, o}}}{E_{\text{HCl, i}}} \times 100\% \quad (\text{Eq. 3})$$

Where:

E<sub>HCl,i</sub> = Mass emission rate of HCl at control device inlet, g/hr; and

E<sub>HCl,o</sub> = Mass emission rate of HCl at control device outlet, g/hr.

(iii) If you are required to use a colormetric tube sampling system to demonstrate continuous compliance with the HCl concentration operating

limit, calculate the HCl operating limit using Equation 4 of this section as follows:

$$C_{\text{HCl, ppmvLimit}} = 0.9 C_{\text{HCl, AveTube}} \left( \frac{C_{\text{HCl, RegLimit}}}{C_{\text{HCl, 3\%O}_2}} \right) \quad (\text{Eq. 4})$$

Where:

C<sub>HCl,ppmvLimit</sub> = Maximum permissible HCl concentration for the HCl concentration operating limit, ppmv;

C<sub>HCl,AveTube</sub> = Average HCl concentration from the colormetric tube sampling system, calculated as the arithmetic average of the average HCl

concentration measured for each performance test run, ppmv or 1 ppmv, whichever is greater; and  
C<sub>HCl,RegLimit</sub> = Maximum permissible outlet HCl concentration for the applicable catalytic reforming unit as listed in Table 22 of this subpart, either 10 or 30 ppmv.

(iv) If you are required to use a colormetric tube sampling system to demonstrate continuous compliance with the percent reduction operating limit, calculate the HCl operating limit using Equation 5 of this section as follows:

$$C_{\text{HCl, \%Limit}} = 0.9 C_{\text{HCl, AveTube}} \left( \frac{100 - \% \text{HClReduction}_{\text{Limit}}}{100 - \% \text{HClReduction}_{\text{Test}}} \right) \quad (\text{Eq. 5})$$

Where:

$C_{HCl, \%Limit}$  = Maximum permissible HCl concentration for the percent reduction operating limit, ppmv;

$\%HCl\ Reduction_{Limit}$  = Minimum permissible HCl reduction for the applicable catalytic reforming unit as listed in Table 22 of this subpart, either 97 or 92 percent; and

$\%HCl\ Reduction_{Test}$  = Average percent HCl reduction calculated as the arithmetic average HCl reduction calculated using Equation 3 of this section for each performance source test, percent.

\* \* \* \* \*

■ 6. Section 63.1572 is amended by revising paragraphs (c) introductory text and (c)(1) to read as follows:

**§ 63.1572 What are my monitoring installation, operation, and maintenance requirements?**

\* \* \* \* \*

(c) You must install, operate, and maintain each continuous parameter monitoring system according to the requirements in paragraphs (c)(1) through (5) of this section.

(1) The owner or operator shall install, operate, and maintain each

continuous parameter monitoring system in a manner consistent with the manufacturer's specifications or other written procedures that provide adequate assurance that the equipment will monitor accurately. The owner or operator shall also meet the equipment specifications in Table 41 of this subpart if pH strips or colorimetric tube sampling systems are used.

\* \* \* \* \*

- 7. Section 63.1573 is amended by:
  - a. Revising paragraphs (a) and (b); and
  - b. Adding new paragraph (f).

The revisions and addition read as follows:

**§ 63.1573 What are my monitoring alternatives?**

(a) *What are the approved alternatives for measuring gas flow rate?* (1) You may use this alternative to a continuous parameter monitoring system for the catalytic regenerator exhaust gas flow rate for your catalytic cracking unit if the unit does not introduce any other gas streams into the catalyst regeneration vent (i.e., complete combustion units with no additional combustion devices). You may also use this alternative to a continuous

parameter monitoring system for the catalytic regenerator atmospheric exhaust gas flow rate for your catalytic reforming unit during the coke burn and rejuvenation cycles if the unit operates as a constant pressure system during these cycles. If you use this alternative, you shall use the same procedure for the performance test and for monitoring after the performance test. You shall:

(i) Install and operate a continuous parameter monitoring system to measure and record the hourly average volumetric air flow rate to the catalytic cracking unit or catalytic reforming unit regenerator. Or, you may determine and record the hourly average volumetric air flow rate to the catalytic cracking unit or catalytic reforming unit regenerator using the appropriate control room instrumentation.

(ii) Install and operate a continuous parameter monitoring system to measure and record the temperature of the gases entering the control device (or exiting the catalyst regenerator if you do not use an add-on control device).

(iii) Calculate and record the hourly average actual exhaust gas flow rate using Equation 1 of this section as follows:

$$Q_{gas} = (1.12\text{scfm/dscfm}) \times (Q_{air} + Q_{other}) \times \left( \frac{\text{Temp}_{gas}}{293^\circ\text{K}} \right) \times \left( \frac{\text{latm.}}{P_{vent}} \right) \quad (\text{Eq. 1})$$

Where:

$Q_{gas}$  = Hourly average actual gas flow rate, acfm;

1.12 = Default correction factor to convert gas flow from dry standard cubic feet per minute (dscfm) to standard cubic feet per minute (scfm);

$Q_{air}$  = Volumetric flow rate of air to regenerator, as determined from the control room instrumentations, dscfm;

$Q_{other}$  = Volumetric flow rate of other gases entering the regenerator as determined from the control room instrumentations, dscfm. (Examples of "other" gases include an oxygen-enriched air stream to catalytic cracking unit regenerators and a nitrogen stream to catalytic reforming unit regenerators.);

$\text{Temp}_{gas}$  = Temperature of gas stream in vent measured as near as practical to the control device or opacity monitor, °K. For wet scrubbers, temperature of gas prior to the wet scrubber; and

$P_{vent}$  = Absolute pressure in the vent measured as near as practical to the control device or opacity monitor, as applicable, atm. When used to assess the gas flow rate in the final atmospheric vent stack, you can assume  $P_{vent} = 1$  atm.

(2) You may use this alternative to calculating  $Q_r$ , the volumetric flow rate of exhaust gas for the catalytic cracking regenerator as required in Equation 1 of § 63.1564, if you have a gas analyzer installed in the catalytic cracking regenerator exhaust vent prior to the addition of air or other gas streams. You may measure upstream or downstream

of an electrostatic precipitator, but you shall measure upstream of a carbon monoxide boiler. You shall:

(i) Install and operate a continuous parameter monitoring system to measure and record the hourly average volumetric air flow rate to the catalytic cracking unit regenerator. Or, you can determine and record the hourly average volumetric air flow rate to the catalytic cracking unit regenerator using the catalytic cracking unit control room instrumentation.

(ii) Install and operate a continuous gas analyzer to measure and record the concentration of carbon dioxide, carbon monoxide, and oxygen of the catalytic cracking regenerator exhaust.

(iii) Calculate and record the hourly average flow rate using Equation 2 of this section as follows:

$$Q_r = \frac{79 \times Q_{air} + (100 - \%O_{xy}) \times Q_{oxy}}{100 - \%CO_2 - \%CO - \%O_2} \quad (\text{Eq. 2})$$

Where:

$Q_r$  = Volumetric flow rate of exhaust gas from the catalyst regenerator before adding air or gas streams, dscm/min (dscf/min);

79 = Default concentration of nitrogen and argon in dry air, percent by volume (dry basis);

$\%O_{xy}$  = Oxygen concentration in oxygen-enriched air stream, percent by volume (dry basis);

$Q_{oxy}$  = Volumetric flow rate of oxygen-enriched air stream to regenerator as determined from the catalytic cracking unit control room instrumentations, dscm/min (dscf/min);

$\%CO_2$  = Carbon dioxide concentration in regenerator exhaust, percent by volume (dry basis);

CO = Carbon monoxide concentration in regenerator exhaust, percent by volume (dry basis); and

$\%O_2$  = Oxygen concentration in regenerator exhaust, percent by volume (dry basis).

(b) *What is the approved alternative for monitoring pH or alkalinity levels?*

You may use the alternative in paragraph (b)(1) or (2) of this section for a catalytic reforming unit.

(1) You shall measure and record the pH of the water (or scrubbing liquid) exiting the wet scrubber or internal scrubbing system at least once an hour during coke burn-off and catalyst rejuvenation using pH strips as an alternative to a continuous parameter monitoring system. The pH strips must meet the requirements in Table 41 of this subpart.

(2) You shall measure and record the alkalinity of the water (or scrubbing liquid) exiting the wet scrubber or internal scrubbing system at least once an hour during coke burn-off and catalyst rejuvenation using titration as an alternative to a continuous parameter monitoring system.

\* \* \* \* \*

(f) *How do I apply for alternative monitoring requirements if my catalytic cracking unit is equipped with a wet scrubber and I have approved alternative monitoring requirements under the new source performance standards for petroleum refineries?*

(1) You may request alternative monitoring requirements according to the procedures in this paragraph if you meet each of the conditions in paragraphs (f)(1)(i) through (iii) of this section:

(i) Your fluid catalytic cracking unit regenerator vent is subject to the PM limit in 40 CFR 60.102(a)(1) and uses a wet scrubber for PM emissions control;

(ii) You have alternative monitoring requirements for the continuous opacity

monitoring system requirement in 40 CFR 60.105(a)(1) approved by the Administrator; and

(iii) You are required by this subpart to install, operate, and maintain a continuous opacity monitoring system for the same catalytic cracking unit regenerator vent for which you have approved alternative monitoring requirements.

(2) You can request approval to use an alternative monitoring method prior to submitting your notification of compliance status, in your notification of compliance status, or at any time.

(3) You must submit a copy of the approved alternative monitoring requirements along with a monitoring plan that includes a description of the continuous monitoring system or method, including appropriate operating parameters that will be monitored, test results demonstrating compliance with the opacity limit used to establish an enforceable operating limit(s), and the frequency of measuring and recording to establish continuous compliance. If applicable, you must also include operation and maintenance requirements for the continuous monitoring system.

(4) We will contact you within 30 days of receipt of your application to inform you of approval or of our intent to disapprove your request.

■ 8. Section 63.1574 is amended by:

■ a. Revising paragraph (a)(3)(ii);

■ b. Revising paragraph (c); and

■ c. Revising the first sentence of paragraph (f) introductory text, revising paragraph (f)(2) introductory text, revising paragraphs (f)(2)(vi) and (f)(2)(x), and adding new paragraphs (f)(2)(xi) and (xii).

The revisions read as follows:

**§ 63.1574 What notifications must I submit and when?**

(a) \* \* \*

(3) \* \* \*

(ii) For each initial compliance demonstration that includes a performance test, you must submit the notification of compliance status, including the performance test results, no later than 150 calendar days after the compliance date specified for your affected source in § 63.1563.

\* \* \* \* \*

(c) If you startup your new or reconstructed affected source on or after April 11, 2002, you must submit the initial notification no later than 120 days after you become subject to this subpart.

\* \* \* \* \*

(f) As required by this subpart, you must prepare and implement an

operation, maintenance, and monitoring plan for each control system and continuous monitoring system for each affected source. \* \* \*

(2) Each plan must include, at a minimum, the information specified in paragraphs (f)(2)(i) through (xii) of this section.

\* \* \* \* \*

(vi) Procedures you will use to determine the HCl concentration of gases from a catalytic reforming unit when you use a colorimetric tube sampling system, including procedures for correcting for pressure (if applicable to the sampling equipment) and the sampling locations that will be used for compliance monitoring purposes.

\* \* \* \* \*

(x) Maintenance schedule for each monitoring system and control device for each affected source that is generally consistent with the manufacturer's instructions for routine and long-term maintenance.

(xi) If you use a fixed-bed gas-solid adsorption system to control emissions from a catalytic reforming unit, you must implement corrective action procedures if the HCl concentration measured at the selected compliance monitoring sampling location within the bed exceeds the operating limit. These procedures must require, at minimum, repeat measurement and recording of the HCl concentration in the adsorption system exhaust gases and at the selected compliance monitoring sampling location within the bed. If the HCl concentration at the selected compliance monitoring location within the bed is above the operating limit during the repeat measurement while the HCl concentration in the adsorption system exhaust gases remains below the operating limit, the adsorption bed must be replaced as soon as practicable. Your procedures must specify the sampling frequency that will be used to monitor the HCl concentration in the adsorption system exhaust gases subsequent to the repeat measurement and prior to replacement of the sorbent material (but not less frequent than once every 4 hours during coke burn-off). If the HCl concentration of the adsorption system exhaust gases is above the operating limit when measured at any time, the adsorption bed must be replaced within 24 hours or before the next regeneration cycle, whichever is longer.

(xii) Procedures that will be used for purging the catalyst if you do not use a control device to comply with the organic HAP emission limits for catalytic reforming units. These procedures will include, but are not limited to, specification of the minimum

catalyst temperature and the minimum cumulative volume of gas per mass of catalyst used for purging prior to uncontrolled releases (i.e., during uncontrolled purging events); the maximum purge gas temperature for uncontrolled purge events; and specification of the monitoring systems that will be used to monitor and record data during each purge event.

■ 9. Section 63.1576 is amended by revising paragraph (a)(2) to read as follows:

**§ 63.1576 What records must I keep, in what form, and for how long?**

(a) \* \* \*

(2) The records in § 63.6(e)(3)(iii) through (v) related to startup, shutdown, and malfunction.

\* \* \* \* \*

■ 10. Section 63.1579 is amended by:

■ a. Adding, in alphabetical order, new definitions for the terms “Internal scrubbing system” and “Nonmethane TOC”; and

■ b. Revising the definition for the term “TOC.”

The additions and revision read as follows:

**§ 63.1579 What definitions apply to this subpart?**

\* \* \* \* \*

*Internal scrubbing system* means a wet scrubbing, wet injection, or caustic injection control device that treats (in-situ) the catalytic reforming unit recirculating coke burn exhaust gases for acid (HCl) control during reforming catalyst regeneration upstream of the atmospheric coke burn vent.

\* \* \* \* \*

*Nonmethane TOC* means, for the purposes of this subpart, emissions of total organic compounds, excluding methane, that serve as a surrogate measure of the total emissions of organic HAP compounds including, but not limited to, acetaldehyde, benzene, hexane, phenol, toluene, and xylenes and nonHAP VOC as measured by Method 25 in appendix A to part 60 of this chapter, by the combination of Methods 18 and 25A in appendix A to

part 60 of this chapter, or by an approved alternative method.

\* \* \* \* \*

*TOC* means, for the purposes of this subpart, emissions of total organic compounds that serve as a surrogate measure of the total emissions of organic HAP compounds including, but not limited to, acetaldehyde, benzene, hexane, phenol, toluene, and xylenes and nonHAP VOC as measured by Method 25A in appendix A to part 60 of this chapter or by an approved alternative method.

\* \* \* \* \*

■ 11. Tables 1 through 44 to subpart UUU of part 63 are amended to remove the phrase, “you must” and add in its place the phrase “you shall” in the introductory text and in the last column heading, where applicable (i.e., Tables 1 through 3, 6 through 10, 13 through 17, 20 through 24, 27 through 31, 34 through 37, 39, and 41 through 43).

■ 12. Table 1 to subpart UUU of part 63 is amended to revising entries 1 and 2 to read as follows:

TABLE 1 TO SUBPART UUU OF PART 63—METAL HAP EMISSION LIMITS FOR CATALYTIC CRACKING UNITS.

