

State of Florida



Public Service Commission

CAPITAL CIRCLE OFFICE CENTER • 2540 SHUMARD OAK BOULEVARD
TALLAHASSEE, FLORIDA 32399-0850

-M-E-M-O-R-A-N-D-U-M-

DATE: June 5, 2012
TO: Ann Cole, Commission Clerk, Office of Commission Clerk
FROM: Charles W. Murphy, Senior Attorney, Office of the General Counsel *CM*
RE: Docket No 120103-EI In re: Petition of Progress Energy Florida, Inc. to modify scope of existing environmental program.

Please include Progress Energy Florida, Inc's attached redacted Responses to Staff's First Request for Production of Documents in the docket file. My understanding is that this represents the complete redacted Response and the information needed to link the documents to the Staff's questions.

DOCUMENT NUMBER - DATE

03622 JUN -5 2012

FPSC-COMMISSION CLERK

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition of Progress Energy Florida, Inc.
to modify scope of existing environmental
program.

DOCKET NO. 120103-EI

DATED: MAY 30, 2012

**PROGRESS ENERGY FLORIDA'S RESPONSES TO STAFF'S
FIRST REQUEST FOR PRODUCTION OF DOCUMENTS (NOS. 1-4)**

RESPONSES

1. Referring to Paragraph 8 of the Petition, please provide all work papers and supporting documents associated with each of the two compliance alternatives considered by the Company.

Response: Please see the documents listed below and enclosed with this response.

1.	Estimate of cost for ESP (Est #112 Anclore U1u2 ESP 2014_BB.pdf)	PEF-120103-EI-00001 - PEF-120103-EI-00035
2.	Estimate of cost for Low NOx burners (Short Form Nox Reduction Estimate Spring 2014_LJTU.pdf)	PEF-120103-EI-00036 - PEF-120103-EI-00037
3.	Estimate of capital costs for Natural Gas Conversion (Est # 190 U1 Gas Burner AdditionsRev3.pdf)	PEF-120103-EI-00038 - PEF-120103-EI-00043
4.	Estimate of capital cost & revenue requirements for Natural Gas Conversion (Anclore Gas Conversion Capital Costs_Jan2012.pdf)	PEF-120103-EI-00044 - PEF-120103-EI-00045
5.	January Presentation to Management (Anclore_Conversion_IPP_Rev 0_2011_final MS com.pdf)	PEF-120103-EI-00046 - PEF-120103-EI-00071
6.	March Presentation to Management (Anclore_Conversion_IPP_Rev 1_March 2012_final.pdf)	PEF-120103-EI-00072 - PEF-120103-EI-00093
7.	Production Cost Results for Gas Conversion Case (PEF Anclore Gas Mix IO (Conversion).pdf)	PEF-120103-EI-00094 - PEF-120103-EI-00098
8.	Production Cost Results for No Conversion Case (PEF Anclore Gas Mix IO (No Conversion).pdf)	PEF-120103-EI-00099 - PEF-120103-EI-00103
9.	Analysis of Results and Cost Impact	PEF-120103-EI-00104 - PEF-120103-EI-00111
10.	2009 Engineering Study (Sirois Engineering Report Rev 1.pdf)	PEF-120103-EI-00112 - PEF-120103-EI-00216
11.	Internal Summary and Update of Engineering Study (Anclore Engineering Study Update 09.26.2011.pdf)	PEF-120103-EI-00217 - PEF-120103-EI-00223
12.	2012 Engineering Study (Anclore Phase 1 Report FINAL REVISION 3-20-12.pdf)	PEF-120103-EI-00224 - PEF-120103-EI-00289

DOCUMENT NUMBER-DATE

03622 JUN-5 2012

FPSC-COMMISSION CLERK

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION



In re: Petition of Progress Energy Florida, Inc. to modify scope of existing environmental program. || DOCKET NO. 120103-EI
DATED: MAY 30, 2012

**PROGRESS ENERGY FLORIDA'S RESPONSES TO STAFF'S
FIRST REQUEST FOR PRODUCTION OF DOCUMENTS (NOS. 1-4)**

Pursuant to Rule 28-106.206, Florida Administrative Code, and Rule 1.350, Florida Rules of Civil Procedure, PROGRESS ENERGY FLORIDA, INC. (PEF) hereby responds to Staff's First Request for Production of Documents (Nos. 1-4).

