

217/782-2113

CONSTRUCTION PERMIT - NSPS SOURCE

PERMITTEE

The Premcor Refining Group
Attn: Bill Irwin
201 East Hawthorne
Hartford, Illinois 62048

Application No.: 01120009

I.D. No.: 119050AAA

Applicant's Designation: TIER2FUELS

Date Received: December 5, 2001

Subject: Tier 2 Project

Date Issued: March 11, 2002

Location: 201 East Hawthorne, Hartford

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of a Tier 2 project, that is, various changes to the refinery to produce lower sulfur gasoline, as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1.0 Unit Specific Conditions

1.1 Unit: Tier 2 Project

1.1.1 Description

The proposed project will allow the refinery to produce lower sulfur gasoline by 2004, as required by the USEPA Tier 2 gasoline sulfur requirements. Reduced sulfur in the fuels will be accomplished by the addition of a new Gasoline Hydrotreater, Unit 671, which will be constructed to further process heavy gasoline blendstock produced by the Fluidized Catalytic Cracking Unit (FCCU). These modifications will not result in an increase in crude throughput.

The new FCC Gasoline Hydrotreater unit will require hydrogen to operate. The hydrogen will come from a new hydrogen plant. The hydrogen plant will provide up to 10 million cubic feet per day of hydrogen. The hydrogen plant will use natural gas as the feedstock to produce the gaseous hydrogen. Emissions result from the heaters that supply the energy for this process.

1.1.2 List of Emission Units and Air Pollution Control Equipment

Emission Unit	Description	Emission Control Equipment
Gasoline Hydrotreater Process Heater	Hydrotreater 2nd Stage Feed Heater (New Process Heater with Ultra-Low NO _x Burners)	Existing flare during upsets
High Pressure Process Boiler	High Pressure Boiler	None
Hydrogen Plant Reformer Heater	Hydrogen Plant	Existing flare during upsets
Fugitives	Fugitive Emissions from New Components Associated with the Tier 2 Project	None

1.1.3 Applicability Provisions and Applicable Regulations

- a. An "affected heater" for the purpose of these unit-specific conditions, is each heater as described in Conditions 1.1.1 and 1.1.2.
 - i.
 - A. This permit is issued based upon the affected heaters being subject to the NSPS for Petroleum Refineries, 40 CFR 60 Subparts A and J. The Illinois EPA administers the NSPS for subject sources in Illinois pursuant to a delegation agreement with the USEPA.
 - B. The Permittee shall not burn in the affected heaters any fuel gas that contains hydrogen sulfide (H₂S) in excess of 230 mg/dscm (0.10 gr/dscf). The combustion in a flare of process upset gases or fuel gas that is released to the flare as a result of relief valve leakage or other emergency malfunctions is exempt from this paragraph [40 CFR 60.104(a)(1)].
 - ii.
 - A. The Permittee shall not cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from the affected heaters except as provided below [35 IAC 212.123(a)].
 - B. The emission of smoke or other particulate matter from the affected heaters may have an opacity greater than 30 percent but not greater than 60 percent for a period or periods

aggregating 8 minutes in any 60 minute period provided that such opaque emissions permitted during any 60 minute period shall occur from only one such emission unit located within a 305 m (1000 ft) radius from the center point of any other such emission unit owned or operated by such person, and provided further that such opaque emissions permitted from each such emission unit shall be limited to 3 times in any 24 hour period [35 IAC 212.123(b)].