\* \* \* \* \*

For each new or existing catalytic cracking unit . . .	You shall meet the following emission limits for each catalyst regenerator vent . . .
1. Subject to new source performance standard (NSPS) for PM in 40 CFR 60.102.	PM emissions must not the exceed 1.0 kilogram (kg) per 1,000 kg (1.0 lb/1,000 lb) of coke burn-off in the catalyst regenerator; if the discharged gases pass through an incinerator or waste heat boiler in which you burn auxiliary or in supplemental liquid or solid fossil fuel, the incremental rate of PM emissions must not exceed 43.0 grams per Gigajoule (g/GJ) or 0.10 pounds per million British thermal units (lb/million Btu) of heat input attributable to the liquid or solid fossil fuel; and the opacity of emissions must not exceed 30 percent, except for one 6-minute average opacity reading in any 1-hour period.
2. Option 1: NSPS requirements not subject to the NSPS for PM in 40 CFR 60.102.	PM emissions must not exceed 1.0 kg/1,000 kg (1.0 lb/1,000 lb) of coke burn-off in the catalyst regenerator; if the discharged gases pass through an incinerator or waste heat boiler in which you burn auxiliary or supplemental liquid or solid fossil fuel, the incremental rate of PM must not exceed 43.0 g/GJ (0.10 lb/million Btu) of heat input attributable to the liquid or solid fossil fuel; and the opacity of emissions must not exceed 30 percent, except for one 6-minute average opacity reading in any 1-hour period.
*	*

■ 13. Table 3 to subpart UUU of part 63 is revised to read as follows:

TABLE 3 TO SUBPART UUU OF PART 63.—CONTINUOUS MONITORING SYSTEMS FOR METAL HAP EMISSIONS FROM CATALYTIC CRACKING UNITS

[As stated in § 63.1564(b)(1), you shall meet each requirement in the following table that applies to you.]

For each new or existing catalytic cracking unit . . .	If your catalytic cracking unit is . . .	And you use this type of control device for your vent . . .	You shall install, operate, and maintain a . . .
1. Subject to the NSPS for PM in 40 CFR 60.102.	Any size .....	Electrostatic precipitator or wet scrubber or no control device.	Continuous opacity monitoring system to measure and record the opacity of emissions from each catalyst regenerator vent.

TABLE 3 TO SUBPART UUU OF PART 63.—CONTINUOUS MONITORING SYSTEMS FOR METAL HAP EMISSIONS FROM CATALYTIC CRACKING UNITS—Continued

[As stated in § 63.1564(b)(1), you shall meet each requirement in the following table that applies to you.]

For each new or existing catalytic cracking unit . . .	If your catalytic cracking unit is . . .	And you use this type of control device for your vent . . .	You shall install, operate, and maintain a . . .
2. Option 1: NSPS limits not subject to the NSPS for PM in 40 CFR 60.102.	Any size .....	Electrostatic precipitator or wet scrubber or no control device.	Continuous opacity monitoring system to measure and record the opacity of emissions from each catalyst regenerator vent.
3. Option 2: PM limit not subject to the NSPS for PM in 40 CFR 60.102.	a. Over 20,000 barrels per day fresh feed capacity.	Electrostatic precipitator .....	Continuous opacity monitoring system to measure and record the opacity of emissions from each catalyst regenerator vent.
	b. Up to 20,000 barrels per day fresh feed capacity.	Electrostatic precipitator .....	Continuous opacity monitoring system to measure and record the opacity of emissions from each catalyst regenerator vent; or continuous parameter monitoring systems to measure and record the gas flow rate entering or exiting the control device <sup>1</sup> and the voltage and secondary current (or total power input) to the control device.
	c. Any size .....	i. Wet scrubber .....	(1) Continuous parameter monitoring system to measure and record the pressure drop across the scrubber, gas flow rate entering or exiting the control device <sup>1</sup> , and total liquid (or scrubbing liquor) flow rate to the control device. (2) If you use a wet scrubber of the non-venturi jet-ejector design, you're not required to install and operate a continuous parameter monitoring system for pressure drop.
	d. Any size .....	No electrostatic precipitator or wet scrubber.	Continuous opacity monitoring system to measure and record the opacity of emissions from each catalyst regenerator vent.
4. Option 3: Ni lb/hr not subject to the NSPS for PM in 40 CFR 60.102.	a. Over 20,000 barrels per day fresh feed capacity.	Electrostatic precipitator .....	Continuous opacity monitoring system to measure and record the opacity of emissions from each catalyst regenerator vent and continuous parameter monitoring system to measure and record the gas flow rate entering or exiting the control device <sup>1</sup> .
	b. Up to 20,000 barrels per day fresh feed capacity.	Electrostatic precipitator .....	Continuous opacity monitoring system to measure and record the opacity of emissions from each catalyst regenerator vent and continuous parameter monitoring system to measure and record the gas flow rate entering or exiting the control device <sup>1</sup> ; or continuous parameter monitoring systems to measure and record the gas flow rate entering or exiting the control device <sup>1</sup> and the voltage and secondary current (or total power input) to the control device.

TABLE 3 TO SUBPART UUU OF PART 63.—CONTINUOUS MONITORING SYSTEMS FOR METAL HAP EMISSIONS FROM CATALYTIC CRACKING UNITS—Continued

[As stated in § 63.1564(b)(1), you shall meet each requirement in the following table that applies to you.]

For each new or existing catalytic cracking unit . . .	If your catalytic cracking unit is . . .	And you use this type of control device for your vent . . .	You shall install, operate, and maintain a . . .
5. Option 4: Ni lb/1,000 lbs of coke burn-off not subject to the NSPS for PM in 40 CFR 60.102.	c. Any size .....	Wet scrubber .....	(1) Continuous parameter monitoring system to measure and record the pressure drop across the scrubber, gas flow rate entering or exiting the control device <sup>1</sup> , and total liquid (or scrubbing liquor) flow rate to the control device. (2) If you use a wet scrubber of the non-venturi jet-ejector design, you're not required to install and operate a continuous parameter monitoring system for pressure drop.
	d. Any size .....	No electrostatic precipitator or wet scrubber.	Continuous opacity monitoring system to measure and record the opacity of emissions from each catalyst regenerator vent and continuous parameter monitoring system to measure and record the gas flow rate <sup>1</sup> .
	a. Over 20,000 barrels per day fresh feed capacity.	Electrostatic precipitator .....	Continuous opacity monitoring system to measure and record the opacity of emissions from each catalyst regenerator vent and continuous parameter monitoring system to measure and record the gas flow rate entering or exiting the control device <sup>1</sup> .
	b. Up to 20,000 barrels per day fresh feed capacity.	Electrostatic precipitator .....	Continuous opacity monitoring system to measure and record the opacity of emissions from each catalyst regenerator vent and continuous parameter monitoring system to measure and record the gas flow rate entering or exiting the control device <sup>1</sup> ; or continuous parameter monitoring systems to measure and record the gas flow rate entering or exiting the control device <sup>1</sup> and the voltage and secondary current (or total power input) to the control device.
	c. Any size .....	Wet scrubber .....	Continuous parameter monitoring system to measure and record the pressure drop across the scrubber, gas flow rate entering or exiting the control device <sup>1</sup> , and total liquid (or scrubbing liquor) flow rate to the control device.
	d. Any size .....	No electrostatic precipitator or wet scrubber.	Continuous opacity monitoring system to measure and record the opacity of emissions from each catalyst regenerator vent and continuous parameter monitoring system to measure and record the gas flow rate <sup>1</sup> .

<sup>1</sup> If applicable, you can use the alternative in § 63.1573(a)(1) instead of a continuous parameter monitoring system for gas flow rate.

■ 14. Table 4 to subpart UUU of part 63 is amended by revising entries 2, 3, 4, and 5; revising footnote 1; and adding new footnote 2 to read as follows:

TABLE 4 TO SUBPART UUU OF PART 63—REQUIREMENTS FOR PERFORMANCE TESTS FOR METAL HAP EMISSIONS FROM CATALYTIC CRACKING UNITS NOT SUBJECT TO THE NEW SOURCE PERFORMANCE STANDARDS (NSPS) FOR PARTICULATE MATTER (PM)

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TABLE 4 TO SUBPART UUU OF PART 63—REQUIREMENTS FOR PERFORMANCE TESTS FOR METAL HAP EMISSIONS FROM CATALYTIC CRACKING UNITS NOT SUBJECT TO THE NEW SOURCE PERFORMANCE STANDARDS (NSPS) FOR PARTICULATE MATTER (PM)—Continued

*	*	*	*	*	*	*
For each new or existing catalytic cracking unit catalyst regenerator vent . . .	You shall . . .	Using . . .	According to these requirements . . .			
	b. Compute Ni emission rate (lb/1,000 lbs of coke burn-off).	Equations 1 and 8 of § 63.1564.				
	c. Determine the equilibrium catalyst Ni concentration.	See item 4.c. of this table.	You must obtain 1 sample for each of the 3 runs; determine and record the equilibrium catalyst Ni concentration for each of the 3 samples; and you may adjust the laboratory results to the maximum value using Equation 2 of § 63.1571.			
	d. If you use a continuous opacity monitoring system, establish your site-specific Ni operating limit.	i. Equations 9 and 10 of § 63.1564 with data from continuous opacity monitoring system, coke burn-off rate, results of equilibrium catalyst Ni concentration analysis, and Ni emission rate from Method 29 test.	(1) You must collect opacity monitoring data every 10 seconds during the entire period of the initial Ni performance test; reduce the data to 6-minute averages; and determine and record the hourly average opacity from all the 6-minute averages. (2) You must collect gas flow rate monitoring data every 15 minutes during the entire period of the initial Ni performance test; measure the gas flow rate as near as practical to the continuous opacity monitoring system; and determine and record the hourly average actual gas flow rate from all the readings.			
	e. Record the catalyst addition rate for each test and schedule for the 10-day period prior to the test.					
*	*	*	*	*	*	*

<sup>1</sup>Determination of Metal Concentration on Catalyst Particles (Instrumental Analyzer Procedure).

<sup>2</sup>EPA Method 6010B, Inductively Coupled Plasma-Atomic Emission Spectrometry, EPA Method 6020, Inductively Coupled Plasma-Mass Spectrometry, EPA Method 7520, Nickel Atomic Absorption, Direct Aspiration, and EPA Method 7521, Nickel Atomic Absorption, Direct Aspiration are included in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, Revision 5 (April 1998). The SW-846 and Updates (document number 955-001-00000-1) are available for purchase from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, (202) 512-1800; and from the National Technical Information Services (NTIS), 5285 Port Royal Road, Springfield, VA 22161, (703) 487-4650. Copies may be inspected at the EPA Docket Center (Air Docket), EPA West, Room B-108, 1301 Constitution Ave., NW., Washington, DC; or at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC.

■ 15. Table 5 to subpart UUU of part 63 is amended by revising entries 1, 2, and 3 to read as follows:

TABLE 5 TO SUBPART UUU OF PART 63.—INITIAL-COMPLIANCE WITH METAL HAP EMISSION LIMITS FOR CATALYTIC CRACKING UNITS

\* \* \* \* \*

For each new and existing catalytic cracking unit catalyst regenerator vent . . .

For the following emission limit . . .

You have demonstrated initial compliance if . . .

1. Subject to the NSPS for PM in 40 CFR 60.102.	PM emissions must not exceed 1.0 kg/1,000 kg (1.0 lb/1,000 lb) of coke burn-off in the catalyst regenerator; if the discharged gases pass through an incinerator or waste heat boiler in which you burn auxiliary or supplemental liquid or solid fossil fuel, the incremental rate of PM must not exceed 43.0 grams per Gigajoule (g/GJ) or 0.10 pounds per million British thermal units (lb/million Btu) of heat input attributable to the liquid or solid fossil fuel; and the opacity of emissions must not exceed 30 percent, except for one 6-minute average opacity reading in any 1-hour period.	You have already conducted a performance test to demonstrate initial compliance with the NSPS and the measured PM emission rate is less than or equal to 1.0 kg/1,000 kg (1.0 lb/1,000 lb) of coke burn-off in the catalyst regenerator. As part of the Notification of Compliance Status, you must certify that your vent meets the PM limit. You are not required to do another performance test to demonstrate initial compliance. If applicable, you have already conducted a performance test to demonstrate initial compliance with the NSPS and the measured PM rate is less than or equal to 43.0 g/GJ (0.10 lb/million Btu) of heat input attributable to the liquid or solid fossil fuel. As part of the Notification of Compliance Status, you must certify that your vent meets the PM emission limit. You are not required to do another performance test to demonstrate initial compliance. You have already conducted a performance test to demonstrate initial compliance with the NSPS and the average hourly opacity is no more than 30 percent. Except: One 6-minute average in any 1-hour period can exceed 30 percent. As part of the Notification of Compliance Status, you must certify that your vent meets the opacity limit. You are not required to do another performance test to demonstrate initial compliance. You have already conducted a performance evaluation to demonstrate initial compliance with the applicable performance specification. As part of your Notification of Compliance Status, you certify that your continuous opacity monitoring system meets the requirements in §63.1572. You are not required to do a performance evaluation to demonstrate initial compliance.
2. Option 1: Elect NSPS not subject to the NSPS for PM.	PM emission must not exceed 1.0 kg/1,000 kg (1.0 lb/1,000 lb) of coke burn-off in the catalyst regenerator; if the discharged gases pass through an incinerator or waste heat boiler in which you burn auxiliary or supplemental liquid or solid fossil fuel, the incremental rate of PM must not exceed 43.0 g/GJ (0.10 lb/million Btu) of heat input attributable to the liquid or solid fossil fuel; and the opacity of emissions must not exceed 30 percent, except for one 6-minute average opacity reading in any 1-hour period.	The average PM emission rate, measured using EPA Method 5B or 5F (for a unit without a wet scrubber) or 5B (for a unit with a wet scrubber), over the period of the initial performance test, is no higher than 1.0 kg/1,000 kg (1.0 lb/1,000 lb) of coke burn-off in the catalyst regenerator. The PM emission rate is calculated using Equations 1 and 2 of §63.1564. If applicable, the average PM emission rate, measured using EPA Method 5B emission rate, measured using EPA Method 5B or 5F (for a unit without a wet scrubber) or Method 5B (for a unit with a wet scrubber) over the period of the initial performance test, is no higher than 43.0 g/GJ (0.10 lb/million Btu) of heat input attributable to the liquid or solid fossil fuel. The PM emission rate is calculated using Equation 3 of §63.1564; no more than one 6-minute average measured by the continuous opacity monitoring system exceeds 30 percent opacity in any 1-hour period over the period of the performance test; and your performance evaluation shows the continuous opacity monitoring system meets the applicable requirements in §63.1572.
3. Option 2: Not subject to the NSPS for PM.	PM emissions must not exceed 1.0 kg/1,000 kg (1.0 lb/1,000 lb) of coke burn-off in the catalyst regenerator.	The average PM emission rate, measured using EPA Method 5B or 5F (for a unit without a wet scrubber) or Method 5B (for a unit with a wet scrubber), over the period of the initial performance test, is less than or equal to 1.0 kg/1,000 kg (1.0 lb/1,000 lb) of coke burn-off in the catalyst regenerator. The PM emission rate is calculated using Equations 1 and 2 of §63.1564; and if you use a continuous opacity monitoring system, your performance evaluation shows the system meets the applicable requirements in §63.1572.