RESPONSES

1. **Referring to Paragraph 8 of the Petition, please provide all work papers and supporting documents associated with each of the two compliance alternatives considered by the Company.**

Response: Please see the documents listed below and enclosed with this response.

1. Estimate of cost for ESP (Est #112 Ancote U1u2 ESP 2014_BB.pdf)
2. Estimate of cost for Low NOx burners (Short Form Nox Reduction Estimate Spring 2014_LJTU.pdf)
3. Estimate of capital costs for Natural Gas Conversion (Est # 190 U1 Gas Burner AdditionsRev3.pdf)
4. Estimate of capital cost & revenue requirements for Natural Gas Conversion (Ancote Gas Conversion Capital Costs_Jan2012.pdf)
5. January Presentation to Management (Ancote_Conversion_IPP_Rev 0_2011_final MS com.pdf)
6. March Presentation to Management (Ancote_Conversion_IPP_Rev 1_March 2012_final.pdf)
7. Production Cost Results for Gas Conversion Case (PEF Ancote Gas Mix IO (Conversion).pdf)
8. Production Cost Results for No Conversion Case (PEF Ancote Gas Mix IO (No Conversion).pdf)
9. Analysis of Results and Cost Impact
10. 2009 Engineering Study (Sirois Engineering Report Rev 1.pdf)
11. Internal Summary and Update of Engineering Study (Ancote Engineering Study Update 09.26.2011.pdf)
12. 2012 Engineering Study (Ancote Phase 1 Report FINAL REVISION 3-20-12.pdf)
13. Updates to 2012 Engineering Study (PE Ancote 2 Final Revised Report 3-25-09.pdf)
14. Appendices to 2012 Engineering Study (all_appendix_sheets Final R1.pdf)
15. Estimate of capital costs for Natural Gas Conversion (Est # 190 U1 Gas Burner AdditionsRev4.pdf)

2. Referring to Paragraph 8 of the Petition, please provide all work papers and supporting documents associated with the fuel cost differential analysis.

Response: Please see items 6, 7, and 8 in response to Request No. 1 above.

3. Referring to Paragraph 9 of the Petition, please provide the "preliminary studies" and analyses performed to identify the components to be upgraded or replaced.

Response: Please see items 10 through 14 in response to Request No. 1 above.

4. Please provide all analyses identified in response to Interrogatory No. 4.

Response: Please refer to PEF's response to Staff's First Set of Interrogatories No. 4. At this time, there are no completed studies or analyses that are responsive to this request.

DATED this 30th day of May, 2012.

HOPPING GREEN & SAMS, P.A.



Gary V. Perko (Fla. Bar No. 855898)
119 S. Monroe Street, Suite 300 (32301)
Post Office Box 6526
Tallahassee, FL 32314
Telephone: 805-425-2359
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Attorneys for PROGRESS ENERGY FLORIDA

Hopping Green & Sams

Attorneys and Counselors

Writer's Direct Dial Number
(850) 425-2359

May 30, 2012

BY HAND DELIVERY

Ann Cole
Director, Office of the Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: Docket No. 120103-EI
Notice of Service of Discovery Responses

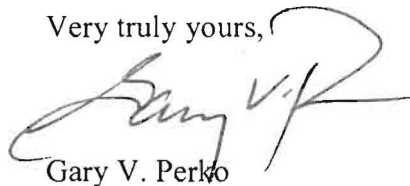
Dear Ms. Cole:

Please take notice that Progress Energy Florida, Inc. has today served its Response to the Staff's First Set of Interrogatories (Nos. 1-8) and Responses to Staff's First Request for Production of Documents (Nos. 1-4).

By copy of this letter, the responses have been furnished to all parties of record.

If you have any questions regarding this notice, please give me a call at 425-2359.

Very truly yours,



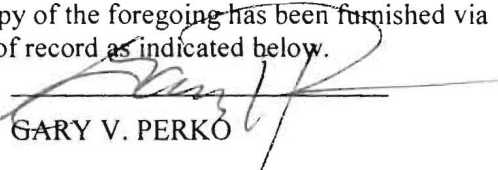
Gary V. Perko

GVP/dg
Enclosures
cc: Certificate of Service



CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished via hand-delivery this 30th day of May, 2012 to all parties of record as indicated below.


