



## **How the New Subpart Ja Regulations will Affect Your Refinery**

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The New Source Performance Standards ("NSPS") for Petroleum Refineries, Subpart J, 40 C.F.R. 60.100 were recently revised and new NSPS standards for Petroleum Refineries, Subpart Ja, 40 C.F.R. 60.100a, for which construction, reconstruction, or modification commenced after May 14, 2007 were promulgated on June 24, 2008<sup>1</sup>.

### **Background and Legal Status**

The background for the development of the regulations is as follows:

**1. EPA was required to perform a review of NSPS Subpart J rules pursuant to a consent decree: *Our Children's Earth Foundation v. EPA*, No. C 05-00094 CW (N.D. Cal. decree entered October 31, 2005).**

- EPA was required by the Consent Decree to finalize NSPS Subpart J revisions by April 30, 2008
- EPA proposed amendments to NSPS Subpart J and proposed new Subpart Ja on May 14, 2007 (72 Fed. Reg. 27278); extended public comment period.

**2. Revisions to Subpart J and promulgation of new NSPS Subpart Ja were signed by the EPA Administrator on April 30, 2008.**

**3. On June 9, 2008 EPA Administrator issued a memorandum on *"Inadvertent Errors in the Final Amendments to the New Source Performance Standards for Petroleum Refineries (NSPS***

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<sup>1</sup> Federal Register, 73 FR 35838, June 24, 2008.



***Subpart J) and the Newly Promulgated New Source Performance Standards for Petroleum Refineries (NSPS Subpart Ja)", (Attachment #1).***

- EPA acknowledges an error in establishing applicability date for flare gas minimization requirements that were not included in the original proposed rule.
- Because of EPA's error, flares that would not have been affected sources under the proposed rule would be subject to the new Subpart Ja requirements as of the date of the proposal, (May 14, 2007). EPA chose to fix this problem by altering the final rule to provide that *only flares commencing construction, reconstruction, or modification after the date of promulgation of the final rule would be subject to the new Subpart Ja requirements.*
- To avoid a "gap" in coverage, EPA, however, elected to change the amended Subpart J requirements (after issuance) so that flares that were new, modified, or reconstructed between the proposal date and the final date would be subject to fuel gas combustion unit standards in Subpart J rather than no requirements at all.

EPA also acknowledged a second error:

- Under the final NSPS Subpart Ja requirements, venting additional streams of combustible gases into an existing flare system for safety reasons or physically altering flare to increase flow capacity would make the existing flare system a "modified" source. *(This is a particularly controversial change for industry because EPA has not predicated the definition a flare modification on an increase in emission rate as is generally necessary for applicability of NSPSs. See 40 C.F.R. §60.14(a), (Attachment #2). There also are statutory issues with this definition. See 42 U.S.C. §7411(a)(4), (Attachment #3).*
- Therefore, such existing flare system would be immediately subject to the Subpart Ja flare requirements at startup. EPA acknowledges that delaying such venting to allow



time for compliance with the new flare gas minimization requirements could result in unsafe operating conditions.

- In addition, for cost-effectiveness reasons, immediate upgrades to meet the new flare gas minimization requirements would not be Best Demonstrated Technology (“BDT”).
- Consequently, EPA chose to alter the final rule (after issuance) to allow for sequencing compliance for modified flares after June 24, 2008.
- New and reconstructed flares after June 24, 2008, however, are required to comply upon start-up.
- Affected flares must comply with the final hydrogen sulfide (“H<sub>2</sub>S”) limitations immediately upon startup with all other flare minimization requirements within one (1) year of startup.
- With the June 9, 2008 memorandum, EPA also included redline text of the rule to show the post-issuance revisions, (*Attachment #4*).

**4. EPA subsequently published a 60-day stay for implementation of Subpart Ja on the grounds that the effective date published in the June 24, 2008 Federal Register was “incorrect”.**

- Subpart Ja is a “major rule” under the Congressional Review Act (“CRA”) meaning that it will or will likely result in: 1) an annual effect on the economy of \$100,000,000 or more; 2) a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions; or 3) significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic and export markets. (5 USC 804(2)).