TABLE 5 TO SUBPART UUU OF PART 63.—INITIAL-COMPLIANCE WITH METAL HAP EMISSION LIMITS FOR CATALYTIC CRACKING UNITS—Continued

\* \* \* \* \*

For each new and existing catalytic cracking unit catalyst regenerator vent . . .	For the following emission limit . . .	You have demonstrated initial compliance if . . .
*	*	*

■ 16. Table 6 to subpart UUU of part 63 is amended by revising entries 1, 3, and 5 to read as follows:

TABLE 6 TO SUBPART UUU OF PART 63—CONTINUOUS COMPLIANCE WITH METAL HAP EMISSION LIMITS FOR CATALYTIC CRACKING UNITS

\* \* \* \* \*

For each new and existing catalytic cracking unit . . .	Subject to this emission limit for your catalyst regenerator vent . . .	You shall demonstrate continuous compliance by . . .
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1. Subject to the NSPS for PM in 40 CFR 60.102.	a. PM emissions must not exceed 1.0 kg/1,000 kg (1.0 lb/1,000 lb) of coke burn-off in the catalyst regenerator; if the discharged gases pass through an incinerator or waste heat boiler in which you burn auxiliary or supplemental liquid or solid fossil fuel, the incremental rate of PM must not exceed 43.0 g/GJ (0.10 lb/million Btu) of heat input attributable to the liquid or solid fossil fuel; and the opacity of emissions must not exceed 30 percent, except for one 6-minute average opacity reading in any 1-hour period.	i. Determining and recording each day the average coke burn-off rate (thousands of kilograms per hour) using Equation 1 in §63.1564 and the hours of operation for each catalyst regenerator; maintaining PM emission rate below 1.0 kg/1,000 kg (1.0 lb/1,000 lbs) of coke burn-off; if applicable, determining and recording each day the rate of combustion of liquid or solid fossil fuels (liters/hour or kilograms/hour) and the hours of operation during which liquid or solid fossil-fuels are combusted in the incinerator-waste heat boiler; if applicable, maintaining the PM rate incinerator below 43 g/GJ (0.10 lb/million Btu) of heat input attributable to the solid or liquid fossil fuel; collecting the continuous opacity monitoring data for each catalyst regenerator vent according to §63.1572; and maintaining each 6-minute average at or below 30 percent except that one 6-minute average during a 1-hour period can exceed 30 percent.
3. Option 2: PM limit not subject to the NSPS for PM.	PM emissions must not exceed 1.0 kg/1,000 kg (1.0 lb/1,000 lb) of coke burn-off in the catalyst regenerator.	Determining and recording each day the average coke burn-off rate (thousands of kilograms per hour) and the hours of operation for each catalyst regenerator by Equation 1 of §63.1564 (you can use process data to determine the volumetric flow rate); and maintaining the PM emission rate below 1.0 kg/1,000 kg (1.0 lb/1,000 lb) of coke burn-off.
5. Option 4: Ni lb/1,000 lbs of coke burn-off not subject to the NSPS for PM.	Ni emissions must not exceed 1.0 mg/kg (0.001 lb/1,000 lbs) of coke burn-off in the catalyst regenerator.	Determining and recording each day the average coke burn-off rate (thousands of kilograms per hour) and the hours of operation for each catalyst regenerator by Equation 1 of §63.1564 (you can use process data to determine the volumetric flow rate); and maintaining Ni emission rate below 1.0 mg/kg (0.001 lb/1,000 lbs) of coke burn-off in the catalyst regenerator.

■ 17. Table 7 to subpart UUU of part 63 is revised to read as follows:

TABLE 7 TO SUBPART UUU OF PART 63.—CONTINUOUS COMPLIANCE WITH OPERATING LIMITS FOR METAL HAP EMISSIONS FROM CATALYTIC CRACKING UNITS

[As stated in § 63.1564(c)(1), you shall meet each requirement in the following table that applies to you.]

For each new or existing catalytic cracking unit . . .	If you use . . .	For this operating limit . . .	You shall demonstrate continuous compliance by . . .
1. Subject to NSPS for PM in 40 CFR 60.102.	Continuous opacity monitoring system.	Not applicable.	Complying with Table 6 of this subpart.
2. Option 1: Elect NSPS not subject to the NSPS for PM in 40 CFR 60.102.	Continuous opacity monitoring system.	Not applicable.	Complying with Table 6 of this subpart.
3. Option 2: PM limit not subject to the NSPS for PM in 40 CFR 60.102.	a. Continuous opacity monitoring system.	The opacity of emissions from your catalyst regenerator vent must not exceed the site-specific opacity operating limit established during the performance test.	Collecting the hourly average continuous opacity monitoring system data according to § 63.1572; and maintaining the hourly average opacity at or below the site-specific limit.
	b. Continuous parameter monitoring systems—electrostatic precipitator.	i. The daily average gas flow rate entering or exiting the control device must not exceed the operating limit established during the performance test.	Collecting the hourly and daily average gas flow rate monitoring data according to § 63.1572 <sup>1</sup> ; and maintaining the daily average gas flow rate at or below the limit established during the performance test.
		ii. The daily average voltage and secondary current (or total power input) to the control device must not fall below the operating limit established during the performance test.	Collecting the hourly and daily average voltage and secondary current (or total power input) monitoring data according to § 63.1572; and maintaining the daily average voltage and secondary current (or total power input) at or above the limit established during the performance test.
	c. Continuous parameter monitoring systems—wet scrubber.	i. The daily average pressure drop across the scrubber must not fall below the operating limit established during the performance test.	Collecting the hourly and daily average pressure drop monitoring data according to § 63.1572; and maintaining the daily average pressure drop above the limit established during the performance test.
		ii. The daily average liquid-to-gas ratio must not fall below the operating limit established during the performance test.	Collecting the hourly average gas flow rate and water (or scrubbing liquid) flow rate monitoring data according to § 63.1572 <sup>1</sup> ; determining and recording the hourly average liquid-to-gas ratio; determining and recording the daily average liquid-to-gas ratio; and maintaining the daily average liquid-to-gas ratio above the limit established during the performance test.
4. Option 3: Ni lb/hr not subject to the NSPS for PM in 40 CFR 60.102.	a. Continuous opacity monitoring system.	The daily average Ni operating value must not exceed the site-specific Ni operating limit established during the performance test.	Collecting the hourly average continuous opacity monitoring system data according to § 63.1572; determining and recording equilibrium catalyst Ni concentration at least once a week <sup>2</sup> ; collecting the hourly average gas flow rate monitoring data according to § 63.1572 <sup>1</sup> ; determining and recording the hourly average Ni operating value using Equation 11 of § 63.1564; determining and recording the daily average Ni operating value; and maintaining the daily average Ni operating value below the site-specific Ni operating limit established during the performance test.

TABLE 7 TO SUBPART UUU OF PART 63.—CONTINUOUS COMPLIANCE WITH OPERATING LIMITS FOR METAL HAP EMISSIONS FROM CATALYTIC CRACKING UNITS—Continued

[As stated in § 63.1564(c)(1), you shall meet each requirement in the following table that applies to you.]

For each new or existing catalytic cracking unit . . .	If you use . . .	For this operating limit . . .	You shall demonstrate continuous compliance by . . .
	<p>b. Continuous parameter monitoring systems—electrostatic precipitator.</p>	<p>i. The daily average gas flow rate entering or exiting the control device must not exceed the operating limit established during the performance test.</p> <p>ii. The daily average voltage and secondary current (or total power input) must not fall below the level established in the performance test.</p> <p>iii. The monthly rolling average of the equilibrium catalyst Ni concentration must not exceed the level established during the performance test.</p>	<p>See item 3.b.i. of this table.</p> <p>See item 3.b.ii. of this table.</p> <p>Determining and recording the equilibrium catalyst Ni concentration at least once a week<sup>2</sup>; determining and recording the monthly rolling average of the equilibrium catalyst Ni concentration once each week using the weekly or most recent value; and maintaining the monthly rolling average below the limit established in the performance test.</p>
	<p>c. Continuous parameter monitoring systems—wetscrubber.</p>	<p>i. The daily average pressure drop must not fall below the operating limit established in the performance test.</p> <p>ii. The daily average liquid-to-gas ratio must not fall below the operating limit established during the performance test.</p> <p>iii. The monthly rolling average equilibrium catalyst Ni concentration must not exceed the level established during the performance test.</p>	<p>See item 3.c.i. of this table.</p> <p>See item 3.c.ii. of this table.</p> <p>Determining and recording the equilibrium catalyst Ni concentration at least once a week<sup>2</sup>; determining and recording the monthly rolling average of equilibrium catalyst Ni concentration once each week using the weekly or most recent value; and maintaining the monthly rolling average below the limit established in the performance test.</p>
<p>5. Option 4: Ni lb/ton of coke burn-off not subject to the NSPS for PM in 40 CFR 60.102.</p>	<p>a. Continuous opacity monitoring system.</p>	<p>The daily average Ni operating value must not exceed the site-specific Ni operating limit established during the performance test.</p>	<p>Collecting the hourly average continuous opacity monitoring system data according to § 63.1572; collecting the hourly average gas flow rate monitoring data according to § 63.1572<sup>1</sup>; determining and recording equilibrium catalyst Ni concentration at least once a week<sup>2</sup>; determining and recording the hourly average Ni operating value using Equation 12 of § 63.1564; determining and recording the daily average Ni operating value; and maintaining the daily average Ni operating value below the site-specific Ni operating limit established during the performance test.</p>
	<p>b. Continuous parameter monitoring systems—electrostatic precipitator.</p>	<p>i. The daily average gas flow rate to the control device must not exceed the level established in the performance test.</p>	<p>See item 3.b.i. of this table.</p>

TABLE 7 TO SUBPART UUU OF PART 63.—CONTINUOUS COMPLIANCE WITH OPERATING LIMITS FOR METAL HAP EMISSIONS FROM CATALYTIC CRACKING UNITS—Continued

[As stated in § 63.1564(c)(1), you shall meet each requirement in the following table that applies to you.]

For each new or existing catalytic cracking unit . . .	If you use . . .	For this operating limit . . .	You shall demonstrate continuous compliance by . . .
	c. Continuous parameter monitoring systems—wet scrubber.	ii. The daily average voltage and secondary current (or total power input) must not fall below the level established in the performance test. iii. The monthly rolling average equilibrium catalyst Ni concentration must not exceed the level established during the performance test. i. The daily average pressure drop must not fall below the operating limit established in the performance test. ii. The daily average liquid-to-gas ratio must not fall below the operating limit established during the performance test. iii. The monthly rolling average equilibrium catalyst Ni concentration must not exceed the level established during the performance test.	See item 3.b.ii. of this table.  See item 4.b.iii. of this table.  See item 3.c.i. of this table.  See item 3.c.ii. of this table.  See item 4.c.iii. of this table.

<sup>1</sup> If applicable, you can use the alternative in § 63.1573(a)(1) for gas flow rate instead of a continuous parameter monitoring system if you used the alternative method in the initial performance test.

<sup>2</sup> The equilibrium catalyst Ni concentration must be measured by the procedure, Determination of Metal Concentration on Catalyst Particles (Instrumental Analyzer Procedure) in appendix A to this subpart; or by EPA Method 6010B, Inductively Coupled Plasma-Atomic Emission Spectrometry, EPA Method 6020, Inductively Coupled Plasma-Mass Spectrometry, EPA Method 7520, Nickel Atomic Absorption, Direct Aspiration, or EPA Method 7521, Nickel Atomic Absorption, Direct Aspiration; or by an alternative to EPA Method 6010B, 6020, 7520, or 7521 satisfactory to the Administrator. The EPA Methods 6010B, 6020, 7520, and 7521 are included in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, Revision 5 (April 1998). The SW-846 and Updates (document number 955-001-00000-1) are available for purchase from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, (202) 512-1800; and from the National Technical Information Services (NTIS), 5285 Port Royal Road, Springfield, VA 22161, (703) 487-4650. Copies may be inspected at the EPA Docket Center (Air Docket), EPA West, Room B-108, 1301 Constitution Ave., NW., Washington, DC; or at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC. These methods are also available at <http://www.epa.gov/epaoswer/hazwaste/test/main.htm>.

- 18. Table 15 to subpart UUU of part 63 is amended by revising the heading in column 1 and 2 and by revising entry 2 as follows:

TABLE 15 TO SUBPART UUU OF PART 63.—ORGANIC HAP EMISSION LIMITS FOR CATALYTIC REFORMING UNITS

For each applicable process vent for a new or existing catalytic reforming unit . . .	You shall meet this emission limit during initial catalyst depressuring and catalyst purging operations . . .
2. Option 2 .....	Reduce uncontrolled emissions of total organic compounds (TOC) or nonmethane TOC from your process vent by 98 percent by weight using a control device or to a concentration of 20 ppmv (dry basis as hexane), corrected to 3 percent oxygen, whichever is less stringent. If you vent emissions to a boiler or process heater to comply with the percent reduction or concentration emission limitation, the vent stream must be introduced into the flame zone, or any other location that will achieve the percent reduction or concentration standard.

- 19. Table 16 to subpart UUU of part 63 is amended by revising the heading in column 3 and by revising entry 2 as follows:

TABLE 16 TO SUBPART UUU OF PART 63.—OPERATING LIMITS FOR ORGANIC HAP EMISSIONS FROM CATALYTIC REFORMING UNITS

*	*	*	*	*
For each new or existing catalytic reforming unit . . .	For this type of control device . . .	You shall meet this operating limit during initial catalyst depressuring and purging operations . . .		
2. Option 2: Percent reduction or concentration limit.	a. Thermal incinerator, boiler or process heater with a design heat input capacity under 44 MW, or boiler or process heater in which all vent streams are not introduced into the flame zone. b. No control device .....	The daily average combustion zone temperature must not fall below the limit established during the performance test.  Operate at all times according to your operation, maintenance, and monitoring plan regarding minimum catalyst purging conditions that must be met prior to allowing uncontrolled purge releases.		

■ 20. Table 17 to subpart UUU of part 63 is amended by revising the heading in column 1 as follows:

TABLE 17 TO SUBPART UUU OF PART 63.—CONTINUOUS MONITORING SYSTEMS FOR ORGANIC HAP EMISSIONS FROM CATALYTIC REFORMING UNITS

*	*	*	*	*	*	*
For each applicable process vent for a new or existing catalytic reforming unit . . .	If you use this type of control device . . .	You shall install and operate this type of continuous monitoring system . . .				

■ 21. Table 18 to subpart UUU of part 63 is amended by revising entry 1 and 2 as follows:

TABLE 18 TO SUBPART UUU OF PART 63.—REQUIREMENTS FOR PERFORMANCE TESTS FOR ORGANIC HAP EMISSIONS FROM CATALYTIC REFORMING UNITS

*	*	*	*	*	*	*
For each new or existing catalytic reforming unit . . .	You shall . . .	Using . . .	According to these requirements . . .			
1. Option 1: Vent to a flare .....	a. Conduct visible emission observations.  b. Determine that the flare meets the requirements for net heating value of the gas being combusted and exit velocity.	Method 22 (40 CFR part 60, appendix A).  Not applicable.	2-hour observation period. Record the presence of a flame at the pilot light over the full period of the test.  40 CFR 63.11(b)(6) through (8).			
2. Option 2: Percent reduction or concentration limit.	a. Select sampling site .....  b. Measure gas volumetric flow rate.	Method 1 or 1A (40 CFR part 60, appendix A). No traverse site selection method is needed for vents smaller than 0.10 meter in diameter.  Method 2, 2A, 2C, 2D, 2F, or 2G (40 CFR part 60, appendix A), as applicable.	Sampling sites must be located at the inlet (if you elect the emission reduction standard) and outlet of the control device and prior to any releases to the atmosphere.			

TABLE 18 TO SUBPART UUU OF PART 63.—REQUIREMENTS FOR PERFORMANCE TESTS FOR ORGANIC HAP EMISSIONS FROM CATALYTIC REFORMING UNITS—Continued

For each new or existing catalytic reforming unit . . .	You shall . . .	Using . . .	According to these requirements . . .
	<p>c. Measure TOC concentration (for percent reduction standard).</p> <p>d. Calculate TOC or nonmethane TOC emission rate and mass emission reduction.</p> <p>e. For concentration standard, measure TOC concentration. (Optional: Measure methane concentration.)</p> <p>f. Determine oxygen content in the gas stream at the outlet of the control device.</p> <p>g. Calculate the TOC or nonmethane TOC concentration corrected for oxygen content (for concentration standard).</p> <p>h. Establish each operating limit in Table 16 of this subpart that applies to you for a thermal incinerator, or process heater or boiler with a design heat input capacity under 44 MW, or process heater or boiler in which all vent streams are not introduced into flame zone.</p> <p>i. If you do not use a control device, document the purging conditions used prior to testing following the minimum requirements in the operation, maintenance, and monitoring plan.</p>	<p>Method 25 (40 part 60, appendix A) to measure nonmethane TOC concentration (in carbon equivalents) at inlet and outlet of the control device. If the nonmethane TOC outlet concentration is expected to be less than 50 ppm (as carbon), you can use Method 25A to measure TOC concentration (as hexane) at the inlet and the outlet of the control device. If you use Method 25A, you may use Method 18 (40 CFR part 60, appendix A) to measure the methane concentration to determine the nonmethane TOC concentration.</p> <p>Method 25A (40 CFR part 60, appendix A) to measure TOC concentration (as hexane) at the outlet of the control device. You may elect to use Method 18 (40 CFR part 60, appendix A) to measure the methane concentration.</p> <p>Method 3A or 3B (40 CFR part 60, appendix A), as applicable.</p> <p>Equation 4 of § 63.1566.</p> <p>Data from the continuous parameter monitoring systems.</p> <p>Data from monitoring systems as identified in the operation, maintenance, and monitoring plan.</p>	<p>Take either an integrated sample or four grab samples during each run. If you use a grab sampling technique, take the samples at approximately equal intervals in time, such as 15-minute intervals during the run.</p> <p>Calculate emission rate by Equation 1 of § 63.1566 (if you use Method 25) or Equation 2 of § 63.1566 (if you use Method 25A). Calculate mass emission reduction by Equation 3 of § 63.1566.</p> <p>Collect the temperature monitoring data every 15 minutes during the entire period of the initial TOC performance test. Determine and record the minimum hourly average combustion zone temperature.</p> <p>Procedures in the operation, maintenance, and monitoring plan.</p>

■ 22. Table 19 to subpart UUU of part 63 is revised as follows:



TABLE 19 TO SUBPART UUU OF PART 63.—INITIAL COMPLIANCE WITH ORGANIC HAP EMISSION LIMITS FOR CATALYTIC REFORMING UNITS

[As stated in § 63.1566(b)(7), you shall meet each requirement in the following table that applies to you.]

