LAKELAND ELECTRIC

Farzie Shelton, chE; REM

Environmental Affairs Manager of Licensing & Permitting

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

August 18, 2000

Mr. Hamilton Oven P.E.
Administrator
Siting Coordination Office
Florida Department of Environmental Protection
2600 Blair Stone Rd
MS-48
Tallahassee Fl 32399-2400

Dear Mr. Oven:

Re: C. D. McIntosh, Jr. Power Plant Unit No. 5; PA 74-06SR2
Construction Commencement Notification

In compliance with the above reference Site Certification, and 40 CFR Part 60 § 60.7 we are writing to notify you that on July 27, 2000 we commenced construction for the above referenced unit. We would be forwarding a copy of this communication to Mr. Clair Fancy (Chief of the Bureau of Air Management), and Mr. William C. Thomas (Administrator Division of Air - Southwest District).

If you should have any questions, please do not hesitate to contact me .

Sincerely

Farzie Shelton

cc: Mr. Clair Fancy P.E
Chief of the Bureau of Air Management
Division of Air Resources Management
Florida Department of Environmental Protection
111 S. Magnolia
Suite 4
Tallahassee, Fl 32301

Mr. William C. Thomas P.E.
Administrator
Department of Environmental Protection
3804 Coconut Palm Drive
Tampa Fl 33619

LAKELAND ELECTRIC

Farzie Shelton, chE; REM

Environmental Affairs Manager of Licensing & Permitting

HAND DELIVERD

December 20, 1999

Mr. Clair Fancy P.E
Chief of the Bureau of Air Management
Division of Air Resources Management
Florida Department of Environmental Protection
111 S. Magnolia
Suite 4
Tallahassee, Fl 32301

RE: C.D. McIntosh, Jr. Power Plant, Unit No. 5 Steam Cycle
Site Certification, PA 74-06SR2

Dear Clair:

This correspondence is submitted on behalf of Lakeland Electric regarding the proposed Specific Conditions to the Site Certification for McIntosh Unit 5 Steam Cycle. In addition to the Air Construction Permit and Prevention of Significant Deterioration (PSD) Approval (DEP File 1050004-004-AC; PDS-FL-245), which Lakeland Electric believes is appropriate, two additional specific conditions were also added. These conditions and Lakeland Electric's comments follow:

Additional Specific Condition B. 1. – "If selective catalytic reduction (SCR) technology is installed, the concentration of ammonia in the exhaust gas shall not exceed 5 ppmvd. [Rule 62-212.400 F.A.C.] "

Comment: The requirement for an ammonia slip of 5 ppmvd was not included in the Air Construction Permit and PSD Approval provided for the steam cycle for Unit 5 when the permit was issued in June 1998. Information in the BACT evaluation and the Department's Best Available Control technology (BACT) Analysis was based on an ammonia slip of 10 ppmvd @ 15 percent oxygen that was provided by SCR vendors. Indeed, the Department obtained an independent vendor budgetary cost estimate related to SCR, which was based on 10 ppmvd @ 15 percent oxygen (see attached). At the time Unit 5 was permitted and throughout 1998 and early 1999, the Department suggested limits of 9 ppmvd at 15 percent oxygen (i.e., Duke New Smyrna and KUA Projects). In addition, the establishment of an emission limit for a non-regulated pollutant, such as ammonia, under the authority of the Department's PSD Rules is inappropriate. Given these facts, Lakeland Electric requests that the conditions be modified as follows: **"If selective catalytic reduction (SCR) technology is installed, the SCR system shall be designed with a concentration of ammonia in the exhaust gas no greater than that evaluated in the Air Construction Permit and PSD Approval."**

Additional Specific Condition B. 2. - "If power augmentation is implemented: a. Installation of the oxidation catalyst to control CO (and reduce VOC) will be required; b. Modification of these Conditions of Certification will be required."

Comment: The combustion turbine for the project, the Westinghouse Frame 501G, is unique in the industry in that steam is used to cool critical components in the combustor. For simple cycle operation, the steam used to cool the combustor is discharged through the turbine since there is no mechanism for steam recovery. This steam produces additional power that would otherwise be wasted if not allowed to be discharged through the expansion part of the turbine. The BACT Analysis issued by the Department contemplated both this mode of operation as well as combined cycle mode where steam can be recovered. The BACT emission limits for CO and VOC established by the Department did not vary between simple cycle and combined cycle and were more stringent than the combustion turbine vendor estimated. Also, these BACT limits were similar to that established for another recent project that was also a combined cycle project (i.e., the City of Tallahassee Purdom Repowering Project). Given that the BACT established at the time contemplated both injection of steam during simple cycle operation and combined cycle mode, Lakeland Electric requests that this condition be deleted. The only reason that the injection of steam was included in the Site Certification Application was to address consumptive water use. A conservative estimate of 3,000 hours for power augmentation was assumed to evaluate annual consumptive water use. The water evaluation demonstrated that combined cycle operation would have much lower service water use that simple cycle operation.

