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Black & Veatch Corporation

OUC/KUA/FMPA/Southern Co.
Stanton A Project

B&V Project 98362
B&V File 32.0500
April 25, 2001

Mr. Hamilton S. Oven
Administrator, Siting Coordination Office
Department of Environmental Protection
2800 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Re: Stanton Unit A Combined Cycle Project
Supplemental Site Certification Application
Department File No. PA 81-14SA2
DOAH Case No. 01-0416EPP
OGC Case No. 01-0176
Supplemental Information

Dear Mr. Oven:

On behalf of the Orlando Utilities Commission (OUC), the Kissimmee Utility Authority (KUA), the Florida Municipal Power Agency (FMPA), and the Southern Company-Florida, LLC (Southern-Florida), Black & Veatch submits the following supplemental information in support of the Sufficiency Response filed with the Florida Department of Environmental Protection (Department) on April 23, 2001. Additional copies of this submittal have been provided to all parties controlling public review copies of the Stanton A Supplemental Site Certification Application.

The following information provides resolution of several of the air permit issues as identified in the March 12, 2001, sufficiency letter to Mr. Haddad, OUC. The issues were discussed between Mike Halpin, Department, and Dwain Waters, Southern-Florida, in a telephone conversation on April 18, 2001.

1. Request 1 concerned allotting hours for each off-normal mode of operation. Sufficiency Response 1 stated that operation using duct firing and evaporative cooling were considered normal modes, and off-normal modes (power augmentation and fuel oil firing) would be limited to 1000 hours/year. Final resolution of this issue incorporating the CO emissions limits discussed below will permit unlimited operation under normal, duct firing, and power augmentation modes. Stanton A will be permitted to operate 8760 hours/year firing natural gas, and 1000 hours/year firing fuel oil.

2. Request 2 concerned setting CO emission limits in ppm rather than lbs/hour. Sufficiency Response 1 stated that emission limits set as ppm would be acceptable, and proposed BACT

results. Final resolution of this issue will limit CO emissions to 17 ppm (@ 15% O_2) based on a 24-hour average for normal operation on natural gas, and 14 ppm (@ 15% O_2) for normal operation on fuel oil. These limits do not include startup operations.

3. There are no outstanding issues concerning Requests 3 and 4.

4. Request 5 concerned the use of an oxidation catalyst to control CO emissions. Sufficiency Response 5 stated that installation of an oxidation catalyst was not planned for the project due to costs and low annual emissions levels. Final resolution of this issue will incorporate a provision into the air permit that would require the installation of an oxidation catalyst if necessary to meet the CO emission limits listed in paragraph 2 above. The applicants have also agreed to install a continuous emissions monitoring (CEM) system for CO.

5. Request 6 concerned the level of ammonia slip (5 ppmvd) from the SCR. Sufficiency Response 6 proposed a 10 ppmvd ammonia slip. The applicants have agreed to a 5 ppmvd standard with annual testing to demonstrate compliance. No CEM or reporting other than the annual compliance demonstration will be required for ammonia slip.

6. There are no outstanding issues concerning Request 7.

7. Request 8 concerned the number of hours and emissions during startups. Sufficiency Response 8 stated that these estimates could not be provided, but that the applicants would accept standard language regarding startup limitations. The following estimates have been developed and are provided for final resolution of this issue. The estimated number of cold startups per turbine per year is 24; the estimated number of warm or hot startups per turbine per year is 120. The following estimated emissions are for informational use only and should be noted in the permit as "for informational use only".

Estimated Emissions During Start-up Operations Per Turbine Per Event

	NO_x	SO_2	PM_{10}	VOC	CO
Operational Profile on Natural Gas					
CTG cold start-up (4 hours)(lbs/event)	160	0	48	80	500
CTG warm start-up (2 hours)(lbs/event)	80	0	24	40	250
Operational Profile on Fuel Oil					
CTG cold start-up (4 hours)(lbs/event)	360	400	70	80	500
CTG warm start-up (2 hours)(lbs/event)	180	200	35	40	250

8. There are no outstanding issues concerning Request 9.

9. Request 10 concerned revision of the economic analyses. Sufficiency Response 10 either revised or justified the use of several evaluation factors. Final resolution of this issue has removed the lost power revenue criterion and revised the contingency factor to 3 percent. The revised cost analysis tables are included herein.