For each applicable process vent for a new or existing catalytic reforming unit . . .	For the following emission limit . . .	You have demonstrated initial compliance if . . .
Option 1 .....	Visible emissions from a flare must not exceed a total of 5 minutes during any 2 consecutive hours.	Visible emissions, measured using Method 22 over the 2-hour observation period of the performance test, do not exceed a total of 5 minutes.
Option 2 .....	Reduce uncontrolled emissions of total organic compounds (TOC) or nonmethane TOC from your process vent by 98 percent by weight using a control device or to a concentration of 20 ppmv (dry basis as hexane), corrected to 3 percent oxygen, whichever is less stringent.	The mass emission reduction of nonmethane TOC measured by Method 25 over the period of the performance test is at least 98 percent by weight as calculated using Equations 1 and 3 of § 63.1566; or the mass emission reduction of TOC measured by Method 25A (or nonmethane TOC measured by Methods 25A and 18) over the period of the performance test is at least 98 percent by weight as calculated using Equations 2 and 3 of § 63.1566; or the TOC concentration measured by Method 25A (or the nonmethane TOC concentration measured by Methods 25A and 18) over the period of the performance test does not exceed 20 ppmv (dry basis as hexane) corrected to 3 percent oxygen as calculated using Equation 4 of § 63.1566.

■ 23. Table 20 to subpart UUU of part 63 is revised as follows:

TABLE 20 TO SUBPART UUU OF PART 63.—CONTINUOUS COMPLIANCE WITH ORGANIC HAP EMISSION LIMITS FOR CATALYTIC REFORMING UNITS

[As stated in § 63.1566(c)(1), you shall meet each requirement in the following table that applies to you.]

For each applicable process vent for a new or existing catalytic reforming unit . . .	For this emission limit . . .	You shall demonstrate continuous compliance during initial catalyst depressuring and catalyst purging operations by . . .
1. Option 1 .....	Vent emissions from your process vent to a flare that meets the requirements in § 63.11(b).	Maintaining visible emissions from a flare below a total of 5 minutes during any 2 consecutive hours.
2. Option 2 .....	Reduce uncontrolled emissions of total organic compounds (TOC) or nonmethane TOC from your process vent by 98 percent by weight using a control device or to a concentration of 20 ppmv (dry basis as hexane), corrected to 3 percent oxygen, whichever is less stringent.	Maintaining a 98 percent by weight emission reduction of TOC or nonmethane TOC; or maintaining a TOC or nonmethane TOC concentration of not more than 20 ppmv (dry basis as hexane), corrected to 3 percent oxygen, whichever is less stringent.

■ 24. Table 21 to Subpart UUU of part 63 is revised as follows:

TABLE 21 TO SUBPART UUU OF PART 63.—CONTINUOUS COMPLIANCE WITH OPERATING LIMITS FOR ORGANIC HAP EMISSIONS FROM CATALYTIC REFORMING UNITS

[As stated in § 63.1566(c)(1), you shall meet each requirement in the following table that applies to you.]

For each applicable process vent for a new or existing catalytic reforming unit . . .	If you use . . .	For this operating limit . . .	You shall demonstrate continuous compliance during initial catalyst depressuring and purging operations by . . .
1. Option 1 .....	Flare that meets the requirements in § 63.11(b).	The flare pilot light must be present at all times and the flare must be operating at all times that emissions may be vented to it.	Collecting flare monitoring data according to § 63.1572; and recording for each 1-hour period whether the monitor was continuously operating and the pilot light was continuously present during each 1-hour period.

TABLE 21 TO SUBPART UUU OF PART 63.—CONTINUOUS COMPLIANCE WITH OPERATING LIMITS FOR ORGANIC HAP EMISSIONS FROM CATALYTIC REFORMING UNITS—Continued

[As stated in § 63.1566(c)(1), you shall meet each requirement in the following table that applies to you.]

For each applicable process vent for a new or existing catalytic reforming unit . . .	If you use . . .	For this operating limit . . .	You shall demonstrate continuous compliance during initial catalyst depressuring and purging operations by . . .
2. Option 2 .....	<p>a. Thermal incinerator boiler or process heater with a design input capacity under 44 MW or boiler or process heater in which not all vent streams are not introduced into the flame zone.</p> <p>b. No control device .....</p>	<p>Maintain the daily average combustion zone temperature above the limit established during the performance test.</p> <p>Operate at all times according to your operation, maintenance, and monitoring plan regarding minimum purging conditions that must be met prior to allowing uncontrolled purge releases.</p>	<p>Collecting, the hourly and daily temperature monitoring data according to §63.1572; and maintaining the daily average combustion zone temperature above the limit established during the performance test.</p> <p>Recording information to document compliance with the procedures in your operation, maintenance, and monitoring plan.</p>

■ 25. Table 22 to subpart UUU of part 63 is revised as follows:

TABLE 22 TO SUBPART UUU OF PART 63.—INORGANIC HAP EMISSION LIMITS FOR CATALYTIC REFORMING UNITS

[As stated in § 63.1567(a)(1), you shall meet each emission limitation in the following table that applies to you.]

For . . .	You shall meet this emission limit for each applicable catalytic reforming unit process vent during coke burn-off and catalyst rejuvenation . . .
1. Each existing semi-regenerative catalytic reforming unit .....	Reduce uncontrolled emissions of hydrogen chloride (HCl) by 92 percent by weight or to a concentration of 30 ppmv (dry basis), corrected to 3 percent oxygen.
2. Each existing cyclic or continuous catalytic reforming unit .....	Reduce uncontrolled emissions of HCl by 97 percent by weight or to a concentration of 10 ppmv (dry basis), corrected to 3 percent oxygen.
3. Each new semi-regenerative, cyclic, or continuous catalytic reforming unit.	Reduce uncontrolled emissions of HCl by 97 percent by weight or to a concentration of 10 ppmv (dry basis), corrected to 3 percent oxygen.

■ 26. Table 23 to subpart UUU of part 63 is revised as follows:

TABLE 23 TO SUBPART UUU OF PART 63.—OPERATING LIMITS FOR INORGANIC HAP EMISSIONS FROM CATALYTIC REFORMING UNITS

[As stated in § 63.1567(a)(2), you shall meet each operating limit in the following table that applies to you.]

For each applicable process vent for a new or existing catalytic reforming unit with this type of control device . . .	You shall meet this operating limit during coke burn-off and catalyst rejuvenation . . .
1. Wet scrubber .....	The daily average pH or alkalinity of the water (or scrubbing liquid) exiting the scrubber must not fall below the limit established during the performance test; and the daily average liquid-to-gas ratio must not fall below the limit established during the performance test.
2. Internal scrubbing system or no control device (e.g., hot regen system) meeting outlet HCl concentration limit.	The daily average HCl concentration in the catalyst regenerator exhaust gas must not exceed the limit established during the performance test.
3. Internal scrubbing system meeting HCl percent reduction standard.	The daily average pH or alkalinity of the water (or scrubbing liquid) exiting the internal scrubbing system must not fall below the limit established during the performance test; and the daily average liquid-to-gas ratio must not fall below the limit established during the performance test.
4. Fixed-bed gas-solid adsorption system .....	The daily average temperature of the gas entering or exiting the adsorption system must not exceed the limit established during the performance test; and the HCl concentration in the adsorption system exhaust gas must not exceed the limit established during the performance test.

TABLE 23 TO SUBPART UUU OF PART 63.—OPERATING LIMITS FOR INORGANIC HAP EMISSIONS FROM CATALYTIC REFORMING UNITS—Continued

[As stated in § 63.1567(a)(2), you shall meet each operating limit in the following table that applies to you.]

For each applicable process vent for a new or existing catalytic reforming unit with this type of control device . . .	You shall meet this operating limit during coke burn-off and catalyst rejuvenation . . .
5. Moving-bed gas-solid adsorption system (e.g., Chlorsorb™ System).	The daily average temperature of the gas entering or exiting the adsorption system must not exceed the limit established during the performance test; and the weekly average chloride level on the sorbent entering the adsorption system must not exceed the design or manufacturer's recommended limit (1.35 weight percent for the Chlorsorb™ System); and the weekly average chloride level on the sorbent leaving the adsorption system must not exceed the design or manufacturer's recommended limit (1.8 weight percent for the Chlorsorb™ System).

■ 27. Table 24 to subpart UUU of part 63 is revised as follows:

TABLE 24 TO SUBPART UUU OF PART 63.—CONTINUOUS MONITORING SYSTEMS FOR INORGANIC HAP EMISSIONS FROM CATALYTIC REFORMING UNITS

[As stated in § 63.1567(b)(1), you shall meet each requirement in the following table that applies to you.]

If you use this type of control device for your vent . . .	You shall install and operate this type of continuous monitoring system . . .
1. Wet scrubber .....	Continuous parameter monitoring system to measure and record the total water (or scrubbing liquid) flow rate entering the scrubber during coke burn-off and catalyst rejuvenation; and continuous parameter monitoring system to measure and record gas flow rate entering or exiting the scrubber during coke burn-off and catalyst rejuvenation <sup>1</sup> ; and continuous parameter monitoring system to measure and record the pH or alkalinity of the water (or scrubbing liquid) exiting the scrubber during coke burn-off and catalyst rejuvenation. <sup>2</sup>
2. Internal scrubbing system or no control device (e.g., hot regen system) to meet HC1 outlet concentration limit.	Colormetric tube sampling system to measure the HC1 concentration in the catalyst regenerator exhaust gas during coke burn-off and catalyst rejuvenation. The colormetric tube sampling system must meet the requirements in Table 41 of this subpart.
3. Internal scrubbing system to meet HC1 percent reduction standard ..	Continuous parameter monitoring system to measure and record the gas flow rate entering or exiting the internal scrubbing system during coke burn-off and catalyst rejuvenation; and continuous parameter monitoring system to measure and record the total water (or scrubbing liquid) flow rate entering the internal scrubbing system during coke burn-off and catalyst rejuvenation; and continuous parameter monitoring system to measure and record the pH or alkalinity of the water (or scrubbing liquid) exiting the internal scrubbing system during coke burn-off and catalyst rejuvenation. <sup>2</sup>
4. Fixed-bed gas-solid adsorption system .....	Continuous parameter monitoring system to measure and record the temperature of the gas entering or exiting the adsorption system during coke burn-off and catalyst rejuvenation; and colormetric tube sampling system to measure the gaseous HC1 concentration in the adsorption system exhaust and at a point within the absorbent bed not to exceed 90 percent of the total length of the absorbent bed during coke burn-off and catalyst rejuvenation. The colormetric tube sampling system must meet the requirements in Table 41 of this subpart.
5. Moving-bed gas-solid adsorption system (e.g., Chlorsorb™ System).	Continuous parameter monitoring system to measure and record the temperature of the gas entering or exiting the adsorption system during coke burn-off and catalyst rejuvenation.

<sup>1</sup> If applicable, you can use the alternative in § 63.1573 (a)(1) instead of a continuous parameter monitoring system for gas flow rate or instead of a continuous parameter monitoring system for the cumulative volume of gas.

<sup>2</sup> If applicable, you can use the alternative in § 63.1573(b)(1) instead of a continuous parameter monitoring system for pH of the water (or scrubbing liquid) or the alternative in § 63.1573(b)(2) instead of a continuous parameter monitoring system for alkalinity of the water (or scrubbing liquid).

■ 28. Table 25 to subpart UUU of part 63 is revised as follows:

TABLE 25 TO SUBPART UUU OF PART 63.—REQUIREMENTS FOR PERFORMANCE TESTS FOR INORGANIC HAP EMISSIONS FOR CATALYTIC REFORMING UNITS

[As stated in § 63.1567(b)(2) and (3), you shall meet each requirement in the following table that applies to you.]

For each new and existing catalytic reforming unit using . . .	You shall . . .	Using . . .	According to these requirements . . .
1. Any or no control system	<p>a. Select sampling port location(s) and the number of traverse points.</p> <p>b. Determine velocity and volumetric flow rate.</p> <p>c. Conduct gas molecular weight analysis.</p> <p>d. Measure moisture content of the stack gas.</p> <p>e. Measure the HCl concentration at the selected sampling locations.</p>	<p>Method 1 or 1A (40 CFR part 60, appendix A), as applicable.</p> <p>Method 2, 2A, 2C, 2D, 2F, or 2G (40 CFR part 60, appendix A), as applicable.</p> <p>Method 3, 3A, or 3B (40 CFR part 60, appendix A), as applicable.</p> <p>Method 4 (40 CFR part 60, appendix A).</p> <p>Method 26 or 26A (40 CFR part 60, appendix A). If your control device is a wet scrubber or internal scrubbing system, you must use Method 26A.</p>	<p>(1) If you operate a control device and you elect to meet an applicable HCl percent reduction standard, sampling sites must be located at the inlet of the control device or internal scrubbing system and at the outlet of the control device or internal scrubber system prior to any release to the atmosphere. For a series of fixed-bed systems, the outlet sampling site should be located at the outlet of the first fixed-bed, prior to entering the second fixed-bed in the series.</p> <p>(2) If you elect to meet an applicable HCl outlet concentration limit, locate sampling sites at the outlet of the control device or internal scrubber system prior to any release to the atmosphere. For a series of fixed-bed systems, the outlet sampling site should be located at the outlet of the first fixed-bed, prior to entering the second fixed-bed in the series. If there is no control device, locate sampling sites at the outlet of the catalyst regenerator prior to any release to the atmosphere.</p> <p>(1) For semi-regenerative and cyclic regeneration units, conduct the test during the coke burn-off and catalyst rejuvenation cycle, but collect no samples during the first hour or the last 6 hours of the cycle (for semi-regenerative units) or during the first hour or the last 2 hours of the cycle (for cyclic regeneration units). For continuous regeneration units, the test should be conducted no sooner than 3 days after process unit or control system start up.</p> <p>(2) Determine and record the HCl concentration corrected to 3 percent oxygen (using Equation 1 of § 63.1567) for each sampling location for each test run.</p> <p>(3) Determine and record the percent emission reduction, if applicable, using Equation 3 of § 63.1567 for each test run.</p> <p>(4) Determine and record the average HCl concentration (corrected to 3 percent oxygen) and the average percent emission reduction, if applicable, for the overall source test from the recorded test run values.</p>
2. Wet scrubber	<p>a. Establish operating limit for pH level or alkalinity.</p>	<p>i. Data from continuous parameter monitoring systems.</p> <p>ii. Alternative pH procedure in § 63.1573 (b)(1).</p>	<p>Measure and record the pH or alkalinity of the water (or scrubbing liquid) exiting scrubber every 15 minutes during the entire period of the performance test. Determine and record the minimum hourly average pH or alkalinity level from the recorded values.</p> <p>Measure and record the pH of the water (or scrubbing liquid) exiting the scrubber during coke burn-off and catalyst rejuvenation using pH strips at least three times during each test run. Determine and record the average pH level for each test run. Determine and record the minimum test run average pH level.</p>

TABLE 25 TO SUBPART UUU OF PART 63.—REQUIREMENTS FOR PERFORMANCE TESTS FOR INORGANIC HAP EMISSIONS FOR CATALYTIC REFORMING UNITS—Continued

[As stated in § 63.1567(b)(2) and (3), you shall meet each requirement in the following table that applies to you.]