GARY V. PERKO

Charles Murphy, Esq. Office of General Counsel Florida Public Service Commission 2540 Shumard Oak Blvd. Tallahassee, FL 32399-0850 cmurphy@psc.state.fl.us	
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Estimate Review Summary Form



Anclote Unit 1 & Unit 2 ESP

Description: Add an electrostatic precipitator to Unit 1 and Unit 2. The estimate assumes one EPS per unit constructed simultaneously.

Estimate Requested by:		Estimate #:	112	Award Date:	1-Jan-13
Estimate Preparation Date:	22-Apr-09	Plant:	Anclote	Cnst Mob Date:	1-Mar-13
Estimated by:	Moody	Type of Contract:	Firm Price	Commercial Op Date:	1-Jul-14

Estimate Purpose	Notes	Escalation
Study		Escalated to CO date: Jul-14
Estimate Basis:	Notes	Estimate Class (AACE):
Technology identified, Site Identified, Prelim engineering not complete.		Class 4- Study Feasibility (L: -15% to -30% / H: +20% to +50%)

Major Assumptions / Clarifications:

**All Dollars are considered to be "Project View" and do not include AFUDC unless clearly identified otherwise.

1. No quotes for equipment have been received.
2. All quantities are approximations.
3. No engineering has been completed.
4. Assumes adequate room for placement of the ESP exists with no demolition required.
5. Includes piling.
6. Excludes Fans.
7. Excludes wind loading allowance.
8. Excludes waste handling and disposal.
9. Excludes air heater modifications.

Estimate Breakdown	Min %	Max %	Min \$'s	Most Likely \$'s	Max \$'s
EPC Contract Costs	-30%	60%	\$ 19,758,838	\$ 28,226,912	\$ 45,163,059
Progress Energy Provided Procurement Costs:	-30%	60%	\$ 25,200,000	\$ 36,000,000	\$ 57,600,000
Progress Energy Labor Costs:	-30%	60%	\$ 1,060,079	\$ 1,514,398	\$ 2,423,037
Progress Energy Indirect Material Costs:	-30%	60%	\$ 1,662,500	\$ 2,375,000	\$ 3,800,000
Progress Energy Contingency:	-30%	60%	\$ 7,268,857	\$ 10,384,082	\$ 16,614,531
Progress Energy Escalation:	-30%	60%	\$ 6,011,377	\$ 8,587,681	\$ 13,740,290
Total (Project View)			\$ 60,961,651	\$ 87,088,073	\$ 139,340,917
Total Fin View Adder - 55% PGN Labor, Sales & Use Tax Excluded			\$ 583,043	\$ 832,919	\$ 1,332,670
Grand Total (Financial View)			\$ 61,544,695	\$ 87,920,992	\$ 140,673,588

Department Review & Approval

Technical:

Name _____ Date _____

Management:

Jeff Moody _____ Date _____

Commercial:

Name _____ Date _____

Leigh Formanek _____ Date _____

Project Manager _____ Date _____

Construction / Procurement / Other:

Name _____ Date _____

Rick Montgomery _____ Date _____

Sue Hardison _____ Date _____

Randy Paulson _____ Date _____

Name _____ Date _____

Tom Cornell / Kevin Murray _____ Date _____

Name _____ Date _____

John Elnitsky _____ Date _____

Anclote Unit 1 & Unit 2 ESP



Description: Add an electrostatic precipitator to Unit 1 and Unit 2. The estimate assumes one EPS per unit constructed simultaneously.

