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**40CFR63 SUBPART UUU: CATALYTIC CRACKING UNIT  
OPERATION, MAINTENANCE & MONITORING PLAN**

SUMMARY: Evaluation of Operation, Maintenance & Monitoring Plan (OMMP) for Catalytic Cracking Unit (CCU) subject to 40CFR63 Subpart UUU. The OMMP was submitted, as required by §63.1564(b)(6) & §63.1565(b)(5), to describe compliance options, emission limits, monitoring equipment, procedures, equipment maintenance and quality control plans as detailed in §63.1574(f).

**COMPANY INFORMATION**

Company Name: Tesoro Refining and Marketing Company, Facility ID No. 800436  
Mailing Address: P.O. Box 817, Wilmington, CA 90748  
Equipment Location: 2101 E. Pacific Coast Hwy, Wilmington, CA 90744  
Contact Person: Royann Winchester, (310) 522-6125

**COMPLIANCE RECORD REVIEW**

A query of the AQMD Compliance Database for the past two years (9/1/10 to 9/26/12) identified 9 Notice of Violations (NOVs) and 1 Notice to Comply (NC) that were issued to the Tesoro Refinery (Facility ID 800436). None of these violations appear to be for the CCU. The compliance database indicates that the facility is currently in compliance with applicable rules and regulations.

**FEE EVALUATION**

The BCAT for 40CFR63 Subpart UUU OMMP plans for FCCUs is 666614 [40CFR63UUU/FCCU], Schedule C. Fees of \$485.45 were paid when the application was submitted. Additional fees for T&M of \$1,280.06 are due for the additional 10.5 hours of evaluation required for this plan.

**BACKGROUND for 40 CFR PART 63, SUBPART UUU: National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units (Adopted 04/11/2002, Amended 02/09/2005)**

On April 11, 2002, the EPA 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. This regulation requires all petroleum refineries that are major sources to meet standards reflecting the application of the Maximum Achievable Control Technology (MACT) for Hazardous Air Pollutants (HAP). This regulation is commonly referred to as "Refinery MACT II" (note that "MACT I" generally refers to 40CFR63 Subpart CC, which also affects petroleum refineries, but was adopted prior to Subpart UUU).

**Use of surrogates** The HAP that are reduced by this rule include organics (acetaldehyde, benzene, formaldehyde, hexane, phenol, toluene, and xylene); reduced sulfur compounds (carbonyl sulfide, carbon disulfide); inorganics (hydrogen chloride, chlorine); and particulate metals (antimony, arsenic, beryllium, cadmium, chromium, cobalt, lead, manganese, and nickel). The requirements of this regulation focus on

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surrogate pollutants (such as PM, opacity and CO) to represent relative HAP emissions, rather than direct measurements of the HAP. The EPA stated in their response to rulemaking comments<sup>1</sup> that

“the determination of MACT floors for CCU organic HAP and metallic HAP were based on the control technologies used in the industry, complete combustion of vent gases for control of organic HAP and an ESP or Venturi scrubber for control of metallic HAP. Surrogates were used in the standards only to characterize the performance of these best performing technologies. We have used surrogates for listed HAP in several rules because this simplifies compliance demonstrations by allowing the use of well-known methods, i.e., methods used to comply with the other CAA standards such as NSPS, and reduces costs associated with constituent analyses<sup>2</sup>.”

**Relation to NSPS J** The primary compliance method allowed by this rule (although there are other options) is compliance with the 40CFR60 Subpart J New Source Performance Standards (NSPS) for Petroleum Refineries. Many, but not all affected facilities located in the SCAQMD, were already subject to Subpart J requirements. Although the NSPS is concerned with emissions of criteria pollutants, and the NESHAP is concerned with HAP emissions, analysis has indicated that for the Subpart UUU affected sources, emissions of both types of pollutants are controlled by the same means, as detailed below in the response by the EPA to a rulemaking question about the metallic HAP emission limits for CCUs.

“The EPA believes that the NSPS levels selected to characterize the MACT floor performance adequately account for the variability inherent in the processes themselves and the air pollution control technologies, and indicates what levels are consistently achievable in practice. ...the MACT floor for new sources is the same as that for existing sources of metallic HAP. No technology has been demonstrated in this industry to provide a level of control more stringent than the MACT floor for metallic HAP<sup>3</sup>.”