Lakeland Electric appreciates this opportunity to provide these comments. Please call if you have any questions.

Sincerely,

Farzie Shelton

Enclosures

cc: Kennard F. Kosky, P.E., Golder Associates
Teresa Heron, DEP-BAR
Steve Palmer, DEP-Siting Coordination
Ronald Tomlin, Lakeland Electric
Doug Roberts, HGSS

ENGELHARD

ENGELHARD CORPORATION
2205 CHEQUERS COURT
BEL AIR, MD 21015
PHONE 410-569-0297
FAX 410-569-1841
E-Mail Fred_Booth@ENGELHARD.COM

April 10, 1998

Florida DEP

ATTN: **Alvaro Linero** via e-mail

RE: **Westinghouse 501G / Simple Cycle**
SCR Catalyst System
Engelhard Budgetary Proposal EPB98154

Dear Mr. Linero,

We enclose Engelhard Budgetary Proposal EPB98154 for Engelhard NOxCAT™ ZNX™ High Temperature SCR Catalyst System.

This Proposal Includes:

- Engelhard **NOxCAT™ ZNX™** High Temperature SCR Catalyst System;
- Catalyst is are sized NOx reduction from 25 ppmvd @ 15%O_2 to 9 ppmvd @ 15%O_2 with ammonia slip of 10 ppmvd @ 15%O_2 for natural gas; performance is estimated during oil firing;reduction at Full Load (Oil);
- Aqueous Ammonia (28% Solution to skid) Delivery System;
- Internally insulated ductwork;
- Guaranteed Performance Data based on the design basis noted;
- Assumed OTSG downstream of gas turbine.
- Dimensions illustrated per enclosed sketches are duct - inside liner dimensions. These dimensions were estimated based on square cross section from OTSG discharge and estimated inlet transitions (2W = 1H) to SCR reactor inlet.

Sincerely yours,

ENGELHARD CORPORATION

Frederick A. Booth
Sales Engineer

cc: Lorraine Pierson - Proposal Administrator

Post-it® Fax Note 7671	Date 4/15	# of pages ▶ 4
To Ken Kosky	From al linero	
Co./Dept. Golder Assoc.	Co. DEP - DARM	
Phone #	Phone #	
Fax #	Fax #	

ENGELHARD

Westinghouse 501G Turbine - Simple Cycle
NOxCAT™ ZNX™ SCR Catalyst System
Engelhard Budgetary Proposal EPB98154
April 10, 1998

ENGELHARD CORPORATION
NOxCAT™ ZNX™ HIGH TEMPERATURE SCR NOx ABATEMENT CATALYST SYSTEM

Engelhard Corporation ("Engelhard") offers to supply the NOxCAT™ ZNX™ High Temperature Ceramic Substrate SCR system herein.

Scope of Supply

1. Engelhard NOxCAT™ ZNX™ SCR catalyst modules;
2. Internal support structures for catalyst modules; includes all hardware and gaskets for catalyst module installation;
3. Internally insulated Ductwork with stainless steel liner to house AIG and SCR catalyst; 940,000
4. Ammonia Injection Grid (AIG);
5. External AIG manifold with flow control valves; Catalyst 2,200,000
6. NH_3 Vaporization / Air dilution skid; 28% Aqueous Ammonia to skid

BUDGET PRICE: Per Unit FOB, shipping point

SCR Catalyst System	**$2,700,000**
Replacement SCR Catalyst	**$1,600,000**

WARRANTY AND GUARANTEE:

Mechanical Warranty: One year of operation* or 18 months after delivery, whichever occurs first.

Performance Guarantee: Three (3) years of operation* or thirty-six (36)) months after catalyst delivery, whichever occurs first. Catalyst warranty is prorated over the guaranteed life.

**Operation is considered to start when exhaust gas is first passed through the catalyst.*

Typical, useful catalyst life is 5 - 7 years.

DOCUMENT / MATERIAL DELIVERY SCHEDULE

Drawings / Documentation - 10 weeks after notice to proceed and receipt of engineering specifications and details

Material Delivery 24 - 30 weeks after approval and release for fabrication

QUALITY ASSURANCE and SAFETY

Engelhard's manufacturing is carried out under strict adherence to published quality control and statistical process control programs, and strict adherence to Corporate safety practices and procedures.