Proposal Number: NA 182
Unit: Firm Price
Type of Contract: Moody
Estimate # : 112
Plant: Anclote
Region: Florida
Type of Estimate: Level 5 (Conceptual Screening)
Estimate Due: 22-Apr-09
Estimate Range: 50% to -30%

PE Proj Kickoff
EPC Award
EPC Mobilize
Demob / CO:
August-2012
January-2013
March-2013
July-2014

Outage 1 Start:
Outage 1 Cmpl:
Outage 2 Start:
Outage 2 Cmpl:

Notes & Assumptions

1. No quotes for equipment have been received
2. All quantities are approximations.
3. No engineering has been completed.
4. Assumes adequate room for placement of the ESP exists with no demolition required.
5. Includes piling
6. Excludes Fans
7. Excludes wind loading allowance
8. Excludes waste handling and disposal
9. Excludes air heater modifications

Total Project Estimate Summary

EPC Contractor			
EPC Contractor Direct & Indirect Cost	\$	19,342,283	22%
EPC Contractor Contingency	\$	1,834,228	2%
EPC Contractor Escalation	\$	3,268,629	4%
EPC Contractor OH&P	\$	3,681,771	4%
TOTAL EPC CONTRACT	\$	28,226,912	32%
Owners Costs			
Progress Energy Direct & Indirect Cost	\$	39,869,396	45%
Progress Energy Contingency	\$	10,364,082	12%
Progress Energy Escalation	\$	8,567,681	10%
TOTAL OWNER COST	\$	58,801,162	67%
Total Project Costs	\$	87,028,073	99%
Total Fin View - 55% PGN Labor, no Sales & Use Tax	\$	87,920,992	100%

