

Section I: AQMD BACT Determinations

Application No.: 397357

Equipment Category - Catalyst Regeneration--Fluidized Catalytic Cracking Unit

1. GENERAL INFORMATION		DATE: 9/7/2004
A. MANUFACTURER:		
B. TYPE:	C. MODEL:	
D. STYLE:		
E. APPLICABLE AQMD RULES: 404, 407, 409, 1105, Reg. XX-RECLAIM		
F. COST: \$ (NA)	SOURCE OF COST DATA:	
G. OPERATING SCHEDULE:	24 HRS/DAY	7 DAYS/WK
		52 WKS/YR

2. EQUIPMENT INFORMATION		APP. NO.: 397357
A. FUNCTION: The fluidized catalytic cracking unit (FCCU) converts heavy refinery products to lighter products that can be used as gasoline blendstocks and feedstocks to alkylation and polymerization operations. There is a catalyst regeneration section, in which coked catalyst is regenerated by burning off the carbon. The exit gas from this section passes through an unfired waste heat recovery boiler and then electrostatic precipitators (ESPs).		
B. SIZE/DIMENSION/CAPACITY: 51'8" Diam. x 81'-3" H		
C. BLOWERS:	D. TOTAL FLOW RATE: scfm	
E. MATERIAL STORED/PROCESSED/HANDLED: Coked Catalyst		
F. THROUGHPUT/PROCESS RATE/USAGE RATE:		

3. COMPANY INFORMATION		APP. NO.: 397357
A. NAME: BP West Coast Products	B. SIC CODE: 1794	
C. ADDRESS: 1801 East Sepulveda Blvd.		
CITY: Carson	STATE: CA	ZIP: 90745
D. CONTACT PERSON: Eugene Sekiguchi	E. PHONE NO.: 310-816-8407	

4. PERMIT INFORMATION		APP. NO.: 397357
A. AGENCY: SCAQMD	B. APPLICATION TYPE: modification	
C. AGENCY CONTACT PERSON: Angelita Alfonso	D. PHONE NO.: 909-396-2255	
E. PERMIT TO CONSTRUCT/OPERATE INFORMATION:	P/C NO.: 397357	ISSUANCE DATE: 5/1/2002
<input type="checkbox"/> CHECK IF NO P/C	P/O NO.:	ISSUANCE DATE:
F. START-UP DATE: March 13, 2003		

5. EMISSION INFORMATION

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A. PERMIT

A1. PERMIT LIMIT: Ammonia-10 ppmvd@0%O₂. Emissions from regenerator (PPMV corrected to 0% O₂): NO_x-40 (365-day rolling avg.) and 72 (7-day rolling avg.), SO_x-162 (365-day rolling avg.) and 236 (7-day rolling avg.), CO-500 (24-hr avg. until 12-31-2004, then 1-hr avg.). PM-0.1 grn/scf.

A2. BACT/LAER DETERMINATION: Control of ammonia slip to 10 ppmvd@3%O₂ from SCR unit on FCCU regenerator gas. NO_x, SO_x and CO limits are being negotiated with USEPA (see below, Section 6).

A3. BASIS OF THE BACT DETERMINATION: Control of ammonia slip to 5 ppmvd@3%O₂ had been required on SCR units treating boiler flue gas; however, 10 ppmvd@3%O₂ was allowed in this case due to larger fluctuations in the inlet NO_x level.

B. CONTROL TECHNOLOGY

B1. MANUFACTURER/SUPPLIER: Mitsubishi system/Cormetech catalyst

B2. TYPE: Selective Catalytic Reduction

B3. DESCRIPTION: Flue gas from ESPs passes through catalyst bed. Ammonia is injected into the flue gas upstream of the ESPs to improve PM removal by ESPs, and additional ammonia can be injected immediately upstream of the catalyst bed. Catalyst promotes reaction of ammonia with NO, producing N₂ and H₂O. Overall reactor dimensions are 29'-6" W x 48'-9.5" H x 28'-11.5" L. Ammonia system is aqueous (29.9%) with evaporator and carrier air. Reactor design temperature range is 525-680F.