For each new and existing catalytic reforming unit using . . .	You shall . . .	Using . . .	According to these requirements . . .
	b. Establish operating limit for liquid-to-gas ratio.	iii. Alternative alkalinity method in § 63.1573(b)(2).  i. Data from continuous parameter monitoring systems.  ii. Alternative procedure for gas flow rate in § 63.1573(a)(1).	Measure and record the alkalinity of the water (or scrubbing liquid) exiting the scrubber during coke burn-off and catalyst rejuvenation using discrete titration at least three times during each test run. Determine and record the average alkalinity level for each test run. Determine and record the minimum test run average alkalinity level.  Measure and record the gas flow rate entering or exiting the scrubber and the total water (or scrubbing liquid) flow rate entering the scrubber every 15 minutes during the entire period of the performance test. Determine and record the hourly average gas flow rate and total water (or scrubbing liquid) flow rate. Determine and record the minimum liquid-to-gas ratio from the recorded, paired values.  Collect air flow rate monitoring data or determine the air flow rate using control room instruments every 15 minutes during the entire period of the initial performance test. Determine and record the hourly average rate of all the readings. Determine and record the maximum gas flow rate using Equation 1 of § 63.1573.
3. Internal scrubbing system or no control device (e.g., hot regen system) meeting HCl outlet concentration limit.	Establish operating limit for HCl concentration.	Data from continuous parameter monitoring system.	Measure and record the HCl concentration in the catalyst regenerator exhaust gas using the colorimetric tube sampling system at least three times during each test run. Determine and record the average HCl concentration for each test run. Determine and record the average HCl concentration for the overall source test from the recorded test run averages. Determine and record the operating limit for HCl concentration using Equation 4 of § 63.1567.
4. Internal scrubbing system meeting HCl percent reduction standard.	a. Establish operating limit for pH level or alkalinity.	i. Data from continuous parameter monitoring system.  ii. Alternative pH method in § 63.1573(b)(1).	Measure and record the pH alkalinity of the water (or scrubbing liquid) exiting the internal scrubbing system every 15 minutes during the entire period of the performance test. Determine and record the minimum hourly average pH or alkalinity level from the recorded values.  Measure and in record pH of the water (or scrubbing liquid) exiting the internal scrubbing system during coke burn-off and catalyst rejuvenation using pH strips at least three times during each test run. Determine and record the average pH level for each test run. Determine and record the minimum test run average pH level.
	b. Establish operating limit for liquid-to-gas ratio.	iii. Alternative alkalinity method in § 63.1573(b)(2).  Data from continuous parameter monitoring systems.	Measure and record the alkalinity water (or scrubbing liquid) exiting the internal scrubbing system during coke burn-off and catalyst rejuvenation using discrete titration at least three times during each test run. Determine and record the average alkalinity level for each test run. Determine and record the minimum test run average alkalinity level.  Measure and record the gas entering or exiting the internal scrubbing system and the total water (or scrubbing liquid) flow rate entering the internal scrubbing system every 15 minutes during the entire period of the performance test. Determine and record the hourly average gas flow rate and total water (or scrubbing liquid) flow rate. Determine and record the minimum liquid-to-gas ratio from the recorded, paired values.
5. Fixed-bed gas-solid adsorption system. Gas-solid.	a. Establish operating limit for temperature.	Data from continuous parameter monitoring system.	Measure and record the temperature of gas entering or exiting the adsorption system every 15 minutes. Determine and record the maximum hourly average temperature.

TABLE 25 TO SUBPART UUU OF PART 63.—REQUIREMENTS FOR PERFORMANCE TESTS FOR INORGANIC HAP EMISSIONS FOR CATALYTIC REFORMING UNITS—Continued

[As stated in § 63.1567(b)(2) and (3), you shall meet each requirement in the following table that applies to you.]

For each new and existing catalytic reforming unit using . . .	You shall . . .	Using . . .	According to these requirements . . .
6. Moving-bed gas-solid adsorption system (e.g., Chlorsorb™ System).	b. Establish operating limit for HCl concentration.	i. Data from continuous parameter monitoring systems.	(1) Measure and record the HCl concentration in the exhaust gas from the fixed-bed adsorption system using the colorimetric tube sampling system at least three times during each test run. Determine and record the average HCl concentration for each test run. Determine and record the average HCl concentration for the overall source test from the recorded test run averages. (2) If you elect to comply with the HCl outlet concentration limit (Option 2), determine and record the operating limit for HCl concentration using Equation 4 of § 63.1567. If you elect to comply with the HCl percent reduction standard (Option 1), determine and record the operating limit for HCl concentration using Equation 5 of § 63.1567.
	a. Establish operating limit for temperature.  b. Measure the chloride level on the sorbent entering and exiting the adsorption system.	Data from continuous parameter monitoring systems.  Determination of Metal Concentration on Catalyst Particles (Instrumental Analyzer Procedure) in appendix A to subpart UUU; or EPA Method 5050 combined either with EPA Method 9056, or with EPA Method 9253; or EPA Method 9212 with the soil extraction procedures listed within the method. <sup>1</sup>	Measure and record the temperature of gas entering or exiting the adsorption system every 15 minutes. Determine and record the maximum hourly average temperature.  Measure and record the chloride concentration of the sorbent material entering and exiting the adsorption system at least three times during each test run. Determine and record the average weight percent chloride concentration of the sorbent entering the adsorption system for each test run. Determine and record the average weight percent chloride concentration of the sorbent exiting the adsorption system for each test run.

<sup>1</sup> The EPA Methods 5050, 9056, 9212 and 9253 are included in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, Revision 5 (April 1998). The SW-846 and Updates (document number 955-001-00000-1) are available for purchase from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, (202) 512-1800; and from the National Technical Information Services (NTIS), 5285 Port Royal Road, Springfield, VA 22161, (703) 487-4650. Copies may be inspected at the EPA Docket Center (Air Docket), EPA West, Room B-108, 1301 Constitution Ave., NW., Washington, DC; or at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC. These methods are also available at <http://www.epa.gov/epaoswer/hazwaste/test/main.htm>.

■ 29. Table 26 to subpart UUU of part 63 is revised as follows:

TABLE 26 TO SUBPART UUU OF PART 63.—INITIAL COMPLIANCE WITH INORGANIC HAP EMISSION LIMITS FOR CATALYTIC REFORMING UNITS

[As stated in § 63.1567(b)(4), you shall meet each requirement in the following table that applies to you.]

For . . .	For the following emission limit . . .	You have demonstrated initial compliance if . . .
1. Each existing semi-regenerative catalytic reforming unit.	Reduce uncontrolled emissions of HCl by 92 percent by weight or to a concentration of 30 ppmv, (dry basis), corrected to 3 percent oxygen.	Average emissions HCl measured using Method 26 or 26A, as applicable, over the period of the performance test, are reduced by 92 percent or to a concentration less than or equal to 30 ppmv (dry basis) corrected to 3 percent oxygen.
2. Each existing cyclic or continuous catalytic reforming unit and each new semi-regenerative, cyclic, or continuous catalytic reforming unit.	Reduce uncontrolled emissions of HCl by 97 percent by weight or to a concentration of 10 ppmv (dry basis), corrected to 3 percent oxygen.	Average emissions of HCl measured using Method 26 or 26A, as applicable, over the period of the performance test, are reduced by 97 percent or to a concentration less than or equal to 10 ppmv (dry basis) corrected to 3 percent oxygen.

■ 30. Table 27 to subpart UUU of part 63 is revised as follows:

**TABLE 27 TO SUBPART UUU OF PART 63.—CONTINUOUS COMPLIANCE WITH INORGANIC HAP EMISSION LIMITS FOR CATALYTIC REFORMING UNITS**

[As stated in § 63.1567(c)(1), you shall meet each requirement in the following table that applies to you.]

For . . .	For this emission limit . . .	You shall demonstrate continuous compliance during coke burn-off and catalyst rejuvenation by . . .
1. Each existing semi-regenerative catalytic reforming unit.	Reduce uncontrolled emissions of HCl by 92 percent by weight or to a concentration of 30 ppmv (dry basis), corrected to 3 percent oxygen..	Maintaining a 92 percent HCl emission reduction or an HCl concentration no more than 30 ppmv (dry basis), corrected to 3 percent oxygen.
2. Each existing cyclic or continuous catalytic reforming unit.	Reduce uncontrolled emissions of HCl by 97 percent by weight or to a concentration of 10 ppmv (dry basis), corrected to 3 percent oxygen.	Maintaining a 97 percent HCl control efficiency or an HCl concentration no more than 10 ppmv (dry basis), corrected to 3 percent oxygen.
3. Each new semi-regenerative, cyclic, or continuous catalytic reforming unit.	Reduce uncontrolled emissions of HCl by 97 percent by weight or to a concentration of 10 ppmv (dry basis), corrected to 3 percent oxygen.	Maintaining a 97 percent HCl control efficiency or an HCl concentration no more than 10 ppmv (dry basis), corrected to 3 percent oxygen.

■ 31. Table 28 to subpart UUU of part 63 is revised as follows:

**TABLE 28 TO SUBPART UUU OF PART 63.—CONTINUOUS COMPLIANCE WITH OPERATING LIMITS FOR INORGANIC HAP EMISSIONS FROM CATALYTIC REFORMING UNITS**

[As stated in § 63.1567(c)(1), you shall meet each requirement in the following table that applies to you.]

For each new and existing catalytic reforming unit using this type of control device or system . . .	For this operating limit . . .	You shall demonstrate continuous compliance during coke burn-off and catalyst rejuvenation by . . .
1. Wet scrubber .....	<p>a. The daily average pH or alkalinity of the water (or scrubbing liquid) exiting the scrubber must not fall below the level established during the performance test.</p> <p>b. The daily average liquid-to-gas ratio must not fall below the level established during the performance test.</p>	<p>Collecting the hourly and daily average pH or alkalinity monitoring data according to § 63.1572<sup>1</sup>; and maintaining the daily average pH or alkalinity above the operating limit established during the performance test.</p> <p>Collecting the hourly average gas flow rate<sup>2</sup> and total water (or scrubbing liquid) flow rate monitoring data according to § 63.1572; and determining and recording the hourly average liquid-to-gas ratio; and determining and recording the daily average liquid-to-gas ratio; and maintaining the daily average liquid-to-gas ratio above the limit established during the performance test.</p>
2. Internal scrubbing system or no control device (e.g., hot regen system) meeting HCl concentration limit.	The daily average HCl concentration in the catalyst regenerator exhaust gas must not exceed the limit established during the performance test.	Measuring and recording the HCl concentration at least 4 times during a regeneration cycle (equally spaced in time) or every 4 hours, whichever is more frequent, using a colorimetric tube sampling system; calculating the daily average HCl concentration as an arithmetic average of all samples collected in each 24-hour period from the start of the coke burn-off cycle or for the entire duration of the coke burn-off cycle if the coke burn-off cycle is less than 24 hours; and maintaining the daily average HCl concentration below the applicable operating limit.
3. Internal scrubbing system meeting percent HCl reduction standard.	<p>a. The daily average pH or alkalinity of the water (or scrubbing liquid) exiting the internal scrubbing system must not fall below the limit established during the performance test.</p> <p>b. The daily average liquid-to-gas ratio must not fall below the level established during the performance test.</p>	<p>Collecting the hourly and daily average pH or alkalinity monitoring data according to § 63.1572<sup>1</sup> and maintaining the daily average pH or alkalinity above the operating limit established during the performance test.</p> <p>Collecting the hourly average gas flow rate<sup>2</sup> and total water (or scrubbing liquid) flow rate monitoring data according to § 63.1572; and determining and recording the hourly average liquid-to-gas ratio; and determining and recording the daily average liquid-to-gas ratio; and maintaining the daily average liquid-to-gas ratio above the limit established during the performance test.</p>

TABLE 28 TO SUBPART UUU OF PART 63.—CONTINUOUS COMPLIANCE WITH OPERATING LIMITS FOR INORGANIC HAP EMISSIONS FROM CATALYTIC REFORMING UNITS—Continued

[As stated in § 63.1567(c)(1), you shall meet each requirement in the following table that applies to you.]

For each new and existing catalytic reforming unit using this type of control device or system . . .	For this operating limit . . .	You shall demonstrate continuous compliance during coke burn-off and catalyst rejuvenation by . . .
4. Fixed-bed gas-solid adsorption systems.	<p>a. The daily average temperature of the gas entering or exiting the adsorption system must not exceed the limit established during the performance test.</p> <p>b. The HCl concentration in the exhaust gas from the fixed-bed gas-solid adsorption system must not exceed the limit established during the performance test.</p>	<p>Collecting the hourly and daily average temperature monitoring data according to § 63.1572; and maintaining the daily average temperature below the operating limit established during the performance test.</p> <p>Measuring and recording the concentration of HCl weekly or during each regeneration cycle, whichever is less frequent, using a colorimetric tube sampling system at a point within the adsorbent bed not to exceed 90 percent of the total length of the adsorption bed during coke-burn-off and catalyst rejuvenation; implementing procedures in the operating and maintenance plan if the HCl concentration at the sampling location within the adsorption bed exceeds the operating limit; and maintaining the HCl concentration in the gas from the adsorption system below the applicable operating limit.</p>
5. Moving-bed gas-solid adsorption system (e.g., Clorsorb™ System).	<p>a. The daily average temperature of the gas entering or exiting the adsorption system must not exceed the limit established during the performance test.</p> <p>b. The weekly average chloride level on the sorbent entering the adsorption system must not exceed the design or manufacturer's recommended limit (1.35 weight percent for the Clorsorb™).</p> <p>c. The weekly average chloride level on the sorbent exiting the adsorption system must not exceed the design or manufacturer's recommended limit (1.8 weight percent for the Clorsorb™ System).</p>	<p>Collecting the hourly and daily average temperature monitoring data according to § 63.1572; and maintaining the daily average temperature below the operating limit established during the performance test.</p> <p>Collecting samples of the sorbent exiting the adsorption system three times per week (on non-consecutive days); and analyzing the samples for total chloride<sup>3</sup>; and determining and recording the weekly average chloride concentration; and maintaining the chloride concentration below the design or manufacturer's recommended limit (1.35 weight percent for the Clorsorb™ System).</p> <p>Collecting samples of the sorbent exiting the adsorption system three times per week (on non-consecutive days); and analyzing the samples for total chloride concentration; and determining and recording the weekly average chloride concentration; and maintaining the chloride concentration below the design or manufacturer's recommended limit (1.8 weight percent Clorsorb™ System).</p>

<sup>1</sup> If applicable, you can use either alternative in § 63.1573(b) instead of a continuous parameter monitoring system for pH or alkalinity if you used the alternative method in the initial performance test.

<sup>2</sup> If applicable, you can use the alternative in § 63.1573(a)(1) instead of a continuous parameter monitoring system for the gas flow rate or cumulative volume of gas entering or exiting the system if you used the alternative method in the initial performance test.

<sup>3</sup> The total chloride concentration of the sorbent material must be measured by the procedure, "Determination of Metal Concentration on Catalyst Particles (Instrumental Analyzer Procedure)" in appendix A to this subpart; or by using EPA Method 5050, Bomb Preparation Method for Solid Waste, combined either with EPA Method 9056, Determination of Inorganic Anions by Ion Chromatography, or with EPA Method 9253, Chloride (Titrimetric, Silver Nitrate); or by using EPA Method 9212, Potentiometric Determination of Chloride in Aqueous Samples with Ion-Selective Electrode, and using the soil extraction procedures listed within the method. The EPA Methods 5050, 9056, 9212 and 9253 are included in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, Revision 5 (April 1998). The SW-846 and Updates (document number 955-001-00000-1) are available for purchase from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, (202) 512-1800; and from the National Technical Information Services (NTIS), 5285 Port Royal Road, Springfield, VA 22161, (703) 487-4650. Copies may be inspected at the EPA Docket Center (Air Docket), EPA West, Room B-108, 1301 Constitution Ave., NW., Washington, DC; or at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC. These methods are also available at <http://www.epa.gov/epaoswer/hazwaste/test/main.htm>.