Description	Qty's	U / M	\$/UM	Material / Expense \$'s	Avg MH / UM	PF	Total MH's	Labor \$'s	Subcontract \$'s	Total \$'s Cost	% of Project Cost
Division 0 - Demo / Civil / Sitework											
Demolition	-	EA	\$ -	\$ -	-	1.0	-	\$ -	\$ -	\$ -	0.0%
Civil Sitework	-	ACRS	\$ -	\$ -	-	1.0	-	\$ -	\$ -	\$ -	0.0%
Clearing / Grading	-	CY	\$ 18.00	\$ -	0.1	1.0	-	\$ -	\$ -	\$ -	0.0%
Excavation / Backfill	1,000	CY	\$ -	\$ -	0.5	1.0	500	\$ 23,968	\$ -	\$ 23,968	0.0%
Piling	200	EA	\$ 3,200	\$ -	-	1.0	-	\$ -	\$ 640,000	\$ 640,000	0.7%
Site Improvements (Roads/Fence/Landscape, etc.)	1	LS	\$ 250,000	\$ 250,000	-	1.0	-	\$ -	\$ -	\$ 250,000	0.3%
Site Drainage / Ponds / Culverts / Tank Containment	-	ACRS	\$ 32,000	\$ -	-	1.0	-	\$ -	\$ -	\$ -	0.0%
Underground Interferences Allowance	1	EA	\$ -	\$ -	85.0	1.0	-	\$ -	\$ -	\$ -	0.0%
Div 0: Dewatering	-	LS	\$ 500,000	\$ 500,000	500.0	1.0	500	\$ 23,968	\$ -	\$ 23,968	0.0%
Div 0: Testing, Other	-	LS	\$ -	\$ -	-	1.0	-	\$ -	\$ -	\$ -	0.0%
Total: Division 0 - Demo / Civil / Sitework	1,000	CY	FW Excvt	\$ 750,000	1.0	1.0	1,000	\$ 47,936	\$ 640,800	\$ 1,438,736	1.7%
Division 1 - Concrete											
Structural Concrete - 100X50X2 2 EA	740.7	CY	\$ 280	\$ 202,222	2.5	1.0	1,852	\$ 86,770	\$ 11,111	\$ 302,104	0.3%
Grout	100	CF	\$ 50	\$ 5,000	7.00	1.0	700	\$ -	\$ -	\$ 5,000	0.0%
Testing / Other	1	LS	\$ 35	\$ -	-	1.0	-	\$ -	\$ 5,185	\$ 5,185	0.0%
Total: Division 1 - Concrete	741	CY	Concrete	\$ 207,222	3.4	1.0	2,552	\$ 88,770	\$ 16,296	\$ 312,289	0.4%
Division 2 - Structural Steel / Buildings / Arch & Metals											
Structural Steel - Grating / Handrail / Ladders / Other	250	TNS	\$ 3,500	\$ 875,000	25.0	1.0	6,250	\$ 299,800	\$ -	\$ 1,174,600	1.3%
Div 2: Other	2,500	SF	\$ 58	\$ 143,750	0.8	1.0	2,000	\$ 95,872	\$ -	\$ 239,622	0.3%
Total: Division 2 - Structural Steel / Buildings / Arch & Metals	250	TNS	Steel	\$ 1,018,750	33.0	1.0	8,250	\$ 395,672	\$ -	\$ 1,414,222	1.6%
Division 3 - Piping											
Total: Division 3 - Piping	-	LF	Pipe	\$ -	#DN/ft	1.00	-	\$ -	\$ -	\$ -	0.0%
Division 4 - Equipment											
Unit 1	-	LT	\$ -	\$ -	10,514.0	1.0	10,514	\$ 503,999	\$ -	\$ 503,999	0.6%
Precip Shell/Girders/RoofX Bracing-U1	1	LT	\$ -	\$ -	7,420.0	1.0	7,420	\$ 355,985	\$ -	\$ 355,985	0.4%
Precip Nozzles/Perf Plates-U1	1	EA	\$ -	\$ -	1,000.0	1.0	1,000	\$ 47,936	\$ -	\$ 47,936	0.1%
Precip Weather Enclosure-U1	272	EA	\$ -	\$ -	7.2	1.0	1,948	\$ 93,379	\$ -	\$ 93,379	0.1%
Precip Collection-U1	16	EA	\$ -	\$ -	45.0	1.0	720	\$ 34,514	\$ -	\$ 34,514	0.0%
Precip Emitting-U1	8	EA	\$ 100	\$ 800	600.0	1.0	4,800	\$ 230,893	\$ -	\$ 230,893	0.3%