SCR SYSTEM DESIGN BASIS:

Gas Flow from:	Westinghouse 501G Combustion Turbine
Gas Flow:	Assumed Horizontal
Fuel:	Natural Gas and Oil (design for Natural Gas)
Gas Flow Rate (At catalyst face):	See Performance Data
Temperature (At catalyst face):	See Performance Data
CO Concentration (At catalyst face):	See Performance Data
NOx Concentration (At catalyst face):	See Performance Data
NH_3 Slip	10 ppmvd @ 15% O_2
Pressure Drop	Nom. 4.0 "WG

ENGELHARD

Westinghouse 501G Turbine - Simple Cycle
NOxCAT™ ZNX™ SCR Catalyst System
Engelhard Budgetary Proposal EPB98154
April 10, 1998

Performance Data

GIVEN / CALC. DATA			
LOAD	BASE	BASE	BASE
AMBIENT	90	59	30
FUEL	NG	NG	NG
TURBINE EXHAUST FLOW, lb/hr	4,224,240	4,581,360	4,790,880
TURBINE EXHAUST TEMPERATURE, °F	1147	1114	1099
TURBINE EXHAUST GAS ANALYSIS, % VOL. - N_2	69.07	71.36	72.21
O_2	10.66	11.23	11.40
CO_2	4.03	4.06	4.09
H_2O	15.35	12.44	11.38
Ar	0.87	0.90	0.91
GIVEN: TURBINE NOx, ppmvd @ 15%O_2	25	25	25
GIVEN: TURBINE NOx, lb/hr	220	237	249
CALCULATED FLUE GAS MOL. WT.	27.65	27.97	28.09
GAS TEMP. @ SCR CATALYST, °F (+/-20)	1018	1014	994
DESIGN REQUIREMENTS			
NOx OUT, ppmvd@15%O_2	9	9	9
NH_3 SLIP, ppmvd@15%O_2	10	10	10
SCR PRESSURE DROP, Nom. 4.0 "WG - Max.			
GUARANTEED PERFORMANCE DATA			
NOx CONVERSION, % - Min.	64.0%	64.0%	64.0%
Nox OUT, ppmvd@15%O_2 - Max.	9	9	9
NOx OUT, lb/hr - Max.	79.1	85.4	89.5
EXPECTED AQ. NH_3 (28% SOL.) FLOW, lb/hr	287	310	325
NH_3 SLIP, ppmvd@15%O_2 - Max.	10	10	10
SCR PRESSURE DROP, "WG - Max.	3.5	3.5	3.5

GIVEN / CALC. DATA	
LOAD	BASE
AMBIENT	30
FUEL	OIL
TURBINE EXHAUST FLOW, lb/hr	4,901,040
TURBINE EXHAUST TEMPERATURE, °F	1056
TURBINE EXHAUST GAS ANALYSIS, % VOL. - N_2	71.25
O_2	11.30
CO_2	5.51
H_2O	11.03
Ar	0.89
GIVEN: TURBINE NOx, ppmvd @ 15%O_2	42
GIVEN: TURBINE NOx, lb/hr	433
CALCULATED FLUE GAS MOL. WT.	28.35
GAS TEMP. @ SCR CATALYST, °F (+/-20)	959
DESIGN REQUIREMENTS	
NOx OUT, ppmvd@15%O_2	ADVISE
NH_3 SLIP, ppmvd@15%O_2	10
SCR PRESSURE DROP, Nom. 4.0 "WG - Max..	
EXPECTED PERFORMANCE DATA	
NOx CONVERSION, % - Min.	89.0%
NOx OUT, ppmvd@15%O_2 - Max.	13
NOx OUT, lb/hr - Max.	134.3
EXPECTED AQ. NH_3 (28% SOL.) FLOW, lb/hr	506
NH_3 SLIP, ppmvd@15%O_2 - Max.	10
SCR PRESSURE DROP, "WG - Max.	3.5

ENGELHARD

Westinghouse 501G Turbine - Simple Cycle
NOxCAT™ ZNX™ SCR Catalyst System
Engelhard Budgetary Proposal EPB98154
April 10, 1998

Scope of Supply: The equipment supplied is installed by others in accordance with the Engelhard design and installation instructions.

- Engelhard **NOxCAT™ ZNX™** SCR catalyst modules;
- Internal support structures for catalyst modules; includes all hardware and gaskets for catalyst module installation;
- Internally insulated Ductwork with stainless steel liner to house CO catalyst, AIG, and SCR catalyst;
- Ammonia Injection Grid (AIG);
- External AIG manifold with flow control valves;
- NH_3/Air dilution skid: Pre-piped & wired (including all valves and fittings)
  - Two (2) dilution air fans, one for back-up purposes
  - Panel mounted system controls for:
    - Fans (on/off/flow indicators)
    - Air/ammonia flow indicator and controller
    - System pressure indicators
    - Main power disconnect switch

Excluded from Scope of Supply:

Ammonia storage and pumping
Inlet and Outlet transitions including any flow models and flow straighteners
Electrical grounding equipment
Foundations
All other items not specifically listed in Scope of Supply
Interconnecting field piping or wiring
Utilities
All Monitors

Dimensions: Estimated

Reactor Inside Liner Width	(A) 63'-0"
Reactor Inside Liner Height	(B) 37'-0"
Reactor Depth - Total	(C) 12'-0"

Note: Cross section - dimensions can vary due to site