- Section 801 of the CRA precludes a “major rule” from taking effect until the later of 60 days after the date of publication in the Federal Register or 60 days after each House of Congress and the Comptroller General receive a copy of a rule report.
- EPA published the stay in the July 28, 2008 Federal Register<sup>2</sup>, (*Attachment #5*).
- **Effective Date of Subpart Ja stayed until September 26, 2008.**
- The stay does not affect the amendments to Subpart J.
- In a Petition for Reconsideration, NPRA and API requested an additional 90-day stay after the conclusion of EPA’s 60-day stay.

## 5. Industry Response

- NPRA Petition for Reconsideration: According to NPRA, the API/NPRA NSPS Workgroup has commenced meetings with EPA staff during July 2008 in an effort to resolve the major issues (namely the flaring modification and process heater NOx limits) within the time period defined by the stays.
- Petitions for Review—Various parties may file petitions for review in the D.C. Circuit. We will update this topic at the NPRA presentation.

## Affected Facilities for Refineries

The NSPS Subpart J and Subpart Ja Regulations apply only to “affected facilities” as defined in the regulations. The definition of an affected facility is important and one must review each process unit to determine if a unit is grandfathered (not subject to NSPS subpart J or Ja), subject to Subpart J or subject to Subpart Ja.

The Subpart J affected facilities and effective dates include:

1. Fluid Catalytic Cracking Unit Catalyst Regenerator – January 17, 1984 to May 13, 2007;
2. Fuel Gas Combustion Devices (except flares) – June 11, 1973 to May 13, 2007;
3. Flares – June 11, 1973 to June 23, 2008; and

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<sup>2</sup> Federal Register, 73 FR 43626, July 28, 2008.



4. Claus Sulfur Recovery Plants (Design Capacity >20 long tons per day) – October 4, 1976 to May 13, 2007.

The Subpart Ja affected facilities include:

1. Fluid Catalytic Cracking Units – after May 14, 2007;
2. Fluid Coking Units – after May 14, 2007;
3. Delayed Coking Units – after May 14, 2007;
4. Fuel Gas Combustion Devices (except flares) – after May 14, 2007;
5. Flares – after June 24, 2008; and
6. Sulfur Recovery Plants (any size) – after May 14, 2007.

The significant changes between the Subpart J and Subpart Ja affected facilities include two new process units: Fluid Coking Units (“FCU”); and Delayed Coking Units (“DCU”). In addition, instead of just Claus-Sulfur Recovery Units (“SRU”); the Subpart Ja affected facilities include any type of SRU (whether Claus-type or not) and any design capacity of SRU.

## **Subpart J Revisions**

EPA made only a limited number of significant changes to the existing Subpart J regulations. First, EPA modified the definition of “*fuel gas*” to exclude vapors that are collected and combusted in an air pollution control device installed to comply with a wastewater<sup>3</sup> or marine vessel loading<sup>4</sup> emission standard.

Second, EPA finalized exemptions for certain fuel gas streams from all continuous monitoring requirements, including process upset gases, flaring of relief valve leakage, emergency malfunctions, and inherently low sulfur fuel gas streams, (pilot gas , commercial grade product {>30 ppm sulfur}, gases produced by: Hydrogen Plant; Catalytic Reforming Unit; Isomerization Unit; and HF Alkylation). A refiner can exempt other inherently low sulfur fuel gas streams by

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<sup>3</sup> 40 C.F.R. 60.692; 40 C.F.R. 61.343 through 61.348; or 40 C.F.R. 63.647.

<sup>4</sup> 40 C.F.R. 63.651; or 40 C.F.R. 63.652.



submitting an application to EPA. The effected date of the exemption is the date of submission of the application to EPA<sup>5</sup>.

EPA had proposed to amend the definition of “*Claus sulfur recovery plant*” to clarify that the SRP may consist of multiple units and that the primary sulfur pits are considered part of the Claus SRP. EPA decided not to include this change in the Subpart J revisions but expressed in the preamble that this change in definition is and has been EPA’s interpretation.