■ 32. Table 31 to subpart UUU of part 63 is amended by revising entry 1 and 3 as follows:



TABLE 31 TO SUBPART UUU OF PART 63.—CONTINUOUS MONITORING SYSTEMS FOR HAP EMISSIONS FROM SULFUR RECOVERY UNITS

\* \* \* \* \*

For . . .	For this limit . . .	You shall install and operate this continuous monitoring system . . .
1. Each new or existing Claus sulfur recovery unit part of a sulfur recovery plant of 20 long tons per day or more and subject to the NSPS for sulfur oxides in 40 CFR 60.104(a)(2).	a. 250 ppmv (dry basis) of SO <sub>2</sub> at zero percent excess air if you use an oxidation or reduction control system followed by incineration.  b. 300 ppmv of reduced sulfur compounds calculated as ppmv SO <sub>2</sub> (dry basis) at zero percent excess air if you use a reduction control system without incineration.	Continuous emission monitoring system to measure and record the hourly average concentration of SO <sub>2</sub> (dry basis) at zero percent excess air for each exhaust stack. This system must include an oxygen monitor for correcting the data for excess air.  Continuous emission monitoring system to measure and record the hourly average concentration of reduced sulfur and oxygen (O <sub>2</sub> ) emissions. Calculate the reduced sulfur emissions as SO <sub>2</sub> (dry basis) at zero percent excess air. <i>Exception:</i> You can use an instrument having an air or SO <sub>2</sub> dilution and oxidation system to convert the reduced sulfur to SO <sub>2</sub> for continuously monitoring and recording the concentration (dry basis) at zero percent excess air of the resultant SO <sub>2</sub> instead of the reduced sulfur monitor. The monitor must include an oxygen monitor for correcting the data for excess oxygen.
* * * * * 3. Option 2: TRS limit. Each new or existing sulfur recovery unit (Claus or other type, regardless of size) not subject to the NSPS for sulfur oxides in 40 CFR 60.104(a)(2).	* * * * * 300 ppmv of total reduced sulfur (TRS) compounds, expressed as an equivalent SO <sub>2</sub> concentration (dry basis) at zero percent oxygen.	* * * * * i. Continuous emission monitoring system to measure and record the hourly average concentration of TRS for each exhaust stack; this monitor must include an oxygen monitor for correcting the data for excess oxygen; or ii. Continuous parameter monitoring systems to measure and record the combustion zone temperature of each thermal incinerator and the oxygen content (percent, dry basis) in the vent stream of the incinerator.

■ 33. Table 33 to subpart UUU of part 63 is revised as follows:

TABLE 33 TO SUBPART UUU OF PART 63.—INITIAL COMPLIANCE WITH HAP EMISSION LIMITS FOR SULFUR RECOVERY UNITS

[As stated in § 63.1568(b)(5), you shall meet each requirement in the following table that applies to you.]

For . . .	For the following emission limit . . .	You have demonstrated initial compliance if . . .
1. Each new or existing Claus sulfur recovery unit part of a sulfur recovery plant of 20 long tons per day or more and subject to the NSPS for sulfur oxides in 40 CFR 60.104(a)(2).	a. 250 ppmv (dry basis) SO <sub>2</sub> at zero percent excess air if you use an oxidation or reduction control system followed by incineration.	You have already conducted a performance test to demonstrate initial compliance with the NSPS and each 12-hour rolling average concentration of SO <sub>2</sub> emissions measured by the continuous emission monitoring system is less than or equal to 250 ppmv (dry basis) at zero percent excess air. As part of the Notification of Compliance Status, you must certify that your vent meets the SO <sub>2</sub> limit. You are not required to do another performance test to demonstrate initial compliance. You have already conducted a performance evaluation to demonstrate initial compliance with the applicable performance specification. As part of your Notification of Compliance Status, you must certify that your continuous emission monitoring system meets the applicable requirements in § 63.1572. You are not required to do another performance evaluation to demonstrate initial compliance.

TABLE 33 TO SUBPART UUU OF PART 63.—INITIAL COMPLIANCE WITH HAP EMISSION LIMITS FOR SULFUR RECOVERY UNITS—Continued

[As stated in § 63.1568(b)(5), you shall meet each requirement in the following table that applies to you.]

For . . .	For the following emission limit . . .	You have demonstrated initial compliance if . . .
<p>2. Option 1: Elect NSPS. Each new or existing sulfur recovery unit (Claus or other type, regardless of size) not subject to the NSPS for sulfur oxides in 40 CFR 60.104(a)(2).</p> <p>3. Option 2: TRS limit. Each new or existing sulfur recovery unit (Claus or other type, regardless of size) not subject to the NSPS for sulfur oxides in 40 CFR 60.104(a)(2).</p>	<p>b. 300 ppmv of reduced sulfur compounds calculated as ppmv SO<sub>2</sub> (dry basis) at zero percent excess air if you use a reduction control system without incineration.</p> <p>a. 250 ppmv (dry basis) of SO<sub>2</sub> at zero percent excess air if you use an oxidation or reduction control system followed by incineration.</p> <p>b. 300 ppmv of reduced sulfur compounds calculated as ppmv SO<sub>2</sub> (dry basis) at zero percent excess air if you use a reduction control system without incineration.</p> <p>300 ppmv of TRS compounds expressed as an equivalent SO<sub>2</sub> concentration (dry basis) at zero percent oxygen.</p>	<p>You have already conducted a performance test to demonstrate initial compliance with the NSPS and each 12-hour rolling average concentration of reduced sulfur compounds measured by your continuous emission monitoring system is less than or equal to 300 ppmv, calculated as ppmv SO<sub>2</sub> (dry basis) at zero percent excess air. As part of the Notification of Compliance Status, you must certify that your vent meets the SO<sub>2</sub> limit. You are not required to do another performance test to demonstrate initial compliance. You have already conducted a performance evaluation to demonstrate initial compliance with the applicable performance specification. As part of your Notification of Compliance Status, you must certify that your continuous emission monitoring system meets the applicable requirements in § 63.1572. You are not required to do another performance evaluation to demonstrate initial compliance.</p> <p>Each 12-hour rolling average concentration of SO<sub>2</sub> emissions measured by the continuous emission monitoring system during the initial performance test is less than or equal to 250 ppmv (dry basis) at zero percent excess air; and your performance evaluation shows the monitoring system meets the applicable requirements in § 63.1572.</p> <p>Each 12-hour rolling average concentration of reduced sulfur compounds measured by the continuous emission monitoring system during the initial performance test is less than or equal to 300 ppmv, calculated as ppmv SO<sub>2</sub> (dry basis) at zero percent excess air; and your performance evaluation shows the continuous emission monitoring system meets the applicable requirements in § 63.1572.</p> <p>If you use continuous parameter monitoring systems, the average concentration of TRS emissions measured using Method 15 during the initial performance test is less than or equal to 300 ppmv expressed as equivalent SO<sub>2</sub> concentration (dry basis) at zero percent oxygen. If you use a continuous emission monitoring system, each 12-hour rolling average concentration of TRS emissions measured by the continuous emission monitoring system during the initial performance test is less than or equal to 300 ppmv expressed as an equivalent SO<sub>2</sub> (dry basis) at zero percent oxygen; and your performance evaluation shows the continuous emission monitoring system meets the applicable requirements in § 63.1572.</p>

■ 34. Table 34 to subpart UUU of part 63 is revised as follows:

TABLE 34 TO SUBPART UUU OF PART 63.—CONTINUOUS COMPLIANCE WITH HAP EMISSION LIMITS FOR SULFUR RECOVERY UNITS

[As stated in § 63.1568(c)(1), you shall meet each requirement in the following table that applies to you.]

For . . .	For this emission limit . . .	You shall demonstrate continuous compliance by . . .
<p>1. Each new or existing Claus sulfur recovery unit part of a sulfur recovery plant of 20 long tons per day or more and subject to the NSPS for sulfur oxides in 40 CFR 60.104(a)(2).</p>	<p>a. 250 ppmv (dry basis) of SO<sub>2</sub> at zero percent excess air if you use an oxidation or reduction control system followed by incineration.</p> <p>b. 300 ppmv of reduced sulfur compounds calculated as ppmv SO<sub>2</sub> (dry basis) at zero percent excess air if you use a reduction control system without incineration.</p>	<p>Collecting the hourly average SO<sub>2</sub> monitoring data (dry basis, percent excess air) according to § 63.1572; determining and recording each 12-hour rolling average concentration of SO<sub>2</sub>; maintaining each 12-hour rolling average concentration of SO<sub>2</sub> at or below the applicable emission limitation; and reporting any 12-hour rolling average concentration of SO<sub>2</sub> greater than the applicable emission limitation in the compliance report required by § 63.1575.</p>
<p>2. Option 1: Elect NSPS. Each new or existing sulfur recovery unit (Claus or other type, regardless of size) not subject to the NSPS for sulfur oxides in 40 CFR 60.104(a)(2).</p>	<p>a. 250 ppmv (dry basis) of SO<sub>2</sub> at zero percent excess air if you use an oxidation or reduction control system followed by incineration.</p> <p>b. 300 ppmv of reduced sulfur compounds calculated as ppmv SO<sub>2</sub> (dry basis) at zero percent excess air if you use a reduction control system without incineration.</p>	<p>Collecting the hourly average reduced sulfur (and air or O<sub>2</sub> dilution and oxidation) monitoring data according to § 63.1572; determining and recording each 12-hour rolling average concentration of reduced sulfur; maintaining each 12-hour rolling average concentration of reduced sulfur at or below the applicable emission limitation; and reporting any 12-hour rolling average concentration of reduced sulfur greater than the applicable emission limitation in the compliance report required by § 63.1575.</p>
<p>3. Option 2: TRS limit. Each new or existing sulfur recovery unit (Claus or other type, regardless of size) not subject to the NSPS for sulfur oxides in 40 CFR 60.104(a)(2).</p>	<p>300 ppmv of TRS compounds, expressed as an SO<sub>2</sub> concentration (dry basis) at zero percent oxygen or reduced sulfur compounds calculated as ppmv SO<sub>2</sub> (dry basis) at zero percent excess air.</p>	<p>Collecting the hourly average reduced sulfur (and air or O<sub>2</sub> dilution and oxidation) monitoring data according to § 63.1572; determining and recording each 12-hour rolling average concentration of reduced sulfur; maintaining each 12-hour rolling average concentration of reduced sulfur at or below the applicable emission limitation; and reporting any 12-hour rolling average concentration of reduced sulfur greater than the applicable emission limitation in the compliance report required by § 63.1575.</p> <p>i. If you use continuous parameter monitoring systems, collecting the hourly average TRS monitoring data according to § 63.1572 and maintaining each 12-hour average concentration of TRS at or below the applicable emission limitation; or</p> <p>ii. If you use a continuous emission monitoring system, collecting the hourly average TRS monitoring data according to § 63.1572, determining and recording each 12-hour rolling average concentration of TRS; maintaining each 12-hour rolling average concentration of TRS at or below the applicable emission limitation; and reporting any 12-hour rolling average TRS concentration greater than the applicable emission limitation in the compliance report required by § 63.1575.</p>

■ 35. Table 36 to subpart UUU is amended to revise entry 1 as follows:

TABLE 36 TO SUBPART UUU OF PART 63.—WORK PRACTICE STANDARDS FOR HAP EMISSIONS FROM BYPASS LINES

Option	You shall meet one of these equipment standards . . .
1. Option 1 .....	Install and operate a device (including a flow indicator, level recorder, or electronic valve position monitor) to demonstrate, either continuously or at least every hour, whether flow is present in the by bypass line. Install the device at or as near as practical to the entrance to any bypass line that could divert the vent stream away from the control device to the atmosphere.
* * * * *	

■ 36. Table 38 to subpart UUU is revised as follows:

TABLE 38 TO SUBPART UUU OF PART 63.—INITIAL COMPLIANCE WITH WORK PRACTICE STANDARDS FOR HAP EMISSIONS FROM BYPASS LINES

[As stated in § 63.1569(b)(2), you shall meet each requirement in the following table that applies to you.]

Option . . .	For this work practice standard . . .	You have demonstrated initial compliance if . . .
1. Each new or existing bypass line associated with a catalytic cracking unit, catalytic reforming unit, or sulfur recovery unit.	<p>a. Option 1: Install and operate a device (including a flow indicator, level recorder, or electronic valve position monitor) to demonstrate, either continuously or at least every hour, whether flow is present in bypass line. Install the device at or as near as practical to the entrance to any bypass line that could divert the vent stream away from the control device to the atmosphere.</p> <p>b. Option 2: Install a car-seal or lock-and-key device placed on the mechanism by which the bypass device flow position is controlled (e.g., valve handle, damper level) when the bypass device is in the closed position such that the bypass line valve cannot be opened without breaking the seal or removing the device.</p> <p>c. Option 3: Seal the bypass line by installing a solid blind between piping flanges.</p> <p>d. Option 4: Vent the bypass line to a control device that meets the appropriate requirements in this subpart.</p>	<p>The installed equipment operates properly during each run of the performance test and no flow is present in the line during the test.</p> <p>As part of the notification of compliance status, you certify that you installed the equipment, the equipment was operational by your compliance date, and you identify what equipment was installed.</p> <p>See item 1.b of this table.</p> <p>See item 1.b of this table.</p>

■ 37. Table 39 to subpart UUU is amended by revising entry 1 as follows:

TABLE 39 TO SUBPART UUU OF PART 63.—CONTINUOUS COMPLIANCE WITH WORK PRACTICE STANDARDS FOR HAP EMISSIONS FROM BYPASS LINES

If you elect this standard . . .	You shall demonstrate continuous compliance by . . .
1. Option 1: Flow indicator, level recorder, or electronic valve position monitor.	Monitoring and recording on a continuous basis or at least every hour whether flow is present in the bypass line; visually inspecting the device at least once every hour if the device is not equipped with a recording system that provides a continuous record; and recording whether the device is operating properly and whether flow is present in the bypass line.
* * * * *	

■ 38. Table 40 to subpart UUU is amended to revise entry 4, 5, 6, and 8 as follows:

TABLE 40 TO SUBPART UUU OF PART 63.—REQUIREMENTS FOR INSTALLATION, OPERATION, AND MAINTENANCE OF CONTINUOUS OPACITY MONITORING SYSTEMS AND CONTINUOUS EMISSION MONITORING SYSTEMS

*	*	*	*	*	*	*
This type of continuous opacity or emission monitoring system . . .			Must meet these requirements . . .			
*	*	*	*	*	*	*
4.	SO <sub>2</sub> continuous emission monitoring system for sulfur recovery unit with oxidation control system or reduction control system; this monitor must include an O <sub>2</sub> monitor for correcting the data for excess air.					Performance specification 2 (40 CFR part 60, appendix B); span value of 500 ppm SO <sub>2</sub> ; use Methods 6 or 6C and 3A or 3B (40 CFR part 60, appendix A) for certifying O <sub>2</sub> monitor; and procedure 1 (40 CFR part 60, appendix F) except relative accuracy test audits are required annually instead of quarterly.
5.	Reduced sulfur and O <sub>2</sub> continuous emission monitoring system for sulfur recovery unit with reduction control system not followed by incineration; this monitor must include an O <sub>2</sub> monitor for correcting the data for excess air unless exempted.					Performance specification 5 (40 CFR part 60, appendix B), except calibration drift specification is 2.5 percent of the span value instead of 5 percent; 450 ppm reduced sulfur; use Methods 15 or 15A and 3A or 3B (40 CFR part 60, appendix A) for certifying O <sub>2</sub> monitor; if Method 3A or 3B yields O <sub>2</sub> concentrations below 0.25 percent during the performance evaluation, the O <sub>2</sub> concentration can be assumed to be zero and the O <sub>2</sub> monitor is not required; and procedure 1 (40 CFR part 60, appendix F), except relative accuracy test audits, are required annually instead of quarterly.
6.	Instrument with an air or O <sub>2</sub> dilution and oxidation system to convert reduced sulfur to SO <sub>2</sub> for continuously monitoring the concentration of SO <sub>2</sub> instead of reduced sulfur monitor and O <sub>2</sub> monitor.					Performance specification 5 (40 CFR part 60, appendix B); span value of 375 ppm SO <sub>2</sub> ; use Methods 15 or 15A and 3A or 3B for certifying O <sub>2</sub> monitor; and procedure 1 (40 CFR part 60, appendix F), except relative accuracy test audits, are required annually instead of quarterly.
*	*	*	*	*	*	*
8.	O <sub>2</sub> monitor for oxygen concentration.					If necessary due to interferences, locate the oxygen sensor prior to the introduction of any outside gas stream; performance specification 3 (40 CFR part 60, appendix B; and procedure 1 (40 CFR part 60, appendix F), except relative accuracy test audits, are required annually instead of quarterly.