- iii. The Permittee shall not cause or allow the emission of carbon monoxide (CO) into the atmosphere from each affected heaters to exceed 200 ppm, corrected to 50 percent excess air [35 IAC 216.121].
 - iv. Operation of the affected heaters during startup or malfunction and breakdown may be allowed pursuant to 35 IAC 201, Subpart I. Further evaluation will take place during the review of the source's CAAPP permit.
- b.
 - i. This permit is issued based upon the high pressure boiler being subject to the NSPS for Industrial-Commercial-Institutional Steam Generating Units, 40 CFR 60 Subparts A and Db. The Illinois EPA administers the NSPS for subject sources in Illinois pursuant to a delegation agreement with the USEPA.
 - ii. The Permittee shall not cause to be discharged into the atmosphere from the high pressure boiler, any gases that contain nitrogen oxides (expressed as NO₂) in excess of 0.2 lb/mmbtu [40 CFR 60.44b(1)(1)].
 - c. This permit is issued based upon new individual drain systems associated with Unit 671 being subject to the NSPS for Standards of Performance for VOC Emissions From Petroleum Refinery Wastewater Systems, 40 CFR 60 Subparts A and QQQ. The Illinois EPA administers the NSPS for subject sources in Illinois pursuant to a delegation agreement with the USEPA. The Permittee shall comply with all applicable requirements of 40 CFR 60, Subpart QQQ.
 - d. This permit is issued based upon the new pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, and flanges or other connectors in VOC service associated with Unit 671 and the Hydrogen

Plant being subject to the NSPS for Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries, 40 CFR 60 Subparts A and GGG. The Illinois EPA administers the NSPS for subject sources in Illinois pursuant to a delegation agreement with the USEPA. The Permittee shall comply with all applicable requirements of 40 CFR 60, Subpart GGG.

1.1.4 Non-Applicability of Regulations of Concern

- a. This permit is issued based on the Gasoline Hydrotreater Process Heater and the Hydrogen Plant Reformer Heater not being subject to 40 CFR 60 Subpart Db, NSPS for Industrial-Commercial-Institutional Steam Generating Units because they are not steam generating units.
- b. The source has addressed the applicability and compliance of 40 CFR 52.21, Prevention of Significant Deterioration (PSD) and 35 IAC Part 203, Major Stationary Sources Construction and Modification. The limits established by this permit are intended to ensure that the modification addressed in this construction permit does not constitute a major modification pursuant to these rules.

1.1.5 Operational and Production Limits and Work Practices

- a. i. The affected heaters shall be equipped, operated, and maintained with ultra low NO_x burners. These burners shall be operated and maintained in conformance with good air pollution control practices.
- ii. The firing rate of the affected heaters shall not exceed the following:

<u>Heater</u>	<u>Firing Rate</u> <u>(mmBtu/Hr, Daily Average)</u>
Gasoline Hydrotreater Process Heater	30.0
High Pressure Process Boiler	190.0
Hydrogen Plant Reformer Heater	113.0

- iii. Only gaseous fuels shall be burned in the affected heaters.
- b. i. These requirements, and the emission limitations in Condition 1.1.6, become effective following completion of the Tier 2 Project when the Refinery first begins to process low-sulfur gasoline for commercial sale.

- ii. Provided the Permittee complies with testing requirements specified in Condition 1.1.7, operation of the units addressed in this permit is allowed until final action is taken on the source's CAAPP permit under this construction permit.

1.1.6 Emission Limitations

- a. i. Emissions from the gasoline hydrotreater process heater shall not exceed the following limits:

<u>Pollutant</u>	<u>Emissions</u>	
	<u>(Ton/Mo)</u>	<u>(Tons/Year)</u>
NO _x	0.22	2.63
SO ₂	0.30	3.54
CO	0.39	4.60
VOM	0.04	0.37
PM/PM ₁₀	0.04	0.40

- ii. Emissions from hydrogen plant reformer heater shall not exceed the following limits:

<u>Pollutant</u>	<u>Emissions</u>	
	<u>(Tons/Mo)</u>	<u>(Tons/Year)</u>
NO _x	0.83	9.90
SO ₂	1.11	13.32
CO	1.45	17.33
VOM	0.12	1.39
PM/PM ₁₀	0.13	1.49

- iii. Emissions from high pressure process boiler shall not exceed the following limits:

<u>Pollutant</u>	<u>Emissions</u>	
	<u>(Tons/Mo)</u>	<u>(Tons/Year)</u>
NO _x	1.39	16.65
SO ₂	1.87	22.39
CO	5.83	69.91
VOM	0.39	4.58
PM/PM ₁₀	0.53	6.33

- b. Emissions of VOM from the new components (i.e., valves, pumps, flanges, etc.) associated with the Tier 2 Project shall not exceed 19.9 tons per year.
- c. Compliance with annual limits shall be determined on a monthly basis from the sum of the data for the

current month plus the preceding 11 months (running 12 month total).