Refiners should be aware that future EPA inspections may look to see if smaller SRPs (<20 LTD) use a common source of sour gas. EPA explains in the new Subpart Ja regulations that if a multiple SRUs are fed from a common source of sour gas they are to be considered as one SRU.

Third, EPA makes several (16) technical corrections (spelling, references, units, etc.) to the Subpart J regulations.

Also, note that the revised Subpart J regulations are not included in the 60-day stay and were effective on date of proposal, May 14, 2007.

## **Subpart Ja Regulations**

As referenced earlier, the NSPS regulations for refineries were required to be reviewed because of a lawsuit settlement. Because of the extensive changes in the regulations and changes in definitions, EPA was required to develop a new set of regulations that apply to new refineries and modified or reconstructed refineries. EPA proposed the new regulations on May 14, 2007. The public was invited to comment on the regulations and a total of 46 comments were submitted. A complete list of comments submitted and materials EPA used in the preparation

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<sup>5</sup> 40 C.F.R. 60.105(b)(2).



of the regulations can be found in the Docket ID EPA-HQ-OAR-2007-0011<sup>6</sup>. A table of contents of the Docket is included as *Attachment #6* to this paper.

The next section of this paper will summarize the new Subpart Ja regulations, 40 C.F.R. 60.100a – 109a. Please note that NSPS regulations are effective on the date of proposal (May 14, 2007) not on the date of promulgation (June 24, 2008). Where EPA has made revisions since the proposal date, the effective date is generally the date of promulgation. These differences will be highlighted in the paper.

### ***Affected Facilities***

As described earlier, the new Subpart Ja regulations include additional units as affected facilities. The list of Subpart Ja affected facilities includes:

1. Fluid Catalytic Cracking Units – after May 14, 2007;
2. *Fluid Coking Units* – after May 14, 2007;
3. *Delayed Coking Units* – after May 14, 2007;
4. Fuel Gas Combustion Devices (except flares) – after May 14, 2007;
5. Flares – after June 24, 2008; and
6. Sulfur Recovery Plants – after May 14, 2007.

The new affected facilities include the Fluid Coking Unit, the Delayed Coking Unit, and Sulfur Recovery Plants less than 20 LTD. Note, there are also slight differences in the definition of units that may have a significant bearing on your refinery. For Fluid Catalytic Cracking Units (“FCCU”), EPA has added that if 2 FCCU share a common exhaust treatment (e.g., CO Boiler or wet scrubber) the FCCU is a single affected facility.

EPA changed the definition of “Petroleum Refinery” in Subpart Ja to include producing asphalt (bitumen). This change is not expected to have a significant impact on the number of affected Petroleum Refineries.

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<sup>6</sup> <http://www.regulations.gov/fdmspublic/component/main?main=DocketDetail&d=EPA-HQ-OAR-2007-0011>



EPA deleted the definition of Claus Sulfur Recovery Plant and substituted Sulfur Recovery Plant (“SRP”). The definition of SRP now includes all types of SRPs and also includes in the definition the primary sulfur pits. EPA also makes the clarification that SRPs that receive sour gas from the same source are a single affected facility. EPA claims in the preamble that this has been EPA’s interpretation all along; however, I suspect many refiners share a different opinion.

### **Flare Modification**

A very significant change in the definition of modification for flares is included as a new section 40 C.F.R. 60.100a (c)(1) and (c)(2). EPA defines that a modification of a flare occurs if:

1. Any new piping from a refinery process unit or fuel gas system is physically connected to the flare (e.g., for direct emergency relief or some form of continuous or intermittent venting); or
2. A flare is physically altered to increase the flow capacity of the flare.

This change suggests that any change that a refiner makes to a flare system (note: that a flare is now defined to include the piping and header system) will cause the flare to become subject to the Subpart Ja regulations. EPA does grant a 1-year delay of the affected date for flares if they become modified.

EPA has also recently issued an applicability determination<sup>7</sup> that determines that *“Combusting gas streams not previously combusted in the flare is a change in how the flare operates, whether these streams are routed on a routine basis or on an intermittent basis”*, (Attachment #7). The determination suggests that any new stream added to a flare is a change in operation that would result in an increase in emissions.