■ 39. Table 41 to Subpart UUU is revised as follows:

TABLE 41 TO SUBPART UUU OF PART 63.—REQUIREMENTS FOR INSTALLATION, OPERATION, AND MAINTENANCE OF CONTINUOUS PARAMETER MONITORING SYSTEMS

[As stated in § 63.1572(c)(1), you shall meet each requirement in the following table that applies to you.]

If you use . . .	You shall . . .
1. pH strips	Use pH strips with an accuracy of ± 10 percent.
2. Colormetric tube sampling system.	Use a colormetric tube sampling system with a printed numerical scale in ppmv, a standard measurement range of 1 to 10 ppmv (or 1 to 30 ppmv if applicable), and a standard deviation for measured values of no more than ± 15 percent. System must include a gas detection pump and hot air probe if needed for the measurement range.

■ 40. Table 44 to subpart UUU of part 63 is revised as follows:

TABLE 44 TO SUBPART UUU OF PART 63.—APPLICABILITY OF NESHAP GENERAL PROVISIONS TO SUBPART UUU

[As stated in § 63.1577, you shall meet each requirement in the following table that applies to you.]

Citation	Subject	Applies to subpart UUU	Explanation
§ 63.1	Applicability	Yes	Except that subpart UUU specifies calendar or operating day.  In § 63.5(b)(4), replace the reference to § 63.9 with § 63.9(b)(4) and (5).
§ 63.2	Definitions	Yes.	
§ 63.3	Units and Abbreviations	Yes.	
§ 63.4	Prohibited Activities	Yes.	
§ 63.5(A)–(C)	Construction and Reconstruction.	Yes	

TABLE 44 TO SUBPART UUU OF PART 63.—APPLICABILITY OF NESHAP GENERAL PROVISIONS TO SUBPART UUU—  
Continued

[As stated in § 63.1577, you shall meet each requirement in the following table that applies to you.]

Citation	Subject	Applies to subpart UUU	Explanation
§ 63.5(d)(1)(i)	Application for Approval of Construction or Reconstruction—General Application Requirements.	Yes	Except, subpart UUU specifies the application is submitted as soon as practicable before startup but not later than 90 days (rather than 60) after the promulgation date where construction or reconstruction had commenced and initial startup had not occurred before promulgation.
§ 63.5(d)(1)(ii)		Yes	Except that emission estimates specified in § 63.5(d)(1)(ii)(H) are not required.
§ 63.5(d)(1)(iii)		No	Subpart UUU specifies submission of notification of compliance status.
§ 63.5(d)(2)		No.	
§ 63.5(d)(3)		Yes	Except that § 63.5(d)(3)(ii) does not apply.
§ 63.5(d)(4)		Yes.	
§ 63.5(e)	Approval of Construction or Reconstruction.	Yes.	
§ 63.5(f)(1)	Approval of Construction or Reconstruction Based on State Review.		
§ 63.5(f)(2)		Yes	Except that 60 days is changed to 90 days and cross-reference to 53.9(B)(2) does not apply.
§ 63.6(a)	Compliance with Standards and Maintenance—Applicability.	Yes.	
§ 63.6(b)(1)–(4)	Compliance Dates for New and Reconstructed Sources.	Yes.	
§ 63.6(b)(5)		Yes	Except that subpart UUU specifies different compliance dates for sources.
§ 63.6(b)(6)	[Reserved]	Not applicable.	
§ 63.6(b)(7)	Compliance Dates for New and Reconstructed Area Sources That Become Major.	Yes.	
§ 63.6(c)(1)–(2)	Compliance Dates for Existing Sources.	Yes	Except that subpart UUU specifies different compliance dates for sources subject to Tier II gasoline sulfur control requirements.
§ 63.6(c)(3)–(4)	[Reserved]	Not applicable.	
§ 63.6(c)(5)	Compliance Dates for Existing Area Sources That Become Major.	Yes.	
§ 63.6(d)	[Reserved]	Not applicable.	
§ 63.6(e)(1)–(2)	Operation and Maintenance Requirements.	Yes.	
§ 63.6(e)(3)(i)–(iii)	Startup, Shutdown, and Malfunction Plan.	Yes.	
§ 63.6(e)(3)(iv)		Yes	Except that reports of actions not consistent with plan are not required within 2 and 7 days of action but rather must be included in next periodic report.
§ 63.6(e)(3)(v)–(viii)		Yes	The owner or operator is only required to keep the latest version of the plan.
§ 63.6(f)(1)–(2)(iii)(C)	Compliance with Emission Standards.	Yes.	
§ 63.6(f)(2)(iii)(D)		No.	
§ 63.6(f)(2)(iv)–(v)		Yes.	
§ 63.6(f)(3)		Yes.	
§ 63.6(g)	Alternative Standard	Yes.	
§ 63.6(h)	Opacity/VE Standards	Yes.	
§ 63.6(h)(2)(i)	Determining Compliance with Opacity/VE Standards.	No	Subpart UUU specifies methods.
§ 63.6(h)(2)(ii)	[Reserved]	Not applicable.	
§ 63.6(h)(2)(iii)		Yes.	
§ 63.6(h)(3)	[Reserved]	Not applicable.	
§ 63.6(h)(4)	Notification of Opacity/VE Observation Date.	Yes	Applies to Method 22 tests.
§ 63.6(h)(5)	Conducting Opacity/VE Observations.	No.	

TABLE 44 TO SUBPART UUU OF PART 63.—APPLICABILITY OF NESHAP GENERAL PROVISIONS TO SUBPART UUU—  
Continued

[As stated in § 63.1577, you shall meet each requirement in the following table that applies to you.]

Citation	Subject	Applies to subpart UUU	Explanation
§ 63.6(h)(6)	Records of Conditions During Opacity/VE Observations.	Yes	Applies to Method 22 observations.
§ 63.6(h)(7)(i)	Report COM Monitoring Data from Performance Test.	Yes.	
§ 63.6(h)(7)(ii)	Using COM Instead of Method 9.	No.	
§ 63.6(h)(7)(iii)	Averaging Time for COM during Performance Test.	Yes.	
§ 63.6(h)(7)(iv)	COM Requirements	Yes.	
§ 63.6(h)(8)	Determining Compliance with Opacity/VE Standards.	Yes.	
§ 63.6(h)(9)	Adjusted Opacity Standard	Yes.	
§ 63.6(i)(1)–(14)	Extension of Compliance	Yes	Extension of compliance under § 63.6(i)(4) not applicable to a facility that installs catalytic cracking feed hydrotreating and receives an extended compliance date under § 63.1563(c).
§ 63.6(i)(15)	[Reserved]	Not applicable.	
§ 63.6(i)(16)		Yes.	
§ 63.6(j)	Presidential Compliance Exemption.	Yes.	
§ 63.7(a)(1)	Performance Test Requirements Applicability.	Yes	Except that subpart UUU specifies the applicable test and demonstration procedures.
§ 63.7(a)(2)	Performance Test Dates	No	Test results must be submitted in the Notification of Compliance Status report due 150 days after the compliance date.
§ 63.7(a)(3)	Section 114 Authority	Yes.	
§ 63.7(b)	Notifications	Yes	Except that subpart UUU specifies notification at least 30 days prior to the scheduled test date rather than 60 days.
§ 63.7(c)	Quality Assurance Program/Site-Specific Test Plan.	Yes.	
§ 63.7(d)	Performance Test Facilities	Yes.	
§ 63.7(e)	Conduct of Tests	Yes.	
§ 63.7(f)	Alternative Test Method	Yes.	
§ 63.7(g)	Data Analysis, Record-keeping, Reporting.	Yes	Except performance test reports must be submitted with notification of compliance status due 150 days after the compliance date.
§ 63.7(h)	Waiver of Tests	Yes.	
§ 63.8(a)(1)	Monitoring Requirements-Applicability.	Yes.	
§ 63.8(a)(2)	Performance Specifications	Yes.	
§ 63.8(a)(3)	[Reserved]	Not applicable.	
§ 63.8(a)(4)	Monitoring with Flares	Yes.	
§ 63.8(b)(1)	Conduct of Monitoring	Yes.	
§ 63.8(b)(2)–(3)	Multiple Effluents and Multiple Monitoring Systems.	Yes	Subpart UUU specifies the required monitoring locations.
§ 63.8(c)(1)	Monitoring System Operation and Maintenance.	Yes.	
§ 63.8(c)(1)(i)–(ii)	Startup, Shutdown, and Malfunctions.	Yes	Except that subpart UUU specifies that reports are not required if actions are consistent with the SSM plan, unless requested by the permitting authority. If actions are not consistent, actions must be described in next compliance report.
§ 63.8(c)(1)(iii)	Compliance with Operation and Maintenance Requirements.	Yes.	
§ 63.8(c)(2)–(3)	Monitoring System Installation.	Yes	Except that subpart UUU specifies that for continuous parameter monitoring systems, operational status verification includes completion of manufacturer written specifications or installation, operation, and calibration of the system or other written procedures that provide adequate assurance that the equipment will monitor accurately.
§ 63.8(c)(4)	Continuous Monitoring System Requirements.	No	Subpart UUU specifies operational requirements.

TABLE 44 TO SUBPART UUU OF PART 63.—APPLICABILITY OF NESHAP GENERAL PROVISIONS TO SUBPART UUU—  
Continued

[As stated in § 63.1577, you shall meet each requirement in the following table that applies to you.]

Citation	Subject	Applies to subpart UUU	Explanation
§ 63.8(c)(4)(i)–(ii)	Continuous Monitoring System Requirements.	Yes	Except that these requirements apply only to a continuous opacity monitoring system or a continuous emission monitoring system if you are subject to the NSPS or elect to comply with the NSPS opacity, CO, or SO <sub>2</sub> limits.
§ 63.8(c)(5)	COM Minimum Procedures	Yes.	
§ 63.8(c)(6)	CMS Requirements	No	Except that these requirements apply only to a continuous opacity monitoring system or continuous emission monitoring system if you are subject to the NSPS or elect to comply with the NSPS opacity, CO, or SO <sub>2</sub> limits.
§ 63.8(c)(7)–(8)	CMS Requirements	Yes.	
§ 63.8(d)	Quality Control Program	Yes	Except that these requirements apply only to a continuous opacity monitoring system or continuous emission monitoring system if you are subject to the NSPS or elect to comply with the NSPS opacity, CO, or SO <sub>2</sub> limits.
§ 63.8(e)	CMS Performance Evaluation.	Yes	Except that these requirements apply only to a continuous opacity monitoring system or continuous emission monitoring system if you are subject to the NSPS or elect to comply with the NSPS opacity, CO, or SO <sub>2</sub> limits. Results are to be submitted as part of the Notification Compliance Status due 150 days after the compliance date.
§ 63.8(f)(1)–(5)	Alternative Monitoring Methods.	Yes	Except that subpart UUU specifies procedures for requesting alternative monitoring systems and alternative parameters.
§ 63.8(f)(6)	Alternative to Relative Accuracy Test.	Yes	Applicable to continuous emission monitoring systems if performance specification requires a relative accuracy test audit.
§ 63.8(g)(1)–(4)	Reduction of Monitoring Data.	Yes	Applies to continuous opacity monitoring system or continuous emission monitoring system.
§ 63.8(g)(5)	Data Reduction	No	Subpart UUU specifies requirements.
§ 63.9(a)	Notification Requirements—Applicability.	Yes	Duplicate Notification of Compliance Status report to the Regional Administrator may be required.
§ 63.9(b)(1)–(2), (4)–(5)	Initial Notifications	Yes	Except that notification of construction or reconstruction is to be submitted as soon as practicable before startup but no later than 30 days (rather than 60 days) after the effective date if construction or reconstruction had commenced but startup had not occurred before the effective date.
§ 63.9(b)(3)	[Reserved].		
§ 63.9(c)	Request for Extension of Compliance.	Yes.	
§ 63.9(d)	New Source Notification for Special Compliance Requirements.	Yes.	
§ 63.9(e)	Notification of Performance Test.	Yes	Except that notification is required at least 30 days before test.
§ 63.9(f)	Notification of VE/Opacity Test.	Yes.	
§ 63.9(g)	Additional Notification Requirements for Sources with Continuous Monitoring Systems.	Yes	Except that these requirements apply only to a continuous opacity monitoring system or continuous emission monitoring system if you are subject to the NSPS or elect to comply with the NSPS opacity, CO, or SO <sub>2</sub> limits.
§ 63.9(h)	Notification of Compliance Status.	Yes	Except that subpart UUU specifies the notification is due no later than 150 days after compliance date.
§ 63.9(i)	Adjustment of Deadlines	Yes.	
§ 63.9(j)	Change in Previous Information.	Yes.	
63.10(a)	Recordkeeping and Reporting Applicability.	Yes.	
§ 63.10(b)	Records	Yes	Except that § 63.10(b)(2)(xiii) applies if you use a continuous emission monitoring system to meet the NSPS or you select to meet the NSPS, CO, or SO <sub>2</sub> reduced sulfur limit and the performance evaluation requires a relative accuracy test audit.



TABLE 44 TO SUBPART UUU OF PART 63.—APPLICABILITY OF NESHAP GENERAL PROVISIONS TO SUBPART UUU—  
Continued

[As stated in § 63.1577, you shall meet each requirement in the following table that applies to you.]

Citation	Subject	Applies to subpart UUU	Explanation
§ 63.10(c)(1)–(6), (9)–(15) ...	Additional Records for Continuous Monitoring Systems.	Yes .....	Except that these requirements apply if you use a continuous opacity monitoring system or a continuous emission monitoring system to meet the NSPS or elect to meet the NSPS opacity, CO, or SO <sub>2</sub> limits.
§ 63.10(c)(7)–(8) .....	Records of Excess Emissions and Exceedances.	No .....	Subpart UUU specifies requirements.
§ 63.10(d)(1) .....	General Reporting Requirements.	Yes.	
§ 63.10(d)(2) .....	Performance Test Results	No .....	Subpart UUU requires performance test results to be reported as part of the Notification of Compliance Status due 150 days after the compliance date.
§ 63.10(d)(3) .....	Opacity or VE Observations.	Yes.	
§ 63.10(d)(4) .....	Progress Reports .....	Yes.	
§ 63.10(d)(5)(i) .....	Startup, Shutdown, and Malfunction Reports.	Yes .....	Except that reports are not required if actions are consistent with the SSM plan, unless requested by permitting authority.
§ 63.10(d)(5)(ii) .....		Yes .....	Except that actions taken during a startup, shutdown, or malfunction that are not consistent with the plan do not need to be reported within 2 and 7 days of commencing and completing the action, respectively, but must be included in the next periodic report.
§ 63.10(e)(1)–(2) .....	Additional CMS Reports ....	Yes .....	Except that these requirements apply only to a continuous opacity monitoring system or continuous emission monitoring system if you are subject to the NSPS or elect to comply with the NSPS opacity, CO, or SO <sub>2</sub> limits. Reports of performance evaluations must be submitted in Notification of Compliance Status.
§ 63.10(e)(3) .....	Excess Emissions/CMS Performance Reports.	No .....	Subpart UUU specifies the applicable requirements.
§ 63.10(e)(4) .....	COMS Data Reports .....	Yes.	
§ 63.10(f) .....	Recordkeeping/Reporting Waiver.	Yes.	
§ 63.11 .....	Control Device Requirements.	Yes .....	Applicable to flares.
§ 63.13 .....	Addresses .....	Yes.	
§ 63.14 .....	Incorporation by Reference	Yes.	
§ 63.15 .....	Available of Information .....	Yes.	