1.1.7 Testing Requirements

a. Hydrogen Sulfide Testing

In accordance with 40 CFR 60.8, within 60 days after achieving the maximum production rate at which the affected heaters will be operated, but not later than 180 days after initial startup of the affected heaters and at such other times as may be required by the Illinois EPA, the Permittee shall conduct performance test(s) in accordance with 40 CFR 60.106(e) and furnish the Illinois EPA a written report of the results of such performance test(s).

Note: The hydrogen sulfide testing requirement is not necessary if the H₂S content of the fuel gas to the affected heaters is monitored by an existing CEM.

b. Nitrogen Oxides Testing for the Gasoline Hydrotreater Process Heater and the Hydrogen Plant Reformer Heater

i. Within 60 days after achieving the maximum production rate at which the affected heaters will be operated, but not later than 180 days after initial startup, the NO_x emissions of the affected heaters shall be measured during conditions which are representative of maximum emissions.

ii. The following methods and procedures shall be used for testing of emissions, unless another method is approved by the Illinois EPA: Refer to 40 CFR 60, Appendix A, for USEPA test methods.

Location of Sample Points	USEPA Method 1
Gas Flow and Velocity	USEPA Method 2
Flue Gas Weight	USEPA Method 3
Moisture	USEPA Method 4
Nitrogen Oxides	USEPA Method 7

The Reference Method listed above refers to the base method or any of its "sub-methods", e.g., Method 2 includes Methods 2, 2A, 2B, 2C, and 2D; Method 3 includes Methods 3 and 3A; and Method 7 includes Methods 7, 7A, 7B, 7C, 7D, and 7E.

c. The Permittee shall comply with the Nitrogen oxides Testing for the High Pressure Process Boiler specified by 40 CFR 60.46b, which requires:

- i. To determine compliance with the emission limits for nitrogen oxides required under 40 CFR 60.44b, the Permittee shall conduct the performance test as required under 40 CFR 60.8 using the continuous system for monitoring nitrogen oxides under 40 CFR 60.48b(b) [40 CFR 60.46b(e)].
- ii. For the initial compliance test, nitrogen oxides from the steam generating unit are monitored for 30 successive steam generating unit operating days and the 30-day average emission rate is used to determine compliance with the nitrogen oxides emission standards under §60.44b. The 30-day average emission rate is calculated as the average of all hourly emissions data recorded by the monitoring system during the 30-day test period.

1.1.1.8 Monitoring Requirements

- a. The Permittee shall comply with the monitoring requirements specified in 40 CFR 60.105 for the affected heaters by installing, calibrating, maintaining and operating either of the following continuous monitoring systems:
 - i. An instrument for continuously monitoring and recording the concentration by volume (dry basis, zero percent excess air) of SO₂ emissions into the atmosphere from each affected heater. The monitor shall include an oxygen monitor for correcting the data for excess air; or
 - ii. An instrument for continuously monitoring and recording the concentration (dry basis) of H₂S in fuel gases before being burned in these affected heaters.
- b. For the affected heaters, the Permittee shall determine compliance with the H₂S standard in 40 CFR 60.104(a)(1) as follows: Method 11, 15, 15A, or 16 shall be used to determine the H₂S concentration in the fuel gas. The gases entering the sampling train should be at about atmospheric pressure. If the pressure in the refinery fuel gas lines is relatively high, a flow control valve may be used to reduce the pressure. If the line pressure is high enough to operate the sampling train without a vacuum pump, the pump may be eliminated from the sampling train. The

sample shall be drawn from a point near the centroid of the fuel gas line [40 CFR 60.106(e)(1)].

Note: The Permittee may use the Relative Accuracy Test Audit (RATA) provided the RATA uses a method specified in Condition 1.1.8(b).