Note that one of the compliance options for facilities that are not subject to NSPS J is to voluntarily comply with NSPS J limits and monitoring requirements. Other compliance options focus on different emission performance parameters.

**Operation, Maintenance and Monitoring Plan Requirements** The requirement to submit a OMMP plan for approval is referenced in Subpart UUU sections covering each source type (CCU, CRU and SRU) and HAP emission category (metal HAP, organic HAP, inorganic HAP and HAP).

The requirement to prepare an OMMP and “operate at all times according to the procedures in the plan” is listed as a work practice standard for CCUs, CRU’s SRU, and bypass lines [§63.1564(a)(3); §63.1565(a)(3); §63.1566(a)(5); §63.1567(a)(3); §63.1568(a)(3); §63.1569(a)(3)].

Submittal of the OMMP is also required as part of the demonstration of initial compliance with the work practice standards for each source type [§63.1564(b)(6); §63.1565(b)(5); §63.1566(b)(7); §63.1567(b)(6); §63.1568(b)(6); §63.1569(b)(3)]. The referenced sections also note that the OMMP should be submitted as part of the Notification of Compliance Status.

<sup>1</sup> Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units – Background Information for Promulgated Standards and Response to Comments: Final Report, U.S. EPA Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711, EPA-453/R-01-011, June 2001.

<sup>2</sup> EPA-453/R-01-011, June 2001, Comment 1.2

<sup>3</sup> EPA-453/R-001-011, June 2001, Comment 1.3

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Demonstration of continuous compliance with the requirements of this regulation is accomplished partly by complying with and/or maintaining records to document conformance with “the procedures in your operation, maintenance and monitoring plan”. [§63.1564(c)(2); §63.1565(c)(2); §63.1566(c)(2); §63.1567(c)(2); §63.1568(c)(2); §63.1569(c)(2)].

The information required to be in each OMMP is specified in §63.1574(f)(2)(i) through § 63.1574(f)(2)(vii), provided below in **Table P1**. Note that some requirements are specific to the source type (noted in *italics for CRU only* or underline for CCU only) or required only for specific equipment configurations or compliance options. The objective of this evaluation is to assess whether the facility has provided the information required in **Table P1**.

**Table P1. Information Required in 40CFR63 Subpart UUU  
Operation, Maintenance and Monitoring Plans for CCUs, CRUs, and SRUs.**

<b>§ 63.1574(f)(2): Each plan must include, at a minimum, the information specified in paragraphs (f)(2)(i) through (xii) of this section.</b>	<b>Applicability</b>
<b>(i) Process and control device parameters to be monitored for each affected source, along with established operating limits.</b>	<b>All</b>
<b>(ii) Procedures for monitoring emissions and process and control device operating parameters for each affected source.</b>	<b>All</b>
<i>(iii) Procedures that you will use to determine the coke burn-rate, the volumetric flow rate (if you use process data rather than direct measurement), and the rate of combustion of liquid or solid fossil fuels if you use an incinerator-waste heat boiler to burn the exhaust gases from a catalyst regenerator.</i>	<u>CCU only</u>
<i>(iv) Procedures and analytical methods you will use to determine the equilibrium catalyst Ni concentration, the equilibrium catalyst Ni concentration monthly rolling average, and the hourly or hourly average Ni operating value.</i>	<u>CCU only</u>
<i>(v) Procedures you will use to determine the pH of the water (or scrubbing liquid) exiting a wet scrubber if you use pH strips.</i>	<i>CRU only</i>
<i>(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.</i>	<i>CRU only</i>
<i>(vii) Procedures you will use to determine the gas flow rate for a catalytic cracking unit if you use the alternative procedure based on air flow rate and temperature.</i>	<u>CCU only</u>
<b>(viii) Monitoring schedule, including when you will monitor and when you will not monitor an affected source (e.g., during the coke burn-off, regeneration process).</b>	<b>all</b>
<b>(ix) Quality control plan for each continuous opacity monitoring system and continuous emission monitoring system you use to meet an emission limit in this subpart. This plan must include procedures you will use for calibrations, accuracy audits, and adjustments to the system needed to meet applicable requirements for the system.</b>	<b>all</b>
<b>(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.</b>	<b>all</b>

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<p><i>(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.</i></p> <p><i>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.</i></p> <p><i>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).</i></p> <p><i>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.</i></p>	CRU only
<p><i>(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 controlled 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.</i></p>	CRU only

## **PLAN EVALUATION**

Tesoro submitted an OMMP for the CCU to the SCAQMD on October 1, 2007 for the Tesoro Refinery Fluidized Catalytic Cracking Unit (CCU). This plan was submitted after Tesoro purchased the Los Angeles Refinery from Equilon Enterprises LLC (d.b.a.) Shell Oil Products US. The sale was complete on May 10, 2007.