We appreciate the Department's cooperation and efforts during the review of the application. Please insert this letter in the Sufficiency Response volume of the Stanton A Supplemental Site Certification Application immediately behind the FDEP tab. If you have any questions concerning the project or this submittal, please do not hesitate to call me at (913) 458-7563 or Fred Haddad of OUC at (407) 236-9698.

Very truly yours,

BLACK & VEATCH CORPORATION

Michael Soltys

J. Michael Soltys
Site Certification Coordinator

JMS:slm
Enclosure[s]

cc: Mr. Frederick Haddad, OUC
Certificate of Service List
M. Halpin
C. Halladay
J. Kozlov, CD
B. Worley, EPA
J. Bunyak, NPS

bcc:

T. Buford, YVV&A
J. Vick, SOFL
L. Curtin, H&K
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B. Sharma, KUA
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R. Casey, FMPA (2)
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OUC/KUA/FMPA/Southern Co.
Stanton A

B&V Project 98362
April 25, 2001

CERTIFICATE OF SERVICE

I Certify that a true and correct copy of this Supplemental Information was mailed to the following on this 26th day of April 2001:

Mike McGovern, SJRWMD	Tom Ballinger, PSC
Brad Hartman, FFWCC	Debra Swim, LEAF
Greg Golgowski, ECFRPC	Clair Fancy, FDEP (4)
Ajit Lalchandani, Orange County	Paul Darst, DCA
James Hollingshead, SJRWMD (3)	George Percy, DHR
Sandra Whitmire, FDOT	Pepe Menedez, DOH
Vivian Garfein, FDEP-Orlando (4)	Anthony Cotter, Orange County
Jim Golden, SFWMD	Teresa Remudo-Fries, Orange County
Marc Ady, SFWMD	Charles Lee, Audubon Society
Dorothy Field, Orlando Public Library	

Michael Soltys

J. Michael Soltys

Table 4-4
Combined NO_X and CO Control Alternative Capital Cost Per GE 7FA CTG/HRSG Unit.

	$SCONO_X$ System	SCR/ Oxidation Catalyst	LNB	Remarks
Direct Capital Cost				Cost based on emissions in Tables 4-1, 4-2, and 4-3 in BACT
SCR & Oxidation Catalyst System	N/A	1,907,000	N/A	Estimated from Engelhard Corporation.
$SCONO_x$ System (Includes catalyst)	19,800,000	N/A	N/A	Estimated from Alstom Power.
Catalyst Reactor Housing	Included	268,000	N/A	Estimated by Alstom Power & scaled from an estimate by Engelhard Corporation.
Control/Instrumentation	Included	180,000	N/A	Estimated; includes controls and monitoring equipment.
Ammonia (Storage & Handling))	N/A	200,000	N/A	Estimated from previous projects.
Purchased Equipment Costs	19,800,000	2,555,000	N/A	
Sales Tax	N/A	N/A	N/A	No sales tax on generating equipment for this project.
Freight	Included	128,000	N/A	5% of Purchased Equipment Costs
Total Purchased Equipment Costs (PEC)	19,800,000	2,683,000	N/A	
Direct Installation Costs				
Balance of Plant	Included	805,000	N/A	For SCR: 8% Foundation & Supports, 14% Handling & Erection, 4% Electrical Installation, 2% Piping, 1% Insulation and 1% Painting. SCONOx bid included installation.
Total Direct Cost Less Catalyst	**19,570,000**	**1,998,000**	Base	Catalyst cost is excluded as annual O&M cost. SCR and oxidation catalyst costs are $826,000 and $664,000, respectively. SCONOx replacement cost estimate is $230,000 per year, based on a 10-year life.
Indirect Capital Costs				
Contingency	594,000	80,000	N/A	For SCR and SCONOx: 3% of Total PEC
Engineering and Supervision	Included	268,000	N/A	For SCR: 10% of Total PEC
Construction & Field Expense	198,000	134,000	N/A	For SCR: 5% of Total PEC; For SCONOx 1% of Total PEC
Construction Fee	297,000	268,000	N/A	For SCR: 10% of Total PEC; For SCONOx 1.5% of Total PEC
Start-up Assistance	Included	54,000	N/A	For SCR: 2% of Total PEC
Performance Test	40,000	27,000	N/A	For SCR: 1% of Total PEC; For SCONOx 0.2% of Total PEC
Total Indirect Capital Costs	1,129,000	831,000	Base	
Total Installed Cost (TIC)	**20,699,000**	**2,829,000**	Base	