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<sup>7</sup> Gigliello, Ken, EPA letter to Domike, Julie, Wallace, King, Domike, & Branson, April 10, 2008.





## Reconstruction Cost

Under the Subpart J regulations, the reconstruction cost analysis was based on the capital cost following January 17, 1984. For the Subpart Ja regulations, the reconstruction cost analysis (required by 40 C.F.R. 60.15) is now based upon any two-year period following May 14, 2007.

## Definitions

EPA has made a few critical changes or additions to the definition of several terms including:

- Fuel Gas;
- Flare; and
- Process Upset Gas.

First, as with the Subpart J revisions, EPA modified the definition of “*fuel gas*” to exclude vapors that are collected and combusted in an air pollution control device installed to comply with a wastewater or marine vessel loading emission standard. Fuel gas also does not include gases from FCCU or FCU but does include gases from Flexicoking Unit Gasifiers.

Second, EPA has added the definition of a flare and defines a flare as:

*“an open-flame fuel gas combustion device for burning off unwanted gas or flammable gas and liquids. The flare includes the foundations, flare tip, structural support, burner, igniter, flare controls including air injection or steam injections systems, flame arrestors, knockout pots, piping and header systems.”*

Note, that the flare definition includes “piping and header systems”. This important addition will cause flares to become modified more easily as was described earlier regarding flare modifications.

Third, the definition of process upset gas has been modified. The Subpart J definition of process upset gas included “*gas generated by a petroleum refinery process unit as a result of start-up, shut-down, upset or malfunction*”. The new Subpart Ja definition of process upset gas is: “*any gas generated by a petroleum refinery process unit as a result of upset or malfunction*”.



Note that the gases generated by start-ups or shut-downs are no longer included. This is especially important for flares as the flaring of process upset gases are exempt from the SO<sub>2</sub> emission limits<sup>8</sup>.

### ***Emission Limits***

Shown on Table 1 is a summary of the Subpart Ja emission limits for new affected facilities. Shown on Table 2 is the summary of Subpart Ja emission limits for modified or reconstructed facilities. Rather than discuss each emission limit separately, we will discuss the new requirements that either differ from Subpart J regulations or are new requirements.

### **Fuel Gas Combustion Units**

The Subpart Ja regulation keep the same short-term (3-hour rolling average) SO<sub>2</sub> limits (20 ppm SO<sub>2</sub> or 162 ppm H<sub>2</sub>S). The new regulations however add a long-term (365-day rolling average) of 8 ppm SO<sub>2</sub> or 60 ppm H<sub>2</sub>S. Note that these requirements apply to heaters, boilers, and flares. The Subpart Ja regulations add short-term NO<sub>x</sub> limits for process heaters only. The new short-term (24-hour rolling average) NO<sub>x</sub> limit is 40 ppm and applies to only process heaters with a rated capacity of 40 million BTU per hour (“MMBTU/hr”) or higher.

### **Fluid Catalytic Cracking Units**

The FCCU Subpart J regulation for short-term SO<sub>2</sub> was for one of three options:

1. 50 ppm, 7-day or 90% reduction;

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<sup>8</sup> 40 C.F.R. 60.140(a)(1).