B4. CONTROL EQUIPMENT PERMIT APPLICATION DATA: P/C NO.: 412719 ISSUANCE DATE: 5/8/2003
P/O NO.: ISSUANCE DATE:

B5. WASTE AIR FLOW TO CONTROL EQUIPMENT: FLOW RATE: 185,000 scfm (design)
ACTUAL CONTAMINANT LOADING: 155 ppmvd@3%O₂ BLOWER HP:

B6. WARRANTY:

B7. PRIMARY POLLUTANTS: NO_x, CO, VOC, PM10

B8. SECONDARY POLLUTANTS: NH₃

B9. SPACE REQUIREMENT:

B10. LIMITATIONS:

B11. UNUSED

B12. OPERATING HISTORY: The unit has been in normal operation since startup with the exception of the early June through early September 2004 during which period the SCR unit was bypassed to permit cleanout of the catalyst bed.

B13. UNUSED

B14. UNUSED

C. CONTROL EQUIPMENT COSTS

C1. CAPITAL COST: CHECK IF INSTALLATION COST IS INCLUDED IN CAPITAL COST

EQUIPMENT: \$ INSTALLATION: \$ (NA) SOURCE OF COST DATA:

C2. ANNUAL OPERATING COST: \$ (NA) SOURCE OF COST DATA:

D. DEMONSTRATION OF COMPLIANCE

D1. STAFF PERFORMING FIELD EVALUATION:

ENGINEER'S NAME:

INSPECTOR'S NAME:

DATE:

5. EMISSION INFORMATION

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D2. COMPLIANCE DEMONSTRATION:

D3. VARIANCE: NO. OF VARIANCES: 1 DATES: March 2003
 CAUSES: During startup with new SCR system in place. To repair leaks caused by SCR back pressure.

D4. VIOLATION: NO. OF VIOLATIONS: None DATES:
 CAUSES:

D5. MAINTENANCE REQUIREMENTS: D6. UNUSED

D7. SOURCE TEST/PERFORMANCE DATA RESULTS AND ANALYSIS:

DATE OF SOURCE TEST: 9/8/03, 12/12/03, 2/6/04, 5/7/04 CAPTURE EFFICIENCY:
 DESTRUCTION EFFICIENCY: OVERALL EFFICIENCY:
 SOURCE TEST/PERFORMANCE DATA:

	9/8/03		SCR Outlet		
	SCR Outlet	SCR Inlet	12/12/03	2/6/04	5/7/04
Stack Temp., F	576				
Flow, dscfm	174,684				
O2 (%)	3.0				
CO2 (%)	16.4				
NOx, ppmvd@0%O2	9.1				
SOx, ppmvd@0%O2	42.8	45.9			
CO, ppmvd@0%O2	32.3				
NH3, ppmvd@3%O2	0.48	22.0	2.0	8.4	3.3
Total PM, grn/dscf	.018				
Solid PM, grn/dscf	.017				

OPERATING CONDITIONS: Normal

TEST METHODS: AQMD Methods 100.1, 5.2, 6.1, 207.1. Method 100.1 was a single-point, one hour test. The stack was checked for stratification and cyclonic flow in July 2003. The test report was approved by AQMD's Monitoring & Source Test Engineering group.

6. COMMENTS

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The original application for the SCR unit was A/N 397358; A/N 412719 was for a modification to allow bypassing of the unit when needed for repairs.

The NO_x, CO and SO_x limits in the permit were based on a legal settlement between BP and USEPA (consent decree civil No. 2:96 CV 095 RL, 8/29/2001). The NO_x and SO_x limits were based on a 12-month test using a deNO_x catalyst and SO_x absorbant in the regenerator. The CO limit was an NSPS (40CFR60, subpart J). These limits are still being negotiated with EPA.

The facility contact stated that NO_x in the SCR inlet flue gas is approximately 40 ppm and that NO_x in the SCR outlet gas normally runs at about 2 ppm. The source test company requested that the facility reduce ammonia injection for the gaseous emissions portion of the test to bring the NO_x into a more measureable range. The NO_x level in the outlet gas is expected to approximately double over the five year estimated life of the catalyst.

The facility finds it difficult to meet the PM limit while also meeting the ammonia slip limit. At times when increased amounts of ammonia are required for ESP performance, they must increase NO_x production in the regenerator (by adding more combustion promoter) to maintain slip below its limit.

The facility has found that the SCR catalyst bed plugs more quickly than had been expected and will probably require annual cleanouts. The pluggage is caused by catalyst fines carrying over from the ESPs.