Section I: AQMD BACT Determinations

Application No.: 427061

Equipment Category - Boiler

1. GENERAL INFORMATION

DATE: 2/1/2006

A. MANUFACTURER: Babcock & Wilcox

B. TYPE: Field Erected

C. MODEL:

D. STYLE:

E. APPLICABLE AQMD RULES: 401, 402, 407, 409, 431.1, 475, Reg. XIII, 1401, Reg. XX (RECLAIM), Reg. XVII

F. COST: $ (NA) SOURCE OF COST DATA:

G. OPERATING SCHEDULE: 6 HRS/DAY 5 DAYS/WK 20 WKS/YR

2. EQUIPMENT INFORMATION

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A. FUNCTION: Produces steam for steam turbine-generator.

B. MAXIMUM HEAT INPUT: 2,088 MMBtu/hr

C. MAXIMUM THROUGHPUT: 225 MW

D. BURNER INFORMATION: NO.: 24 TYPE: Low NOx

E. PRIMARY FUEL: Natural Gas

F. OTHER FUEL: None

G. OPERATING CONDITIONS: Intermittent (merchant power plant)

3. COMPANY INFORMATION

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A. NAME: AES Huntington Beach

B. SIC CODE: 4911

C. ADDRESS: 21730 Newland Street

CITY: Huntington Beach STATE: CA ZIP: 92646

D. CONTACT PERSON: Paul Hurt

E. PHONE NO.: 714-374-1408

4. PERMIT INFORMATION

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A. AGENCY: SCAQMD

B. APPLICATION TYPE: change of conditions

C. AGENCY CONTACT PERSON: Connie Yee

D. PHONE NO.: 909-396-2619

E. PERMIT TO CONSTRUCT/OPERATE INFORMATION: P/C NO.: 427061 ISSUANCE DATE: 7/27/2004

☐ CHECK IF NO P/C P/O NO.: ISSUANCE DATE:

F. START-UP DATE: 1/10/2002

5. EMISSION INFORMATION

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A. PERMIT

A1. PERMIT LIMIT: PPMVD@3%O2: NOx-5, CO-5, NH3-5. Averaging times: NOx measured by source test-1 hr, NOx measured by CEMS-24 hr, CO-1 hr, NH3-1 hr. RECLAIM NOx Major Source. PM limited to .01 gr/scf. SO2 limited to 0.2 lb/MMBtu heat input. Maximum lb/mo. based on fuel use: VOC-1354, PM10-1202. Maximum 374 lb/day CO. CEMS for NOx and CO. Periodic NH3 tests (quarterly first year, semi-annual second year, annual thereafter). Facility must report, quarterly, NOx and CO 1-hr exceedances and NOx 24-hr exceedances.

A2. BACT/LAER DETERMINATION: Above concentration limits for NOx, CO and NH3.

A3. BASIS OF THE BACT/LAER DETERMINATION: NOx and CO limits were offered by applicant and were better than prior BACT. NH3 limit was consistent with Part D of AQMD BACT Guidelines.

B. CONTROL TECHNOLOGY

B1. MANUFACTURER/SUPPLIER: Todd Dynaswirl low-NOx burners with flue gas recirculation (FGR) system. Cormetech selective catalytic reduction (SCR) catalyst. Engelhard oxidation catalyst.

B2. TYPE: Low-NOx burners, FGR, SCR, oxidation catalyst

B3. DESCRIPTION: Burners are controlled mixing type. FGR system is induced FGR, in which flue gas is sucked from the boiler exit into the combustion air fan inlet (no FGR booster fan). Flue gas leaving the steam production section of the boiler passes through the oxidation catalyst and the SCR catalyst prior to entering the economizer and air heater sections of boiler. Ammonia is injected into the flue gas upstream of the SCR catalyst. The SCR catalyst promotes reaction between ammonia (NH3) and NOx to produce N2 and H2O. NH3 is produced by a urea decomposition system. The SCR catalyst design temperature is 730F, and the minimum temperature at which NOx reduction will occur is 525F.