**Table 1  
Summary of Refinery NSPS Subpart Ja Regulations – New Sources**

Issue	New Sources		
	Existing J Standard	Proposed Ja Standard	Final Ja Standard
<b>Fuel Gas Combustion Device (Heater/Boiler/Flare)</b>			
Sulfur Fuel - annual	No Standard	8 ppm - SO <sub>2</sub>	8 ppm SO <sub>2</sub> or <b>60 ppm H<sub>2</sub>S</b>
Sulfur Fuel - 3-hour	160 ppm H <sub>2</sub> S	20 ppm - SO <sub>2</sub>	20 ppm SO <sub>2</sub> or <b>162 ppm H<sub>2</sub>S</b>
NO <sub>x</sub> - 7-day (Process Heater)	No Standard	80 ppm, >20 MMBTU/hr	<b>40 ppm, &gt;40 MMBTU/hr</b>
SO <sub>2</sub> Releases	No Standard	No Standard	<b>RCA (&gt;500 lb-SO<sub>2</sub>/day)</b>
<b>FCCU</b>			
SO <sub>2</sub> - 365-day	No Standard	25 ppm	25 ppm
SO <sub>2</sub> - short term, 7-day	1. 50 ppm, 7-day avg or 90% reduction;	50 ppm, 7-day	50 ppm, 7-day
	2. Pretreat feed to 0.3 wt.% S		
	3. Limit emissions to 9.8 lb-SO <sub>2</sub> /M-lb coke burn		
NO <sub>x</sub> - annual	No Standard	No Standard	No Standard
NO <sub>x</sub> - short term - 7-day	No Standard	80 ppm	80 ppm
CO - 1-hour	500 ppm	500 ppm	500 ppm
PM	1.0 lb-PM/ M-lb coke burn	0.5 lb-PM(M5)/ M-lb coke burn	<b>0.5 lb-PM(M5B or 5F)/ M-lb coke burn</b>
Opacity	30%	No Limit	No Limit
<b>Fluid Coking Unit</b>			
SO <sub>2</sub>	No Standard	Same as FCCU	Same as FCCU
NO <sub>x</sub> - short term - 7-day	No Standard	80 ppm	80 ppm
CO - 1-hour	No Standard	500 ppm	500 ppm
PM	No Standard	0.5 lb-PM(M5)/ M-lb coke	<b>1.0 lb-PM(M5B)/ M-lb coke</b>
Opacity	No Standard	No Standard	No Standard
<b>Sulfur Recovery Plant</b>			
SRP - SO <sub>2</sub> Release	No Standard	No Standard	<b>RCA (&gt;500 lb-SO<sub>2</sub>/day)</b>
Large SRP (>20LTD), with oxidation	>20 LTPD, 99.9%, 250 ppm SO <sub>2</sub>	>20 LTPD, 99.9%, 250 ppm SO <sub>2</sub>	>20 LTPD, 99.9%, 250 ppm SO <sub>2</sub>
Large SRP (>20LTD), with reduction	>20 LTPD, 99.9%, 300 ppm TRS, 10 ppm H <sub>2</sub> S	>20 LTPD, 99.9%, 300 ppm TRS, 10 ppm H <sub>2</sub> S	>20 LTPD, 99.9%, 300 ppm TRS, 10 ppm H <sub>2</sub> S
Small SRP (<20LTD), with oxidation	No Standard	< 20 LTPD 99.0%, 2,500 ppm SO <sub>2</sub>	< 20 LTPD 99.0%, 2,500 ppm SO <sub>2</sub>
Small SRP (<20LTD), with reduction	No Standard	< 20 LTPD 99.0%, 3,000 ppm TRS, 100 ppm H <sub>2</sub> S	< 20 LTPD 99.0%, 3,000 ppm TRS, 100 ppm H <sub>2</sub> S
<b>Delayed Coking Unit</b>			
SO <sub>2</sub> and VOC	No Standard	Depressure to 5 psig to fuel gas system	Depressure to 5 psig
<b>Flare Gas Minimization</b>			
Flow	No Standard	No routine flaring	<b>Flow &lt; 250,000 SCFD, 30-day, minimize startup shutdown emissions</b>
SO <sub>2</sub> , NO <sub>x</sub> , VOC	No Standard	No routine flaring, SSM plan and RCA (>500 lb/day)	<b>Flare minimization plan, RCA (&gt;500 lb/day)</b>

