

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING & COMPLIANCE APPLICATION PROCESSING AND CALCULATIONS	PAGE 1 Appl. Nos.: Processed by: Checked by: Date:	of 7 pages 515123 Ngoc Tran 10/20/11
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PERMIT TO CHANGE OF CONDITION for:

HEATER 19F-1, AN 515123

COMPANY NAME: EXXONMOBIL OIL CORP.
COMPANY ID: 800089
MAILING ADDRESS: 3700 W. 190th St.
Torrance, CA 90509-2929
EQUIPMENT LOCATION: Same as above

I. EQUIPMENT DESCRIPTION: SECTION D

Equipment	ID No.	Connected To	RECLAIM	Emissions* And Requirements	Conditions
Process 5: CATALYTIC REFORMING UNIT					P13.1
System 5: PLATFORMER NO. 2 HEATING SYSTEM					
HEATER, PLATINUM REFORMER NO. 2 REACTOR CHARGE, 19F-1, NATURAL GAS, REFINERY GAS, WITH LOW NOX BURNER, 288 MMBTU/HR WITH A/N: 278853 515123 BURNER, FIFTY-TWO LO-NOX, NATURAL GAS, REFINERY GAS, WITH LOW NOX BURNER, 50 TOTAL; 288 MMBTU/HR	D924	<u>Sx1</u> , C301	NOX: MAJOR SOURCE**; SOX: MAJOR SOURCE**	CO: 2000 PPMV (5) [RULE 407, 4-2-1982]; PM: (9) [RULE 404, 2-7-1986]; PM: 0.1 GRAINS/SCF (5) [RULE 409, 8-7-1981]	D328.1, E193.16, <u>E448.x4</u> , H23.13
<u>STACK, HEATER 19F-1 BYPASS STACKS, NORMALLY CLOSED, EQUIPPED WITH DAMPER POSITION MONITOR, LOCATED UPSTREAM OF NH3 INJECTION GRIDS & SCR, 2 TOTAL</u> A/N: 515123	<u>Sx1</u>	<u>D924</u>			<u>E448.x4</u>
FUGITIVE EMISSIONS, MISCELLANEOUS A/N: 278853 515123	D2371			HAP: (10) [40CFR 63 Subpart CC, #5A, 6-23-2003]	H23.34

II.BACKGROUND:

The permitting history of the Heater 19F-1 served the platinum reforming unit No. 2 is as follows:

08/03/92: PC AN 258220 issued to modify the heater by venting to the newly installed 1) SCR with associated anhydrous NH3 injection system and 2) a stack to comply with R1109 requirements. NH3 is injected at 550⁰F. PO D92475 was issued on 7/28/95.

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07/28/95: PO D92476 (AN 278853) issued to change of startup/shutdown condition to include:

- Bypass SCR at temperature lower than 550⁰F and 2) 288 hours maximum.
- Maximum firing rate is 288 MMBtu/hr.
- Heater shall be operated to receive off gases resulting from the catalytic regeneration of any reactor catalyst bed of Platinum reformer No. 2, except during hydrogen (H₂) purging operations.

Pending applications:

06/27/06: An application was submitted (AN 458254) to address 40CFR60 Subpart J requirements. Since this heater also receives the vent stream from the catalyst regeneration activities, an Alternate monitoring plan (AMP) condition should be included. This application will be evaluated separately.

04/30/10: EM submitted two applications for crude heaters (1F-1 & 1F-2) per District's requirement (**Attachment 1 – District's email dated 4/16/10**). EM, however, refused to submit an application for this heater (19F-1) claiming that the bypass stacks are only opened when the fuel is shut off.

09/23/10: AN 515123 was submitted for this heater (19F-1) per District's requirement to address 1) the monitoring of the dampers' close/open position and 2) install and maintain an automatic fuel shutoff system (**Attachment 2 – District's email dated 8/4/2010**).

10/06/11: Final Condition E448.x4 for 19F-1 bypass stacks operations monitoring received from management to impose this condition in the TV/FP (**Attachment 3**). EM's determination of the opening of the bypass stack dampers during the shutoff of the burners forms the basis to impose this condition. It's noted that this evaluation does not cover the abnormal refinery operations such as startup, shutdown, and malfunction when the NOx emissions are not controlled due to no NH₃ injection to the SCR.

III. ENFORCEMENT RECORD REVIEW:

There was no NOV or NC issued to this heater in the past two years.

IV. PROCESS DESCRIPTION:

Platinum catalytic reforming (platforming) Unit #2 Heating System:

There are two platinum reforming process units at EM Torrance refinery (Units 1 & 2) that produce the reformate gasoline, which is rich in aromatic compounds, as a gasoline blend stock. Such aromatic compounds shall be reduced under the reformulate gasoline effective 1/1/95, resulting in the shutdown of Unit 1. Unit 1 reactor charge heater was put in the non-operating mode on 1/22/01 (Heater 20F-2, Device D922), leaving only Unit 2 in service.