For CCUs, the facility has requirements for both Metal and Organic HAP. The compliance options for Subpart UUU requirements are provided in Subpart UUU tables for each equipment type and emission type. For Catalytic Cracking Units (CCU), Subpart UUU includes tables that describe the requirements to comply with emission limits (Table 1, 8), operating limits (Tables 2, 9), continuous monitoring systems (Tables 3, 10), continuous compliance with emission limits (Tables 6, 13), and continuous compliance with operating limits (Tables 7, 14) both for Metal HAP and for Organic HAP. *(Note that these table numbers are the tables numbered according to Subpart UUU. Other tables in this document are numbered separately and distinguished with a "P"# in the table title.)*

The regulation also includes tables describing requirements for performance testing (Tables 4, 11) and demonstrating initial compliance with the emission limits (Tables 5, 12), but these requirements are part of the Notification of Compliance Status, and not the OMMP, which is more concerned with ongoing operation of the affected equipment and how it will be maintained.

Excerpts of the Subpart UUU tables (with the same numbers as in Subpart UUU) are provided below, showing the compliance options selected by the facility. The Tesoro CCU is subject to NSPS J requirements. The compliance options for facilities subject to NSPS J are shown in the tables below.

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Note that the following tables are excerpts from the Subpart UUU tables and do not show other compliance options, such as Metal HAP limits based on Ni emissions, or CO emissions monitored by parameter monitoring systems, because they were not selected by the facility.

**COMPLIANCE OPTIONS/REQUIREMENTS FOR METAL HAP EMISSIONS FROM CCUs**

The Metal HAP emission limits are listed in Table 1. For facilities subject to the NSPS requirements for PM, the emission limits are the same as the NSPS emission limits: 1 kg PM per 1000 kg coke burn-off in the catalyst regenerator and an opacity limit of 30% (except for one 6-minute average in any 1-hour period). Table 2 shows that for facilities with a continuous opacity monitoring system, there are no applicable operating limits. Table 3 shows that CCUs can meet the requirements for continuous monitoring systems for Metal HAP with a continuous opacity monitoring system (COMS).

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 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 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.

Table 2 to Subpart UUU of Part 63—Operating Limits for Metal HAP Emissions From Catalytic Cracking Units

For each new or existing catalytic cracking unit . . .	For this type of continuous monitoring system . . .	For this type of control device . . .	You shall meet this operating limit . . .
1. Subject to the NSPS for PM in 40 CFR 60.102.	Continuous opacity monitoring system.	Not applicable	Not applicable.

Table 3 to Subpart UUU of Part 63—Continuous Monitoring Systems for Metal HAP Emissions From Catalytic Cracking Units

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.

Continuous compliance with Metal HAP emission limits is demonstrated as described in Table 6; determining and recording the daily average coke burn-off rate and maintaining it below the applicable emission limit, as well as collecting COMS data and maintaining each 6-minute average at or below 30% opacity (except that one 6-minute average during a 1-hour period can exceed 30%). Table 7 shows that since there are no operating limits (per Table 2), continuous compliance is demonstrated solely by the criteria in Table 6.

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 . . .
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.

Table 7 to Subpart UUU of Part 63—Continuous Compliance With Operating Limits for Metal HAP Emissions From Catalytic Cracking Units

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.

**COMPLIANCE OPTIONS/REQUIREMENTS FOR ORGANIC HAP EMISSIONS FROM CCUs**

The Organic HAP emission limits are listed in Table 8. For facilities subject to the NSPS requirements for PM, the emission limits are the same as the NSPS emission limits: 500 ppmv CO (dry basis). Table 9 shows that for facilities with a continuous emission monitoring system, there are no applicable operating limits. Table 10 shows that CCUs with an Organic HAP control device (such as a thermal incinerator, process heater/boiler, or flare) can meet the requirements for continuous monitoring systems with a CO continuous emission monitoring system (CEMS).