■ 41. Subpart UUU of part 63 is amended by adding appendix A to read as follows:

**Appendix A To Subpart UUU of Part 63—Determination of Metal Concentration on Catalyst Particles (Instrumental Analyzer Procedure)**

with an atomic number between 11 (sodium) and 92 (uranium), inclusive. Specific analytes for which this method was developed include:

*1.0 Scope and Application.*

1.1 Analytes. The analytes for which this method is applicable include any elements

Analyte	CAS No.	Minimum detectable limit
Nickel compounds .....	7440–02–0	<2 % of span.
Total chlorides .....	16887–00–6	<2 % of span.

1.2 Applicability. This method is applicable to the determination of analyte concentrations on catalyst particles. This method is applicable for catalyst particles obtained from the fluid catalytic cracking unit (FCCU) regenerator (*i.e.*, equilibrium catalyst), from air pollution control systems operated for the FCCU catalyst regenerator vent (FCCU fines), from catalytic reforming

units (CRU), and other processes as specified within an applicable regulation. This method is applicable only when specified within the regulation.

1.3 Data Quality Objectives. Adherence to the requirements of this method will enhance the quality of the data obtained from the analytical method.

*2.0 Summary of Method.*

2.1 A representative sample of catalyst particles is collected, prepared, and analyzed for analyte concentration using either energy or wavelength dispersive X-ray fluorescent (XRF) spectrometry instrumental analyzers. In both types of XRF spectrometers, the instrument irradiates the sample with high energy (primary) x-rays and the elements in

the sample absorb the x-rays and then re-emit secondary (fluorescent) x-rays of characteristic wavelengths for each element present. In energy dispersive XRF spectrometers, all secondary x-rays (of all wavelengths) enter the detector at once. The detector registers an electric current having a height proportional to the photon energy, and these pulses are then separated electronically, using a pulse analyzer. In wavelength dispersive XRF spectrometers, the secondary x-rays are dispersed spatially by crystal diffraction on the basis of wavelength. The crystal and detector are moved to synchronously rotate and the detector then receives only one wavelength at a time. The intensity of the x-rays emitted by each element is proportional to its concentration, after correcting for matrix effects. For nickel compounds and total chlorides, the XRF instrument response is expected to be linear to analyte concentration. Performance specifications and test procedures are provided to ensure reliable data.

### 3.0 Definitions.

3.1 Measurement System. The total equipment required for the determination of analyte concentration. The measurement system consists of the following major subsystems:

3.1.1 Sample Preparation. That portion of a system used for one or more of the following: sample acquisition, sample transport, sample conditioning, or sample preparation prior to introducing the sample into the analyzer.

3.1.2 Analyzer. That portion of the system that senses the analyte to be measured and generates an output proportional to its concentration.

3.1.3 Data Recorder. A digital recorder or personal computer used for recording measurement data from the analyzer output.

3.2 Span. The upper limit of the gas concentration measurement range displayed on the data recorder.

3.3 Calibration Standards. Prepared catalyst samples or other samples of known analyte concentrations used to calibrate the analyzer and to assess calibration drift.

3.4 Energy Calibration Standard. Calibration standard, generally provided by the XRF instrument manufacturer, used for assuring accuracy of the energy scale.

3.5 Accuracy Assessment Standard. Prepared catalyst sample or other sample of known analyte concentrations used to assess analyzer accuracy error.

3.6 Zero Drift. The difference in the measurement system output reading from the initial value for zero concentration level calibration standard after a stated period of operation during which no unscheduled maintenance, repair, or adjustment took place.

3.7 Calibration Drift. The difference in the measurement system output reading from the initial value for the mid-range calibration standard after a stated period of operation during which no unscheduled maintenance, repair, or adjustment took place.

3.8 Spectral Interferences. Analytical interferences and excessive biases caused by elemental peak overlap, escape peak, and

sum peak interferences between elements in the samples.

3.9 Calibration Curve. A graph or other systematic method of establishing the relationship between the analyzer response and the actual analyte concentration introduced to the analyzer.

3.10 Analyzer Accuracy Error. The difference in the measurement system output reading and the ideal value for the accuracy assessment standard.

### 4.0 Interferences.

4.1 Spectral interferences with analyte line intensity determination are accounted for within the method program. No action is required by the XRF operator once these interferences have been addressed within the method.

4.2 The X-ray production efficiency is affected by particle size for the very lightest elements. However, particulate matter (PM) 2.5 particle size effects are substantially < 1 percent for most elements. The calibration standards should be prepared with material of similar particle size or be processed (ground) to produce material of similar particle size as the catalyst samples to be analyzed. No additional correction for particle size is performed. Alternatively, the sample can be fused in order to eliminate any potential particle size effects.

### 5.0 Safety.

5.1 Disclaimer. This method may involve hazardous materials, operations, and equipment. This test method may not address all of the safety problems associated with its use. It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to performing this test method.

5.2 X-ray Exposure. The XRF uses X-rays; XRF operators should follow instrument manufacturer's guidelines to protect from accidental exposure to X-rays when the instrument is in operation.

5.3 Beryllium Window. In most XRF units, a beryllium (Be) window is present to separate the sample chamber from the X-ray tube and detector. The window is very fragile and brittle. Do not allow sample or debris to fall onto the window, and avoid using compressed air to clean the window because it will cause the window to rupture. If the window should rupture, note that Be metal is poisonous. Use extreme caution when collecting pieces of Be and consult the instrument manufacturer for advice on cleanup of the broken window and replacement.

### 6.0 Equipment and Supplies.

6.1 Measurement System. Use any measurement system that meets the specifications of this method listed in section 13. The typical components of the measurement system are described below.

6.1.1 Sample Mixer/Mill. Stainless steel, or equivalent to grind/mix catalyst and binders, if used, to produce uniform particle samples.

6.1.2 Sample Press/Fluxer. Stainless steel, or equivalent to produce pellets of sufficient size to fill analyzer sample window, or alternatively, a fusion device

capable of preparing a fused disk of sufficient size to fill analyzer sample window.

6.1.3 Analytical Balance.  $\pm 0.0001$  gram accuracy for weighing prepared samples (pellets).

6.1.4 Analyzer. An XRF spectrometer to determine the analyte concentration in the prepared sample. The analyzer must meet the applicable performance specifications in section 13.

6.1.5 Data Recorder. A digital recorder or personal computer for recording measurement data. The data recorder resolution (*i.e.*, readability) must be 0.5 percent of span. Alternatively, a digital or analog meter having a resolution of 0.5 percent of span may be used to obtain the analyzer responses and the readings may be recorded manually.

### 7.0 Reagents and Standards.

7.1 Calibration Standards. The calibration standards for the analyzer must be prepared catalyst samples or other material of similar particle size and matrix as the catalyst samples to be tested that have known concentrations of the analytes of interest. Preparation (grinding/milling/fusion) of the calibration standards should follow the same processes used to prepare the catalyst samples to be tested. The calibration standards values must be established as the average of a minimum of three analyses using an approved EPA or ASTM method with instrument analyzer calibrations traceable to the U.S. National Institute of Standards and Technology (NIST), if available. The maximum percent deviation of the triplicate calibration standard analyses should agree within 10 percent of the average value for the triplicate analysis (see Figure 1). If the calibration analyses do not meet this criteria, the calibration standards must be re-analyzed. If unacceptable variability persists, new calibration standards must be prepared. Approved methods for the calibration standard analyses include, but are not limited to, EPA Methods 6010B, 6020, 7520, or 7521 of SW-846.<sup>1</sup> Use a minimum of four calibration standards as specified below (see Figure 1):

7.1.1 High-Range Calibration Standard. Concentration equivalent to 80 to 100 percent of the span. The concentration of the high-range calibration standard should exceed the maximum concentration anticipated in the catalyst samples.

7.1.2 Mid-Range Calibration Standard. Concentration equivalent to 40 to 60 percent of the span.

7.1.3 Low-Range Calibration Standard. Concentration equivalent to 1 to 20 percent of the span. The concentration of the low-range calibration standard should be selected so that it is less than either one-fourth of the applicable concentration limit or of the lowest concentration anticipated in the catalyst samples.

7.1.4 Zero Calibration Standard. Concentration of less than 0.25 percent of the span.

7.2 Accuracy Assessment Standard. Prepare an accuracy assessment standard and determine the ideal value for the accuracy assessment standard following the same procedures used to prepare and analyze the

calibration standards as described in section 7.1. The maximum percent deviation of the triplicate accuracy assessment standard analyses should agree within 10 percent of the average value for the triplicate analysis (see Figure 1). The concentration equivalent of the accuracy assessment standard must be between 20 and 80 percent of the span.

7.3 Energy Calibration Standard. Generally, the energy calibration standard will be provided by the XRF instrument manufacturer for energy dispersive spectrometers. Energy calibration is performed using the manufacturer's recommended calibration standard and involves measurement of a specific energy line (based on the metal in the energy calibration standard). This is generally an automated procedure used to assure the accuracy of the energy scale. This calibration standard may not be applicable to all models of XRF spectrometers (particularly wavelength dispersive XRF spectrometers).

#### 8.0 Sample Collection, Preservation, Transport, and Storage. [Reserved]

#### 9.0 Quality Control.

9.1 Energy Calibration. For energy dispersive spectrometers, conduct the energy calibration by analyzing the energy calibration standard provided by the manufacturer. The energy calibration involves measurement of a specific energy line (based on the metal in the energy calibration standard) and then determination of the difference between the measured peak energy value and the ideal value. This analysis, if applicable, should be performed daily prior to any sample analyses to check the instrument's energy scale. This is generally an automated procedure and assures the accuracy of the energy scale. If the energy scale calibration process is not

automated, follow the manufacturer's procedures to manually adjust the instrument, as necessary.

9.2 Zero Drift Test. Conduct the zero drift test by analyzing the analyte concentration output by the measurement system with the initial calibration value for the zero calibration standard (see Figure 2). This analysis should be performed with each set of samples analyzed.

9.3 Calibration Drift Test. Conduct the calibration drift test by analyzing the analyte concentration output by the measurement system with the initial calibration value for the mid-range calibration standard (see Figure 2). This analysis should be performed with each set of samples analyzed.

9.4 Analyzer Accuracy Test. Conduct the analyzer accuracy test by analyzing the accuracy assessment standard and comparing the value output by the measurement system with the ideal value for the accuracy assessment standard (see Figure 2). This analysis should be performed with each set of samples analyzed.

#### 10.0 Calibration and Standardization.

10.1 Perform the initial calibration and set-up following the instrument manufacturer's instructions. These procedures should include, at a minimum, the major steps listed in sections 10.2 and 10.3. Subsequent calibrations are to be performed when either a quality assurance/quality control (QA/QC) limit listed in section 13 is exceeded or when there is a change in the excitation conditions, such as a change in the tube, detector, X-ray filters, or signal processor. Calibrations are typically valid for 6 months to 1 year.

10.2 Instrument Calibration. Calibration is performed initially with calibration standards of similar matrix and binders, if

used, as the samples to be analyzed (see Figure 1).

10.3 Reference Peak Spectra. Acquisition of reference spectra is required only during the initial calibration. As long as no processing methods have changed, these peak shape references remain valid. This procedure consists of placing the standards in the instrument and acquiring individual elemental spectra that are stored in the method file with each of the analytical conditions. These reference spectra are used in the standard deconvolution of the unknown spectra.

#### 11.0 Analytical Procedure.

11.1 Sample Preparation. Prepare catalyst samples using the same procedure used to prepare the calibration standards. Measure and record the weight of sample used. Measure and record the amount of binder, if any, used. Pellets or films must be of sufficient size to cover the analyzer sample window.

11.2 Sample Analyses. Place the prepared catalyst samples into the analyzer. Follow the manufacturer's instructions for analyzing the samples.

11.3 Record and Store Data. Use a digital recorder or personal computer to record and store results for each sample. Record any mechanical or software problems encountered during the analysis.

#### 12.0 Data Analysis and Calculations.

Carry out the following calculations, retaining at least one extra significant figure beyond that of the acquired data. Round off figures after final calculation.

12.1 Drift. Calculate the zero and calibration drift for the tests described in sections 9.2 and 9.3 (see also Figure 2) as follows:

$$\text{QC Value} = \frac{\text{CurrentAnalyzerCal. Response} - \text{InitialCal. Response}}{\text{Span}} \times 100 \quad (\text{Eq. A-1})$$

Where:

CurrentAnalyzerCal.Response = Instrument response for current QC sample analyses;  
InitialCal.Response = Initial instrument response for calibration standard;

QC Value = QC metric (zero drift or calibration drift), percent of span;  
Span = Span of the monitoring system.

12.2 Analyzer Accuracy. Calculate the analyzer accuracy error for the tests described in section 9.4 (see also Figure 2) as follows:

$$\text{Accuracy Value} = \frac{\text{CurrentAnalyzerCal. Response} - \text{IdealCal. Response}}{\text{IdealCal. Response}} \times 100 \quad (\text{Eq. A-2})$$

Where:

Accuracy Value = Percent difference of instrument response to the ideal response for the accuracy assessment standard;  
CurrentAnalyzerCal.Response = Instrument response for current QC sample analyses;  
IdealCal.Response = Ideal instrument response for the accuracy assessment standard.

#### 13.0 Method Performance.

13.1 Analytical Range. The analytical range is determined by the instrument design. For this method, a portion of the

analytical range is selected by choosing the span of the monitoring system. The span of the monitoring system must be selected such that it encompasses the range of concentrations anticipated to occur in the catalyst sample. If applicable, the span must be selected such that the analyte concentration equivalent to the emission standard is not less than 30 percent of the span. If the measured analyte concentration exceeds the concentration of the high-range calibration standard, the sample analysis is considered invalid. Additionally, if the measured analyte concentration is less than

the concentration of the low-range calibration standard but above the detectable limit, the sample analysis results must be flagged with a footnote stating, in effect, that the analyte was detected but that the reported concentration is below the lower quantitation limit.

13.2 Minimum Detectable Limit. The minimum detectable limit depends on the signal-to-noise ratio of the measurement system. For a well-designed system, the minimum detectable limit should be less than 2 percent of the span.

13.3 Zero Drift. Less than  $\pm 2$  percent of the span.  
 13.4 Calibration Drift. Less than  $\pm 5$  percent of the span.  
 13.5 Analyzer Accuracy Error. Less than  $\pm 10$  percent.

14.0 *Pollution Prevention. [Reserved]*  
 15.0 *Waste Management. [Reserved]*  
 16.0 *Alternative Procedures. [Reserved]*  
 17.0 *References.*  
 1. U.S. Environmental Protection Agency. 1998. Test Methods for Evaluating Solid

Waste, Physical/Chemical Methods. EPA Publication No. SW-846, Revision 5 (April 1998). Office of Solid Waste, Washington, DC.  
 18.0 *Tables, Diagrams, Flowcharts, and Validation Data.*

Date:

Analytic Method Used:

	Zero <sup>a</sup>	Low-Range <sup>b</sup>	Mid-Range <sup>c</sup>	High-Range <sup>d</sup>	Accuracy Std <sup>e</sup>
Sample Run: 1. 2. 3. Average. Maximum Percent Deviation.					

- <sup>a</sup> Average must be less than 0.25 percent of span.
- <sup>b</sup> Average must be 1 to 20 percent of span.
- <sup>c</sup> Average must be 40 to 60 percent of span.
- <sup>d</sup> Average must be 80 to 100 percent of span.
- <sup>e</sup> Average must be 20 to 80 percent of span.

Figure 1. Data Recording Sheet for Analysis of Calibration Samples.

Source Identification:  
 Run Number:  
 Test Personnel:  
 Span:  
 Date:

	Initial calibration response	Current analyzer calibration response	Drift (percent of span)
Zero Standard. Mid-range Standard.			
	Ideal calibration response	Current analyzer calibration response	Accuracy error (percent of ideal)
Accuracy Standard.			

Figure 2. Data Recording Sheet for System Calibration Drift Data.

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