**Table 2**  
**Summary of Refinery NSPS Subpart Ja Regulations – Modified and Reconstructed Sources**

Issue	Modified and Reconstructed Sources		
	Existing Standard	Proposed Standard	Final Standard
<b>Fuel Gas Combustion Device (Heater/Boiler/Flare)</b>			
Sulfur Fuel - annual	N/A	8 ppm - SO <sub>2</sub>	8 ppm SO <sub>2</sub> or <b>60 ppm H<sub>2</sub>S</b>
Sulfur Fuel - 3-hour	160 ppm H <sub>2</sub> S	20 ppm - SO <sub>2</sub>	20 ppm SO <sub>2</sub> <b>162 ppm H<sub>2</sub>S</b>
NO <sub>x</sub> - 7-day (Process Heater)	No Standard	80 ppm, >20 MMBTU/hr	<b>40 ppm, &gt;40 MMBTU/hr</b>
SO <sub>2</sub> Releases	No Standard	No Standard	<b>RCA (&gt;500 lb-SO<sub>2</sub>/day)</b>
<b>FCCU</b>			
SO <sub>2</sub> - annual	No Standard	25 ppm	25 ppm
SO <sub>2</sub> - short term - 7-day	1. 50 ppm, 7-day avg or 90% reduction;	50 ppm, 7-day	50 ppm, 7-day
	2. Pretreat feed to 0.3 wt.% S		
	3. Limit emissions to 9.8 lb-SO <sub>2</sub> /M-lb coke burn		
NO <sub>x</sub> - annual	No Standard	No Standard	No Standard
NO <sub>x</sub> - short term - 7-day	No Standard	80 ppm	80 ppm
CO - 1-hour	500 ppm	500 ppm	500 ppm
PM	1.0 lb-PM/ M-lb coke	0.5 lb-PM(M5)/ M-lb coke	<b>1.0 lb-PM (M5B or F)/ M-lb coke burn</b>
Opacity	30%	No Limit	No Limit
<b>Fluid Coking Unit</b>			
SO <sub>2</sub>	No Standard	Same as FCCU	Same as FCCU
NO <sub>x</sub> - short term - 7-day	No Standard	80 ppm	80 ppm
CO - 1-hour	No Standard	500 ppm	500 ppm
PM	No Standard	0.5 lb-PM(M5)/ M-lb coke	<b>1.0 lb-PM(M5B)/ M-lb coke</b>
Opacity	No Standard	No Standard	No Standard
<b>Sulfur Recovery Plant</b>			
SRP - SO <sub>2</sub> Release	No Standard	No Standard	<b>RCA (&gt;500 lb-SO<sub>2</sub>/day)</b>
Large SRP (>20LTD), with oxidation	>20 LTPD, 99.9%, 250 ppm SO <sub>2</sub>	>20 LTPD, 99.9%, 250 ppm SO <sub>2</sub>	>20 LTPD, 99.9%, 250 ppm SO <sub>2</sub>
Large SRP (>20LTD), with reduction	>20 LTPD, 99.9%, 300 ppm TRS, 10 ppm H <sub>2</sub> S	>20 LTPD, 99.9%, 300 ppm TRS, 10 ppm H <sub>2</sub> S	>20 LTPD, 99.9%, 300 ppm TRS, 10 ppm H <sub>2</sub> S
Small SRP (<20LTD), with oxidation	No Standard	< 20 LTPD 99.0%, 2,500 ppm SO <sub>2</sub>	< 20 LTPD 99.0%, 2,500 ppm SO <sub>2</sub>
Small SRP (<20LTD), with reduction	No Standard	< 20 LTPD 99.0%, 3,000 ppm TRS, 100 ppm H <sub>2</sub> S	< 20 LTPD 99.0%, 3,000 ppm TRS, 100 ppm H <sub>2</sub> S
<b>Delayed Coking Unit</b>			
SO <sub>2</sub> and VOC	No Standard	Depressure to 5 psig to fuel gas system	Depressure to 5 psig
<b>Flare Gas Minimization</b>			
Flow	No Standard	No routine flaring	<b>Flow &lt; 250,000 SCFD, 30-day, minimize startup shutdown emissions</b>
SO <sub>2</sub> , NO <sub>x</sub> , VOC	No Standard	No routine flaring, SSM plan and RCA (>500 lb/day)	<b>Flare minimization plan, RCA (&gt;500 lb/day)</b>



2. Pretreat FCCU feed to 0.3 weight % sulfur; or
3. 9.8 lb-SO<sub>2</sub> per 1,000 pounds of coke burned (lb-SO<sub>2</sub>/M-lb coke burn).