Table 8 to Subpart UUU of Part 63—Organic HAP Emission Limits for Catalytic Cracking Units

For each new and existing catalytic cracking unit . . .	You shall meet the following emission limit for each catalyst regenerator vent . . .
1. Subject to the NSPS for carbon monoxide (CO) in 40 CFR 60.103	CO emissions from the catalyst regenerator vent or CO boiler serving the catalytic cracking unit must not exceed 500 parts per million volume (ppmv) (dry basis).

Table 9 to Subpart UUU of Part 63—Operating Limits for Organic HAP Emissions From Catalytic Cracking Units

For each new or existing catalytic cracking unit . . .	For this type of continuous monitoring system . . .	For this type of control device . . .	You shall meet this operating limit . . .
1. Subject to the NSPS for carbon monoxide (CO) in 40 CFR 60.103	Continuous emission monitoring system.	Not applicable	Not applicable.

Table 10 to Subpart UUU of Part 63—Continuous Monitoring Systems for Organic HAP Emissions From Catalytic Cracking Units

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For each new or existing catalytic cracking unit . . .	And you use this type of control device for your vent . . .	You shall install, operate, and maintain this type of continuous monitoring system . . .
1. Subject to the NSPS for carbon monoxide (CO) in 40 CFR 60.103.	Not applicable	Continuous emission monitoring system to measure and record the concentration by volume (dry basis) of CO emissions from each catalyst regenerator vent.

Continuous compliance with Organic HAP emission limits is demonstrated as described in Table 13 (the same as the NSPS J CO limit); collecting the hourly average CO monitoring data and maintaining the hourly average CO concentration at or below 500 ppmv(dry basis). Table 14 shows that since there are no operating limits (per Table 9), continuous compliance is demonstrated solely by the criteria in Table 13.

Table 13 to Subpart UUU of Part 63—Continuous Compliance With Organic 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 . . .	If you must . . .	You shall demonstrate continuous compliance by . . .
1. Subject to the NSPS for carbon monoxide (CO) in 40 CFR 60.103	CO emissions from your catalyst regenerator vent or CO boiler serving the catalytic cracking unit must not exceed 500 ppmv (dry basis).	Continuous emission monitoring system	Collecting the hourly average CO monitoring data according to §63.1572; and maintaining the hourly average CO concentration at or below 500 ppmv (dry basis).

Table 14 to Subpart UUU of Part 63—Continuous Compliance With Operating Limits for Organic HAP Emissions From Catalytic Cracking Units

For each new existing catalytic cracking unit . . .	If you use . . .	For this operating limit . . .	You shall demonstrate continuous compliance by . . .
1. Subject to NSPS for carbon monoxide (CO) in 40 CFR 60.103	Continuous emission monitoring system.	Not applicable	Complying with Table 13 of this subpart.

## **COMPARISON OF OMMP PLAN SUBMITTAL TO REQUIREMENTS**

The OMMP plan submitted by the facility was compared against the OMMP requirements for the compliance options selected. A summary of the plan checklist is provided below in **Table P2**. For each applicable plan requirement, compliance with the plan requirement is assessed via a checkmark in the “yes” or “no” column, and remarks are provided with details from the facility’s plan.

**Table P2. Checklist for Subpart UUU Compliance Plan**

Subpart UUU OMMP Requirement* [§ 63.1574(f)(2)]	Compliance?		Remarks
	Yes	No	
(i) Process and control device parameters to be monitored for each affected source, along with established operating limits.	√		Monitoring coke burn-off rate using CPMS (maintaining ≤1 lb PM/1000 coke burn-off) Monitoring opacity with COMS (maintaining ≤30%) Monitoring CO with CO CEMS (maintaining ≤500 ppmv, dry basis).