Table 4-5 Combined NO_X and CO Control Annualized Cost Per GE 7FA CTG/HRSG Unit				
	$SCONO_X$ System	**SCR/Oxidation Catalyst**	**LNB**	**Remarks**
Direct Annual Cost				Cost based on emissions in Tables 4-1, 4-2, and 4-3 in BACT
Catalyst Replacement	40,000	686,000	N/A	Catalyst life of 3 year for SCR/Oxidation catalyst and 10 year life for SCONOx catalyst.
Operation and Maintenance	310,000	40,000	N/A	Estimated from Alstom Power & includes catalyst washing and materials. For SCR/Oxidation catalyst assumed 2 hr/day, 8,760 hr/yr at $40/hr and includes materials.
Reagent Feed	N/A	87,000	N/A	Assumes 1.4 stoichiometric ratio.
Natural Gas Consumption	218,000	N/A	N/A	Based on 340-lb/hr natural gas consumption.
Power Consumption	4,000	7,000	N/A	Includes injection blower and vaporization of ammonia for SCR and damper actuation for $SCONO_x$.
Annual Distribution Check	N/A	8,000	N/A	Required for SCR, estimated as 0.5% of total direct cost less the catalyst cost.
Total Direct Annual Cost	572,000	828,000	N/A	
Indirect Annual Costs				
Overhead	31,000	24,000	N/A	For SCR 60% of O&M Cost; For SCONOx: 10% of O&M Cost
Administrative Charges	62,000	57,000	N/A	For SCR 2% of Total Installed Cost; For SCONOx: 0.3% of TIC
Property Taxes	103,000	78,000	N/A	For SCR 2.75% of Total Installed Cost; For SCONOx: 0.5% of TIC
Insurance	41,000	28,000	N/A	For SCR 1% of Total Installed Cost; For SCONOx: 0.2% of TIC
Capital Recovery	2,273,000	311,000	N/A	Capital Recovery Factor (0.1098) times the Total Installed Cost
Total Indirect Annual Costs	2,510,000	498,000	N/A	
Total Annualized Cost	**3,082,000**	**1,326,000**	N/A	
Annual Emissions, tpy	144.1	220.1	918.5	Emissions taken from Tables 4-1, 4-2 and 4-3 in BACT
Emissions Reduction, tpy	774.3	698.3	N/A	Emissions calculated from Tables 4-1, 4-2, 4-3 in BACT
Total Cost Effectiveness, $/ton	**4,000**	**1,900**	N/A	Total Annualized Cost / Emissions Reduction
Incremental Annualized Cost	**1,756,000**	N/A	N/A	Total annualized SCR/Oxidation catalyst system cost minus the total annualized SCONOx system cost
Incremental Reduction	**23,000**	N/A	N/A	Total Incremental Annualized Cost / Incremental Emissions Reduction

Table 4-6 NO_x Control Capital Cost Per GE 7FA CTG/HRSG Unit			
Cost Item	**SCR**	**Low NO_x Burners**	**Remarks**
Direct Capital Cost			Cost based on emissions in Tables 4-1, 4-2, and 4-3
SCR Catalysts System	1,161,000	N/A	Estimated from Engelhard Corporation
Catalyst Reactor Housing	268,000	N/A	Scaled from an estimate from Engelhard Corporation
Control/Instrumentation	140,000	N/A	Estimated; includes controls and monitoring equipment.
Ammonia Injection/Dilution Equipment	Included	N/A	Estimated from Engelhard Corporation
Ammonia Storage	200,000	N/A	Estimated from previous projects
Purchased Equipment Costs	1,769,000	N/A	
Freight	88,000	N/A	5% of Purchased Equipment Cost
Total Purchased Equipment Costs	1,857,000	N/A	
Direct Installation Costs			
Balance of Plant	557,000	N/A	For SCR: 8% Foundation & Supports, 14% Handling & Erection, 4% Electrical Installation, 2% Piping, 1% Insulation and 1% Painting
Total Direct Cost Less Catalyst	1,588,000	Base	Cost Catalyst cost is excluded as annual O&M cost. SCR catalyst cost is $826,000.
Indirect Capital Costs			
Contingency	56,000	N/A	3% of Total Purchased Equipment Cost
Engineering and Supervision	186,000	N/A	10% of Total Purchased Equipment Cost
Construction & Field Expense	93,000	N/A	5% of Total Purchased Equipment Cost
Construction Fee	186,000	N/A	10% of Total Purchased Equipment Cost
Start-up Assistance	37,000	N/A	2% of Total Purchased Equipment Cost
Performance Test	19,000	N/A	1% of Total Purchased Equipment Cost
Total Indirect Capital Costs	577,000	Base	
Total Installed Cost	**2,165,000**	Base	