B4. CONTROL EQUIPMENT PERMIT APPLICATION DATA: P/C NO.: 409468 ISSUANCE DATE: 2/4/2003
P/O NO.: ISSUANCE DATE:

B5. WASTE AIR FLOW TO CONTROL EQUIPMENT: FLOW RATE: 380,000 dscfm
ACTUAL CONTAMINANT LOADING: 100 ppmvd NOx and CO (design) BLOWER HP:

B6. WARRANTY: Cormetech: 5 ppmvd@3%O2 NOx and NH3, 10,000 hours catalyst life; Engelhard: 95% CO reduction @ 100 ppm inlet, 3-yr performance guarantee

B7. PRIMARY POLLUTANTS: NOx, CO, VOC, PM, PM10

B8. SECONDARY POLLUTANTS: NH3

B9. SPACE REQUIREMENT: Catalyst volumes (cu. ft): SCR-1554, oxidation-300

B10. LIMITATIONS:

B11. UNUSED

B12. OPERATING HISTORY: Unit was declared to be in commercial operation 1/1/2003. Operates mainly during peak electric demand hours in summer peak season (June-October). Turns down to 90 MW nights and weekends, and shuts off some weekends. NOx compliance not a problem on 24-hr basis. CO has remained very low. NH3 tests have been in 2-4.5 ppm range. No apparent catalyst aging effects (no time-trends in emissions so far).

5. EMISSION INFORMATION

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B13. UNUSED

B14. UNUSED

C. CONTROL EQUIPMENT COSTS

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

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

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

D. DEMONSTRATION OF COMPLIANCE

D1. STAFF PERMFORMING FIELD EVALUATION:

ENGINEER'S NAME: INSPECTOR'S NAME: G. O. Amayo DATE: Numerous inspections Oct-Dec 2003, RECLAIM audits Jan 2002, Dec 2003

D2. COMPLIANCE DEMONSTRATION: Operating in Compliance

D3. VARIANCE: NO. OF VARIANCES: None DATES:

CAUSES:

D4. VIOLATION: NO. OF VIOLATIONS: 2 DATES: 5/17/02, 12/17/03

CAUSES: 5/17/02-CO CEMS certification not started within 90 days after startup (adequate procedure for extreme low NOx and CO not yet established), 12/17/03 exceeded 5 ppm NOx (operator error)

D5. MAINTENANCE REQUIREMENTS:

D6. UNUSED

D7. SOURCE TEST/PERFORMANCE DATA RESULTS AND ANALYSIS:

DATE OF SOURCE TEST: 8/7-15/02, 1/30/03 CAPTURE EFFICIENCY:

DESTRUCTION EFFICIENCY: OVERALL EFFICIENCY:

SOURCE TEST/PERFORMANCE DATA:

Load, MW	225	169	115	90	89	90	215
Date	8/15/02	8/8/02	8/7/02	8/8/02	1/30/03	7/29/04	9/8/05
O2, % (dry)	3.57	3.83	4.54	5.15	NM	5.0	3.7
CO2, % (dry)	10.16	9.89	9.38	8.94	NM		
NOx, ppmvd@3%O2	3.52	4.16	3.84	4.45	NM	4.1	
CO, ppmvd@3%O2	0.0	NM	NM	NM	NM	<2	<5
NH3, ppmvd@3%O2	3.05	1.56	0.47	0.55	0.7	1.9	
VOC, ppmvd@3%O2	4.2	NM	NM	NM	NM		
PM, gr/dscf	.001	.002	NM	.0004	NM		.0005

NM = Not measured

OPERATING CONDITIONS: O2 was 5.72% (dry) in the January 2003 test, based on the CEMS.

TEST METHODS: AQMD Methods 100.1 (1-hr), 5.2, (4-hr) 207.1 (1-hr), 25.3 (50 min.). The 2002 test was approved by AQMD's Monitoring & Source Test Engineering group. Test in 2004 was on identical Unit 4. Test in 2005 was on common stack (Units 3 and 4).

6. COMMENTS

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Huntington Beach Units 3 and 4 are identical steam-electric units whose permits had expired. AES desired to bring these units back into service. AQMD required retrofits of added pollution control equipment consisting of the low-NOx combustion system, SCR system and oxidation catalyst described above.

The facility had no problem meeting the 5 ppm CO limit, but experienced difficulty in meeting the 5 ppm NOx limit on a one-hour basis. They believe that the difficulty in controlling NOx stemmed from the slow response times of the combustion system and the urea decomposition system to corrective changes. They were concerned that this difficulty may increase as the catalyst ages. AQMD therefore allowed an increase from 1-hr to 24-hr averaging of the CEMS NOx reading. Another problem associated with the urea decomposition system is frequent puggage of the ammonia injectors, apparently due to carryover of undecomposed urea.

Due to the low NOx and CO levels being measured, certification of the CEMS was delayed while acceptable procedures were worked out between the applicant and AQMD's Monitoring & Source Test Engineering group. The CEMS is now certified for NOx but not for CO. Present plans are to issue the final permit based on the partially certified CEMS.