Unit 2 consists of four reactors in series and is categorized as semi-regenerative process that each reactor's catalyst can be regenerated independently. As such, individual reactor is temporary shutdown instead of shutting down the entire process unit.

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In the platforming process, the feed stream of light petroleum distillate (hydrodesulfurized naphtha) is contacted with a platinum-containing catalyst at elevated temperatures and pressures. Reformate gasoline produced from the platforming is a high-octane liquid and rich in aromatic compounds. Byproducts include hydrogen, light gas, and LPG.

Heater 19F-1 was installed to serve Unit 2 platforming process unit by heating up the feed stream before routing to the reactor. Because the reactions are endothermic, the reactor section is separated into several stages, or reactors. Inter-heaters are installed between these stages to maintain the desired temperature across all the catalyst in the reactor section. Heater 19F-1 actually consists of three individual heaters serving three separate stages with four reactors (there are two reactors in the third stage).

The three heaters are built next to each other with different designed heat duties namely 19F-1A, 19F-1B, and 19F-1C. Each heater serves one stage of the platforming process unit. For catalyst regeneration, both heater and stage's reactor can be shutdown separately as per the semi-regeneration design. There was one permit issued to all three heaters. Originally, these three heaters were equipped with two common stacks. (It's noted that this evaluation does not cover the splitting of three-heater combined permit into three separate permits).

Prior to 1992, the combustion emissions from the heaters had not been controlled as being released directly to the atmosphere through the two common stacks. In 1992, in order to comply with NOx emissions reductions required by R1109, a common SCR and associate stack (main stack) were installed serving the three heaters. The two existing common stacks were closed by dampers, but not demolished. The schematic of these three heaters and three stacks is shown in [Attachment 4](#). Without a NOx monitoring system, EM occasionally opens these two bypass stacks dampers when the burners are shut off.

Condition E448.x4 will be imposed through this evaluation to address 1) no opening of the bypass stacks dampers when the heater is in operation and 2) the installation of an automatic fuel shut off system with associated notification, monitoring, recording, and reporting requirements.

V. EMISSIONS CALCULATIONS:

The maximum firing rate of three combined heaters is 288 MMBtu/hr and will not be changed through this evaluation. During the opening of the two existing bypass SCR stack, the fuel gas will be shutoff. Emissions are not required to be recalculated for this evaluation.

VI. RULE EVALUATIONS:

Rule 212: R212(c)(1):

The equipment is not located within 1000 feet from the boundary of a school. Therefore, public notice required under R212(c)(1) does not apply.

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R212(c)(2):

The opening of the bypass stacks dampers when the fuel is shutoff does not result in an emission increase exceeding any of the daily limits specified under R212(g) under normal operating conditions. Therefore, public notice required under R212(c)(2) does not apply.

R212(c)(3):

The opening of the bypass stacks dampers when the fuel is shutoff does not result in the toxic emission increase under normal operating conditions. Therefore, public notice required under R212(c)(3) does not apply.

R212(g):

The opening of the bypass stacks dampers when the fuel is shutoff does not result in an emission increase exceeding any of the daily limits specified under R212(g) under normal operating conditions. Therefore, public notice required under R212(g) does not apply.

Rule 401: With proper operation and maintenance of the heaters, opacity is not expected.

Rule 402: With proper operation and maintenance of the heaters, nuisance is not expected.

Rule 407: Compliance with R407 limit for CO at 2000 ppmv is expected under normal operating condition.

R409: Compliance with R409 limit of PM at 0.1 gr/scf is expected under normal operating condition.

Regulation IX – New Source Performance Standards (NSPS):

40CFR60 Subparts A & J – Fuel gas combustion device: Under the Consent Decree (CD) ordered by the EPA on 12/13/06, Heater 19F-1 be subject to 40CFR60 Subpart A & J requirements as follows:

Heater 19F-1	Subpart, Section	Requirements	Compliance/ Conditions
Refinery fuel gas from mix drum 64C-4	A J, 60.104(a)(1) J, 60.105(a)(3) J, 60.105(a)(4)	General provisions Limit 160 ppm H2S content in fuel gas Monitoring of SOx at stack, or H2S content in fuel gas	E193.16 B61.3*, H23.13 D90.x12*
Off gas from reactor's catalyst regeneration		Alternative monitoring plan approved by EPA	D90.x12*

*To be determined in separate evaluation for AN 458254.

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Regulation XIII – New Source Review (NSR):

This change of condition does not result in an emission increase of any nonattainment air contaminant, any ozone depleting compound, or ammonia under normal operating conditions. Therefore, Reg XIII does not apply.

Rule 1401: This change of condition does not result in an increase of toxic compound under the normal operating conditions, Rule 1401 does not apply.

Reg XVII – PSD:

This change of condition does not result in an emission increase of any attainment air contaminants (NO_x, SO_x, CO, or lead) in the South Coast Air Basin under normal operating conditions. Therefore, Reg XVII does not apply.