The new short-term SO<sub>2</sub> limit is only the 50 ppm<sup>9</sup> (7-day rolling average). The new regulations have added a long-term SO<sub>2</sub> limit of 25 ppm (365-day rolling average). The regulations have also added a short-term NO<sub>x</sub> limit of 80 ppm (7-day rolling average). The short-term CO limit of 500 ppm (1-hour rolling average) remains the same. The short-term particulate limit for new sources has been lowered to 0.5 lb-PM/M-lb coke burn (0.020 grains per dry standard cubic foot [“gr/dscf”] if using a CEMs). The limit for modified or reconstructed sources remains at 1.0 lb-PM/M-lb coke burn, (0.040 gr/dscf if using a CEMs).

Both of the Subpart Ja PM limits allow the use of either Method 5B or Method 5F. These methods do not include the condensable PM fraction that is measured in Method 5. EPA had originally proposed requiring the use of Method 5, however after numerous adverse comments about the use of Method 5, EPA changed the requirement to either Method 5B or 5F. EPA has indicated that it intends to perform more work to analyze Method 5 and also Method 202. The suggestion is that in the future EPA will revise the PM standard to include the condensable fraction.

One change in the method of calculating the PM emissions is the coke burn equation. EPA has added a term to account for any oxygen enrichment used in the FCCU. EPA had previously not accounted for the added enrichment oxygen in the coke burn equation. The coke burn equations in Subpart J and Subpart Ja are now equivalent to the equations used in the Refinery MACT regulations.

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<sup>9</sup> All SO<sub>2</sub>, NO<sub>x</sub>, CO, H<sub>2</sub>S, and reduced sulfur emission limits are each corrected to a dry, 0% excess air (by volume). PM is corrected to 0% excess air.



## **Fluid Coking Unit**

EPA has added a new process unit emission limit for Fluid Coking Units (“FCU”). The emission limits are similar to the FCCU limits. The SO<sub>2</sub> emission limits are identical (i.e., 25 ppm 365-day rolling average and 50 ppm 7-day rolling average). The NO<sub>x</sub> emissions limit, (80 ppm 7-day rolling average) and CO limit (500 ppm 1-hour rolling average) are also identical to the FCCU limits. The PM emission limit for new and for modified or reconstructed FCU is 1.0 lb-PM/M-lb coke burn. There are no FCU standards for opacity.

## **Sulfur Recovery Plant**

As mentioned previously, EPA has modified the definition of SRP to include non-Claus SRP and to include all capacities of SRP. In addition, all SRPs that share the same source of sour gas are accumulated to determine whether the greater than 20 long ton per day (“>20 LTD”) regulations apply or the less than 20 LTD (“<20 LTD”) apply. For each size of SRP, EPA requires tail gas treatment using either an oxidation system or a reducing system. For >20 LTD SRPs, the regulations are the same as they were for Subpart J. Oxidation systems are limited to 250 ppm SO<sub>2</sub> (~99.9% sulfur removal). Reducing systems are limited to 300 ppm reduced sulfur compounds and 10 ppm H<sub>2</sub>S.

The <20 LTD SRP emission limits were not required in the Subpart J regulations. The new Subpart Ja emission limits for oxidation systems are 2,500 ppm SO<sub>2</sub> (~99.0% sulfur removal). The reducing system limits are 3,000 ppm reduced sulfur compounds and 100 ppm H<sub>2</sub>S.

The SRP emission limits now contain a factor to include the effect of oxygen enrichment. This factor was not used in the previous Subpart J regulations.

## ***Work Practice Standards***

EPA has added three work practice standards to reduce VOC, NO<sub>x</sub>, and SO<sub>2</sub> emissions from delayed coker units, flares, and sulfur recovery units. Note that VOCs are now regulated by



Subpart Ja and therefore must be considered when determining whether a modification has occurred.

### **Delayed Coker Unit**

EPA has added a work practice standard for delayed coker units (“DCU”) to depressure to 5 pounds per square inch gauge (“psig”) during reactor vessel depressuring. The exhaust gases are to be vented to the fuel gas system or to a flare.