Precip Hopper-U1	178	EA	\$ -	\$ -	11.2	1.0	1,992	\$ 95,469	\$ -	\$ 95,469	0.1%
Precip TRs/Rappers/HV-U1	1	EA	\$ -	\$ -	400.0	1.0	400	\$ 19,174	\$ -	\$ 19,174	0.0%
Precip Alignment-U1	-	EA	\$ 100	\$ -	-	1.0	-	\$ -	\$ -	\$ -	0.0%
Unit 2	-	LT	\$ -	\$ -	10,514.0	1.0	10,514	\$ 503,999	\$ -	\$ 503,999	0.6%
Precip Shell/Girders/RoofX Bracing-U2	1	LT	\$ -	\$ -	7,420.0	1.0	7,420	\$ 355,985	\$ -	\$ 355,985	0.4%
Precip Nozzles/Perf Plates-U2	1	EA	\$ 100	\$ 100	1,000.0	1.0	1,000	\$ 47,936	\$ -	\$ 48,036	0.1%
Precip Weather Enclosure-U2	272	EA	\$ 50	\$ 13,600	7.2	1.0	1,948	\$ 93,379	\$ -	\$ 106,979	0.1%
Precip Collection-U2	16	EA	\$ -	\$ -	45.0	1.0	720	\$ 34,514	\$ -	\$ 34,514	0.0%
Precip Emitting-U2	8	EA	\$ 100	\$ 800	600.0	1.0	4,800	\$ 230,893	\$ -	\$ 230,893	0.3%
Precip Hopper-U2	178	EA	\$ 50	\$ 8,900	11.2	1.0	1,992	\$ 95,469	\$ -	\$ 104,369	0.1%
Precip TRs/Rappers/HV-U2	1	EA	\$ -	\$ -	400.0	1.0	400	\$ 19,174	\$ -	\$ 19,174	0.0%
Precip Alignment-U2	-	EA	\$ -	\$ -	-	1.0	-	\$ -	\$ -	\$ -	0.0%
Other Equipment Packages	-	LS	\$ -	\$ -	-	1.0	-	\$ -	\$ -	\$ -	0.0%
Fine and Safety Equipment	-	LS	\$ -	\$ -	-	1.0	-	\$ -	\$ -	\$ -	0.0%
Construction Testing / Flushing	-	LS	\$ 2,000	\$ -	100.0	1.0	-	\$ -	\$ -	\$ -	0.0%
Total: Division 4 - Equipment	1	LS	\$	\$ 24,300	57,688.9	1.0	57,688	\$ 2,769,638	\$ -	\$ 2,784,838	3.2%
Division 5 - Electrical											
Conduit - AG	2,500	FT	\$ 15.00	\$ 37,500	0.40	1.0	1,050	\$ 50,333	\$ -	\$ 87,833	0.1%
Conduit - BG	-	FT	\$ 6.37	\$ -	0.20	1.0	-	\$ -	\$ -	\$ -	0.0%
Cable Tray	300	FT	\$ 35.00	\$ 12,250	1.55	1.0	543	\$ 26,005	\$ -	\$ 38,255	0.0%
Cable	7,500	LF	\$ 2.97	\$ 22,275	0.04	1.0	300	\$ 14,361	\$ -	\$ 36,656	0.0%
Terminations	15,000	EA	\$ 7.80	\$ 118,500	0.38	1.0	5,625	\$ 269,640	\$ -	\$ 388,140	0.4%
MCC's	2	EA	\$ 16,050	\$ 32,100	50.00	1.0	100	\$ 4,754	\$ -	\$ 36,894	0.0%
Bull Duct / Supports	1,000	FT	\$ 1,500	\$ 1,500,000	9.30	1.0	9,300	\$ 445,825	\$ -	\$ 1,945,825	2.2%
Grounding / Lightning Protection / Cathodic Protection	2,420	FT	\$ 7.50	\$ 18,150	0.30	1.0	726	\$ 34,802	\$ -	\$ 52,952	0.1%
Misc Transformers	2	EA	\$ 250,000	\$ 500,000	125.00	1.0	250	\$ 11,994	\$ -	\$ 511,994	0.6%
DC Equipment/ Batteries/ UPS	1	LS	\$ 435,000	\$ 435,000	150.00	1.0	150	\$ 7,190	\$ -	\$ 442,190	0.5%
Lighting	1	LS	\$ 350,000	\$ 350,000	4,500.00	1.0	4,500	\$ 215,712	\$ -	\$ 565,712	0.6%
Electrical Testing / JB's / Electrical Accessories / Heat Trace / Oth	-	LS	\$ 1,100,000	\$ -	10,000.00	1.0	-	\$ -	\$ -	\$ -	0.0%
Total: Division 5 - Electrical	7,500	LF	Cable	\$ 3,025,775	3.01	1.0	22,644	\$ 1,080,645	\$ -	\$ 4,106,420	4.7%