Table 4-7
NO_x Control Annualized Cost Per GE 7FA CTG/HRSG Unit

	SCR	Low NO_x Burners	Remarks
Direct Annual Cost			Cost based on emissions in Tables 4-1, 4-2, and 4-3
Catalyst Replacement	380,000	N/A	Catalyst life of 3 yr. of equivalent operating hours
Operation and Maintenance	36,000	N/A	See text for background information on this item
Reagent Feed	87,000	N/A	Assumes 1.4 stoichiometric ratio
Power Consumption	7,000	N/A	Includes injection blower and vaporization of ammonia for SCR
Annual Distribution Check	8,000	N/A	Required for SCR, estimated as 0.5% of total direct cost less catalyst cost
Total Direct Annual Cost	518,000	N/A	
Indirect Annual Costs			
Overhead	22,000	N/A	60% of O&M Cost
Administrative Charges	43,000	N/A	2% of Total Installed Cost
Property Taxes	60,000	N/A	2.75% of Total Installed Cost
Insurance	22,000	N/A	1% of Total Installed Cost
Capital Recovery	238,000	N/A	Capital Recovery Factor (0.1098) times Total Installed Cost
Total Indirect Annual Costs	385,000	N/A	
Total Annualized Cost	**903,000**	N/A	
Annual Emissions, tpy	145.4	524.1	Emissions taken from Tables 4-1, 4-2, and 4-3
Emissions Reduction, tpy	378.7	N/A	Emissions calculated from Tables 4-1, 4-2, and 4-3
Total Cost Effectiveness, $/ton	**2,400**	N/A	Total Annualized Cost/Emissions Reduction

Table 4-8
CO Reduction System Capital Cost Per GE 7FA CTG/HRSG Unit

	Oxidation Catalyst	Good Combustion Controls	Remarks
Direct Capital Cost			
Oxidation Catalyst System	746,000	NA	Estimated from Engelhard Corporation
Catalyst Reactor Housing	268,000	NA	Scaled from an estimate from Engelhard Corporation based on catalyst size
Control/Instrumentation	40,000	NA	Estimated
Purchased Equipment Costs	1,054,000		
Freight	53,000		5% of Purchased Equipment Cost
Total Purchased Equipment Costs	1,107,000		
Direct Installation Costs			
Balance of Plant	332,000	NA	8% For Foundations & Supports,14% Handling & Erection, 4% Electrical Installation, 2% Piping, 1% Insulation and 1% Painting.
Total Direct Capital Cost Less Catalyst	775,000	Base	Catalyst cost is excluded as annual O&M cost. Oxidation catalyst cost is $664,000.
Indirect Capital Costs			
Contingency	33,000	NA	3% of Total Purchased Equipment Cost
Engineering and Supervision	111,000	NA	10% of Total Purchased Equipment Cost
Construction & Field Expense	55,000	NA	5% of Total Purchased Equipment Cost
Construction Fee	111,000	NA	10% of Total Purchased Equipment Cost
Start-up Assistance	22,000	NA	2% of Total Purchased Equipment Cost
Performance Test	11,000	NA	1% of Total Purchased Equipment Cost
Total Indirect Capital Costs	343,000	Base	
Total Installed Cost	**1,118,000**	Base	