### **Flare Management Plan**

The flare minimization work practice standard requires each flare that is subject to Subpart Ja to prepare a Flare Management Plan (“FMP”). New and reconstructed flares are required to be in compliance upon startup. Modified flares are subject 1 year after the flare becomes subject to the Subpart Ja regulations.

The FMP requires the following items:

1. Diagram showing all connections to the flare;
2. Methods for monitoring flow rate to the flare;
3. Procedures to minimize discharges to the flare during start-up and shut-down;
4. Procedures to conduct a root cause analysis (“RCA”) of any process upset or malfunction that causes a discharge of more than 500,000 SCFD to the flare;
5. Procedures to reduce flaring in cases of excess fuel gas; and
6. Explanation of the procedures to follow during times the flare exceeds the 250,000 SCFD limit.

### **Emission Limit Exceedance**

The new regulations require that any time a fuel gas combustion device or a SRP, subject to Subpart Ja, causes a release of more than 500 lb-SO<sub>2</sub>/day, a RCA must be performed. Of special note, many Refinery Consent Decrees require the refinery to perform a similar RCA for either a



Flaring Incident or a Hydrocarbon Flaring Incident. Each of the Consent Decree incidents must occur at a flare for a RCA to be performed. For the new Subpart Ja regulations, the requirement is expanded to also include fuel gas combustion devices (process heaters and boilers are added) and SRPs. The RCA is to include:

1. Identification of the affected facility;
2. Date and duration of the discharge;
3. Results of the RCA; and
4. Corrective Action taken because of the RCA.

As EPA has expressed in many of the Refinery Consent Decree negotiations, the Corrective Action taken because of performing a RCA is expected to eliminate the cause of the release from occurring in the future. If the cause of the release occurs again, one can expect EPA to become involved and enter into a negotiated settlement incurring penalties and injunctive relief.

### ***Performance Tests***

Regulation 40 C.F.R. 60.104a details the performance tests required to satisfy the initial compliance with each applicable emission limit and subsequent performance tests. The affected facility must provide EPA with a 30-day notice prior to the performance test as detailed in 40 C.F.R. 60.8(d). The FCCU and FCU PM performance tests must be performed once every 12 months.

### ***Monitoring of Emissions***

Regulations 40 C.F.R. 105a, 106a, and 107a provide detailed requirements for the monitoring of emissions to demonstrate continuous compliance with the emission limits. These regulations are very prescriptive and must be followed exactly to maintain compliance. The regulations require either parametric monitoring of specified operating parameters or direct continuous emission monitoring. In general, the continued expansion in the use of continuous emission





systems (“CEMs”) will occur. Of note, process heaters with a rated design of less than 100 MMBTU/hr can use parametric monitoring rather than CEMs to satisfy the NO<sub>x</sub> monitoring requirements. Also of note is that affected flares will need to be monitored for SO<sub>2</sub> or H<sub>2</sub>S and for flow.

### ***Greenhouse Gases***

Several of the commenters stated that the NSPS regulations for refiners needed to include limits to greenhouse gases (“GHG”) such as carbon dioxide (“CO<sub>2</sub>”) and methane (“CH<sub>4</sub>”). While there is now an argument to be made that GHG are to be regulated because of the *Massachusetts v. EPA* Supreme Court decision, EPA states that it is not reasonable to regulate refinery GHG at this time. EPA states that the GHG regulation strategy must be determined first for the nation before individual source categories can be regulated. As the Subpart Ja regulations are to be reviewed in eight years (2016), look for GHG regulations specific to refineries in the next review.



## Summary

The new Subpart Ja regulations have immediately been the source of much discussion and expected litigation. We expect that these regulations will be litigated and probably revised as a result of this litigation. This regulation and subsequent revisions will be followed by the writers. If you have any questions about this regulation or Subpart J regulations, please feel free to contact the writers directly. Our contact information is included below.

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*Disclaimer: The information provided in this presentation is intended solely as an educational resource, does not constitute legal advice, and should not be used as a substitute for careful review of the rulemaking action itself and consultation with competent legal and technical professionals as to site-specific circumstances.*

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