- c. For the affected heaters, the Permittee shall maintain records of the following items to demonstrate compliance with Condition 1.1.3(b)(ii):
 - i. For a SO₂ monitor: a record of the concentration by volume (dry basis, zero percent excess air) of SO₂ emissions into the atmosphere; or
 - ii. For a H₂S monitor: a record of the concentration (dry basis) of H₂S in fuel gases before being burned in the affected heater.
- d. The Permittee shall comply with the Emission Monitoring for Nitrogen Oxides specified in 40 CFR 60.48b, which requires:
 - i. For the high pressure boiler, the Permittee shall install, calibrate, maintain, and operate a continuous monitoring system (CEM), and record the output of the system, for measuring nitrogen oxides emissions discharged to the atmosphere [40 CFR 60.48b(b)(1)].
 - ii. The CEM required by Condition 1.1.8(d)(i) shall be operated and data recorded during all periods of operation of the high pressure boiler except for CEM breakdowns and repairs. Data is recorded during calibration checks, and zero and span adjustments [40 CFR 60.48b(c)].

1.1.9 Recordkeeping Requirements

- a. The Permittee shall maintain records of the following items for the affected heaters:
 - i. Firing rate of the affected heaters (mmBtu/hr on a daily average, based on higher heating value);
 - ii. NO_x, CO, VOM, SO₂, PM and PM₁₀ emissions from the affected heaters (tons/month and tons/year), as determined by methods in Condition 1.1.12(b); and

- b. The Permittee shall maintain records of the following items for fugitive emissions from components:
 - i. Number of new components by unit or location and type in the Tier 2 Project; and
 - ii. Calculated VOM emissions including supporting calculations, attributable to these components (tons/year), based on the methods in Condition 1.1.12(c).

1.1.10 Reporting Requirements

- a. The Permittee shall notify the Illinois EPA of deviations of the affected heaters with the permit requirements as follows. Reports shall describe the probable cause of such deviations, and any corrective actions or preventive measures taken.
- b. For affected heaters, the Permittee shall comply with the reporting requirements specified in 40 CFR 60.107(e) and (f) and 40 CFR 60.105(e)(3).

1.1.11 Operational Flexibility/Anticipated Operating Scenarios

N/A

1.1.12 Compliance Procedures

- a. Compliance with the particulate matter and carbon monoxide emission limitations specified in Conditions 1.1.3(a)(ii) and 1.1.3(a)(iii), respectively, is considered inherent in the normal operation of an affected heater firing refinery fuel gas.
- b.
 - i. Compliance with the SO₂ limits in Condition 1.1.6(a) shall be based on the operating records required by Condition 1.1.9 and the sulfur or H₂S content of refinery fuel gas as monitored in accordance with Condition 1.1.8.
 - ii. Compliance with the other emission limits in Condition 1.1.6(a)(i) and (ii) for the gasoline hydrotreater process heater and the hydrogen plant reformer heater shall be based on the operating records required by Condition 1.1.9 and appropriate emission factors:

<u>Pollutant</u>	<u>Emission Factor (Lbs/mmBtu)</u>
NO _x	0.02
CO	0.035
VOM	0.0028

PM/PM₁₀ 0.003

If available, results from representative stack tests in accordance with the methods described in 1.1.7(b)(ii) or in 40 CFR Part 60, Appendix A shall be used in lieu of this NO_x emission factor to represent actual NO_x emissions.

- iii. Compliance with the CO, VOM and PM/PM₁₀ emission limits in Condition 1.1.6(a)(iii) for the high pressure steam boiler shall be based on the operating records required by Condition 1.1.9 and appropriate emission factors:

<u>Pollutant</u>	<u>Emission Factor</u> <u>(Lbs/mmBtu)</u>
CO	0.084
VOM	0.0055
PM/PM ₁₀	0.0076

- iv. Compliance with the NO_x emission limits in Condition 1.1.6 for the high pressure boiler is demonstrated by continuous monitoring.
- c. Compliance with the emission limits for VOM leaks in Condition 1.1.6(b) shall be based on the recordkeeping requirements in Condition 1.1.9(b) and applicable standard emission estimate methodology published by USEPA in "Protocol for Equipment Leak Emission Estimates", EPA-453/R-95-017 (November 1995).

If you have any questions on this permit, please contact Jason Schnepf at 217/782-2113.

Donald E. Sutton, P.E.
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cc: Region