Table 4-9
CO Reduction System Annualized Cost Per GE 7FA CTG/HRSG Unit

	Oxidation Catalyst	Good Combustion Controls	Remarks
Direct Annual Cost			Cost based on emissions in Tables 4-1, 4-2, and 4-3
Catalyst Replacement	306,000	NA	Catalyst life of 3 yr. Of equivalent operating hours
Operation and Maintenance	4,000	NA	See text for background information on this item
Total Direct Annual Cost	310,000	NA	
Indirect Annual Costs Indirect Annual Costs			
Overhead	2,000	NA	60% of Operating and Maintenance Cost
Administrative Charges	22,000	NA	2% of Total Installed Cost
Property Taxes	31,000	NA	2.75% of Total Installed Cost
Insurance	11,000	NA	1% of Total Installed Cost
Capital Recovery	123,000	NA	Capital Recovery Factor (0.1098) times Total Installed Cost
Total Indirect Annual Costs	189,000	NA	
Total Annualized Cost	**499,000**	NA	
Annual Emissions, tpy	74.7	394.4	Emissions taken from Tables 4-1, 4-2, and 4-3
Emissions Reduction, tpy	319.7	NA	Emissions calculated from Tables 4-1, 4-2, and 4-3
Total Cost Effectiveness, $/ton	**1,600**	NA	Total Annualized Cost/Emissions Reduction

Table 6-3
VOC Reduction System Capital Cost Per GE 7FA CTG/HRSG Unit

	Oxidation Catalyst	Good Combustion Controls	Remarks
Direct Capital Cost			
Oxidation Catalyst System	746,000	NA	Estimated from Engelhard Corporation
Catalyst Reactor Housing	268,000	NA	Scaled from an estimate from Engelhard Corporation based on catalyst size
Control/Instrumentation	40,000	NA	Estimated; includes controls and monitoring equipment
Purchased Equipment Costs	1,054,000	NA	
Freight	53,000	NA	5% of Purchased Equipment Cost
Total Purchased Equipment Costs	1,107,000	NA	
Direct Installation Costs			
Balance of Plant	332,000	NA	8% For Foundations & Supports,14% Handling & Erection, 4% Electrical Installation, 2% Piping, 1% Insulation and 1% Painting.
Total Direct Capital Cost Less Catalyst	775,000	Base	Catalyst cost is excluded as annual O&M cost. Oxidation catalyst cost is $664,000.
Indirect Capital Costs			
Contingency	33,000	NA	3% of Total Purchased Equipment Cost
Engineering and Supervision	111,000	NA	10% of Total Purchased Equipment Cost
Construction & Field Expense	55,000	NA	5% of Total Purchased Equipment Cost
Construction Fee	111,000	NA	10% of Total Purchased Equipment Cost
Start-up Assistance	22,000	NA	2% of Total Purchased Equipment Cost
Performance Test	11,000	NA	1% of Total Purchased Equipment Cost
Total Indirect Capital Costs	343,000	Base	
Total Installed Cost	**1,118,000**	Base	

Table 6-4

VOC Reduction System Annualized Cost Per GE 7FA CTG/HRSG Unit

	Oxidation Catalyst	Good Combustion Controls	Remarks
Direct Annual Cost			Cost based on emissions in Tables 6-1 and 6-2
Catalyst Replacement	306,000	NA	Catalyst life of 3 yr. of equivalent operating hours
Operation and Maintenance	4,000	NA	See text for background information on this item
Total Direct Annual Cost	310,000	NA	
Indirect Annual Costs Indirect Annual Costs			
Overhead	2,000	NA	60% of Operating and Maintenance Cost
Administrative Charges	22,000	NA	2% of Total Installed Cost
Property Taxes	31,000	NA	2.75% of Total Installed Cost
Insurance	11,000	NA	1% of Total Installed Cost
Capital Recovery	123,000	NA	Capital Recovery Factor (0.1098) times Total Installed Cost
Total Indirect Annual Costs	189,000	NA	
Total Annualized Cost	**499,000**	NA	
Annual Emissions, tpy	36.9	45.8	Emissions taken from Tables 6-1 and 6-2
Emissions Reduction, tpy	8.9	NA	Emissions calculated from Tables 6-1 and 6-2
Total Cost Effectiveness, $/ton	**56,000**	NA	Total Annualized Cost/Emissions Reduction