R2011: These three heaters are subject to R2011 as SO_x major sources. To comply with monitoring requirements of this rule, EM utilizes ACEM SO_x monitoring during normal operating conditions.

The two bypass stacks are closed by the dampers. Condition E448.x4 will be imposed requesting notification, monitoring, recording, and reporting during the bypass stacks utilization.

R2012: These three heaters are subject to R2012 as major source. CEMS for NO_x was installed at the main stack after the SCR for NO_x monitoring during normal operating conditions.

The two bypass stacks are closed by the dampers. Condition E448.x4 will be imposed requesting notification, monitoring, recording, and reporting during the bypass stacks utilization.

Reg XXX - Title V Permits:

R3005 – “Permit Revision”:

The initial Title V permit was issued to EM and in effect beginning January 25, 2010. The proposed addition of Condition E448.x4 is treated as Minor Title V revision pursuant to R3005(e). The permit revision does not require public notification under R3006(b), but requires a 45-day review by EPA.

VII. CONCLUSION AND RECOMMENDATION

The 19F-1 heater is expected to comply with all applicable AQMD and federal Rules and Regulations. Permit to operate is recommended subject to the addition of Condition E448.x4 to this heater.

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PROCESS CONDITIONS

P13.1 All devices under this process are subject to the applicable requirements of the following rules or regulations:

<u>Contaminant</u>	<u>Rule</u>	<u>Rule/Subpart</u>
HAPs	40CFR61, SUBPART	FF
[40CFR 61 Subpart FF, 12-4-2003]		

[Processes subject to this condition: 1, 2, 3, 4, 5, 7, 8, 9, 11, 12, 13, 14, 15, 20, 22, 23]

DEVICE CONDITIONS

D328.1 The operator shall determine compliance with the CO emission limit(s) either: (a) conducting a source test at least once every five years using AQMD Method 100.1 or 10.1; or (b) conducting a test at least annually using a portable analyzer and AQMD-approved test method. The test shall be conducted when the equipment is operating under normal conditions to demonstrate compliance with the emission limits. The operator shall comply with all general testing, reporting, and recordkeeping requirements in Sections E and K of this permit.

[RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 407, 4-2-1982]

[Devices subject to this condition : D83, D84, D85, D120, D231, D232, D234, D235, D269, C626, D803, D805, D833, D913, D914, D917, D918, D920, D922, D924, D927, D928, D929, D930, D931, D949, D950, D1236, D1239, D1403]

E193.16 The operator shall operate and maintain this equipment according to the following specifications:

The operator shall comply with all applicable requirements specified in Subpart A of the 40CFR60

[40CFR 60 Subpart A, 5-16-2007; CONSENT DECREE CIVIL CASE No. 05 C 5809, 12-13-2005]

E448.x4 The operator shall comply with the following requirements:

The operator shall maintain the SCR bypass stack dampers for platinum reformer 19F-1 (Device ID D924) at a fully closed position such that no emissions will be exhausted through the bypass stacks whenever fuel is supplied to the heaters.

The operator shall install and maintain damper limit switches or other equivalent device to accurately indicate the fully closed position of the SCR bypass stack dampers.

The operator shall record the position of the dampers at least once every 15 minutes and any time the damper position changes.

The operator shall install and maintain an automatic fuel shutoff system to cut off the fuel supply to the heater whenever any of the bypass stack dampers is not in the fully closed position.

The operator shall maintain records in a manner approved by the District to demonstrate compliance with the requirements specified in this condition.

The District shall be notified of the date and time of each opening of any bypass stack damper(s) for platinum reformer 19F-1 at least 24 hours prior to opening for a planned event or no more than one hour after opening for an unplanned event.

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The District shall be notified of the date, time, duration of each instance of the opening of any bypass stack damper(s) for platinum reformer 19F-1, as well as if fuel was supplied to the heater while a damper was open, within 24 hours of closing the damper(s).

[RULE 2011, 2012, 5-6-2005]

[Devices subject to this condition: D924, Sx1]

H23.13 This equipment is subject to the applicable requirements of the following rules or regulations:

<u>Contaminant</u>	<u>Rule</u>	<u>Rule Rule/Subpart</u>
H2S	40CFR60, SUBPART	J

[40CFR 60 Subpart J, 6-24-2008; CONSENT DECREE CIVIL CASE No. 05 C 5809, 12-13-2005]

[Devices subject to this condition : D83, D84, D85, D120, C164, D231, D232, D234, D235, D269, D367, C626, C686, C687, D803, D805, D833, C891, C892, C894, D913, D914, D917, D918, D920, D922, D924, D927, D928, D929, D930, D931, D949, D950, C952, D1236, D1239, D1403, C1558]

H23.34 This equipment is subject to the applicable requirements of the following rules or regulations:

<u>Contaminant</u>	<u>Rule</u>	<u>Rule/Subpart</u>
VOC	District Rule	1173
VOC	40CFR60, SUBPART	GGGa