(ii) Procedures for monitoring emissions and process and control device operating parameters for each affected source.	√	Coke burn-off monitored every 15 min, with hourly averages, and daily average recorded for compliance. Opacity monitored continuously, with 6-minute averages recorded for compliance. CO monitored at least every 15 minutes, hourly averages recorded for compliance.
(iii) Procedures that you will use to determine the coke burn-rate...	√	Equation 1 at 40CFR63 §63.1564.
(viii) Monitoring schedule, including when you will monitor and when you will not monitor an affected source (e.g., during the coke burn-off, regeneration process).	√	Monitoring conducted continuously when the FCCU is in operation.
(ix) Quality control plan for each continuous opacity monitoring system and continuous emission monitoring system you use to meet an emission limit in this subpart. This plan must include procedures you will use for calibrations, accuracy audits, and adjustments to the system needed to meet applicable requirements for the system.	√	Follow manufacturer recommendations for CO, CO <sub>2</sub> & O <sub>2</sub> CPMS. QA/QC per Performance Specification 1, Procedure 1 QA/QC per Performance Specification 4, 40CFR60 Appendix F
(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.	√	Preventive maintenance weekly (COMS), monthly (CO CEMS), or as necessary based on performance (CO, CO <sub>2</sub> and O <sub>2</sub> monitors)

\*Note that requirements (iii), (iv) and (vii) apply only to CCU plans; requirement (iv) applies only to facilities using the equilibrium catalyst Ni concentration compliance option for CCUs; and requirement (vii) applies only if an alternative procedure for gas flow rate based on air flow rate and temperature is used.

Requirements (v), (vi), (xi), and (xii) apply only to CRU plans; requirement (v) applies only if pH strips are being used; requirement (xi) applies only if a fixed-bed gas-solid adsorption system is used; and requirement (xii) applies only if no control device (such as a flare) is used.

**Table P2** indicates that the facility has submitted all of the necessary information for the OMMP, and is in compliance with the plan requirements.

**RECOMMENDATIONS**

The 40CFR63 Subpart UUU Operation, Maintenance and Monitoring Plan for FCCU submitted by Tesoroff has been evaluated and found to comply with the applicable requirements specified in the regulation, as summarized below in **Table P3**.

**Table P3. Summary of 40CFR63 Subpart UUU Operation, Maintenance and Monitoring Plan for Catalytic Cracking Unit**

	Requirements for Emissions of Metal HAP (PM as surrogate)	Requirements for Emissions of Metal HAP (Opacity as surrogate)	Requirements for Emissions of Organic HAP (CO as surrogate)
Compliance option	Subject to NSPS	Subject to NSPS	Subject to NSPS
Parameters to be monitored	Coke burn-off rate (calculated per Equation 1 in 63.1564(b)(4)(i) using CPMS)	Opacity using COMS	CO concentration using CO CEMS

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**Table P3. Summary of 40CFR63 Subpart UUU  
Operation, Maintenance and Monitoring Plan for Catalytic Cracking Unit**

	Requirements for Emissions of Metal HAP (PM as surrogate)	Requirements for Emissions of Metal HAP (Opacity as surrogate)	Requirements for Emissions of Organic HAP (CO as surrogate)
Emission limits	Coke burn-off rate: <1 lb PM/1000 lbs coke burn-off	Opacity <30% (except one 6-min avg per hour can exceed)	CO <500 ppmv, dry basis
Operating Parameter Limit	Not applicable	Not applicable	Not applicable
Monitoring Procedure (Emissions)	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	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	Collecting the hourly average CO monitoring data according to §63.1572; and maintaining the hourly average CO concentration at or below 500 ppmv (dry basis)
Monitoring Schedule	Continuously when FCCU is in operation	Continuously when FCCU is in operation	Continuously when FCCU is in operation
QA/QC	Per manufacturer recommendation	Per Performance Specification 1 [40CFR60 Appendix B], Procedure 1[40CFR60 Appendix F]	Per Performance Specification 4 [40CFR60 Appendix B], Procedure 1[40CFR60 Appendix F]
Maintenance Schedule	Per manufacturer recommendation	Per manufacturer recommendation	Per manufacturer recommendation
bypass lines	None	None	None

Approval of this plan, and inclusion in Section I of the facility's Title V Facility Permit is recommended, subject to the following conditions:

1. Operate at all times according to the procedures in your OMMP.
2. Maintain records to document conformance with the procedures in your OMMP.
3. Submit changes to this OMMP for approval by the Executive Officer [§63.1574(f)(1)].