Description	Qty's	U / M	\$/UM	Material / Expense \$'s	Avg MH / UM	PF	Total MH's	Labor \$'s	Subcontract \$'s	Total \$'s Cost	% of Project Cost
Division 6 - Instrumentation / Controls											
Tubing / Fittings / Supports	1,500	LF	\$ 23.50	\$ 35,250	0.98	1.0	1,440	\$ 89,028	\$ -	\$ 104,278	0.1%
Instruments	60	EA	\$ 800	\$ 48,000	7.0	1.0	420	\$ 20,130	\$ -	\$ 68,130	0.1%
Control System - Upgrade to Existing	1	EA	\$ 800,000	\$ 800,000	800.0	1.0	800	\$ 38,349	\$ -	\$ 838,349	1.0%
Monitoring Systems - I/O's	-	EA	\$ 350,000	\$ -	-	1.0	-	\$ -	\$ -	\$ -	0.0%
Racks / Enclosures / Other	5	EA	\$ 2,200	\$ 11,000	18.0	1.0	90	\$ 4,314	\$ -	\$ 15,314	0.0%
Testing / Flushing	-	EA	\$ 28.60	\$ -	4.8	1.0	-	\$ -	\$ -	\$ -	0.0%
	-	EA	\$ 2,200	\$ -	16.0	1.0	-	\$ -	\$ -	\$ -	0.0%
Total: Division 6 - Instrumentation / Controls	60	EA	Instruments	\$ 894,260	45.83	1.0	2,760	\$ 131,824	\$ -	\$ 1,026,074	1.2%
Division 7 - Insulation / Painting											
Equipment Insulation & Tagging	20,000	SF	\$ 40	\$ -	-	1.0	-	\$ -	\$ 800,000.00	\$ 800,000	0.9%
Painting	20,000	SF	\$ 28.00	\$ -	-	1.0	-	\$ -	\$ 560,000.00	\$ 560,000	0.6%
Total: Division 7 - Insulation / Painting	-	LF		\$ -	-	1.0	-	\$ -	\$ 1,360,000	\$ 1,360,000	1.6%
Total Construction Directs				\$ 5,920,297		1.0	94,683	\$ 4,505,188	\$ 2,017,096	\$ 12,442,579	14.3%
Division 8 - Construction Indirects											
Safety	1	LS	1.30%	\$ 116,368	1.00%	1.0	947	\$ 45,387	\$ -	\$ 161,754	0.2%
Mobilization / Demobilization	1	LS	0.80%	\$ 31,537	0.95%	1.0	899	\$ 43,118	\$ -	\$ 74,655	0.1%
Office / Field Overhead Expenses	1	LS	0.30%	\$ 37,328	0.00%	1.0	-	\$ -	\$ -	\$ 37,328	0.0%
Site Services	1	LS	8.00%	\$ 610,393	3.00%	1.0	2,841	\$ 136,162	\$ -	\$ 746,555	0.9%
Heavy Haul - Assume Barge Unload Close to Plant	-	EA	\$ 400,000.00	\$ -	0.00%	1.0	-	\$ -	\$ -	\$ -	0.0%
Equipment - Other	-	Mths	\$ -	\$ -	0.00%	1.0	-	\$ -	\$ -	\$ -	0.0%
Equipment (\$ per Direct MH)	1	LS	\$ 12.00	\$ 1,136,200	0.45%	1.0	428	\$ 20,424	\$ -	\$ 1,156,625	1.3%
ST&C (\$ per Direct MH)	1	LS	\$ 3.65	\$ 345,994	0.00%	1.0	-	\$ -	\$ -	\$ 345,994	0.4%
Other (freight, rainout/ standby time/ sub ontr OH&P)	1	LS	1.00%	\$ 72,330	1.15%	1.0	1,089	\$ 52,199	\$ 204,000	\$ 328,426	0.4%
Pre-Op Startup & Testing	1	LS	1.00%	\$ 79,038	1.00%	1.0	947	\$ 45,387	\$ -	\$ 124,426	0.1%
General Construction Overhead	-	LS	1.75%	\$ -	0.00%	1.0	-	\$ -	\$ -	\$ -	0.0%
Total: Division 8 - Construction Indirects	1	LS		\$ 2,428,887	7.148	1.0	7,149	\$ 342,878	\$ 204,000	\$ 2,975,362	3.4%
Construction Management											
Staff Construction Management	1	LS	\$ 458,850	\$ 458,850	8.5	1.0	14,567	\$ 1,019,867	\$ -	\$ 1,478,517	1.7%
Craft CM	16	Mths	\$ -	\$ -	216.5	1.0	3,464	\$ 166,050	\$ -	\$ 166,050	0.2%
Total: Construction Management	1	LS		\$ 458,850	223.0	1.0	18,031	\$ 1,185,717	\$ -	\$ 1,644,567	1.9%
Total Construction Cost	1	LS		\$ 8,807,834	7.371	1.0	119,863	\$ 6,033,578	\$ 2,221,096	\$ 17,062,509	19.6%
Division 9 - Home Office Engineering / Indirects											
Engineering / Admin	1	LS		\$ 560,000	20,000.0	1.0	20,090	\$ 1,400,000	\$ -	\$ 1,960,000	2.3%
Insurance / Sureties	1	LS	1.07%	\$ 133,136	1.0	1.0	-	\$ -	\$ -	\$ 133,136	0.2%
Permits / Taxes / Warranty / Other	1	LS	1.50%	\$ 186,639	-	1.0	-	\$ -	\$ -	\$ 186,639	0.2%
Total: Division 9 - Home Office Engineering/Indirects	1	LS		\$ 879,774	20,000.0	1.0	20,090	\$ 1,400,990	\$ -	\$ 2,279,774	2.8%
Total Direct & Indirect Cost (Excluding Cont & Esc)	1	LS		\$ 9,687,609	139,862.6	1.0	139,863	\$ 7,433,578	\$ 2,221,096	\$ 19,342,283	22.2%
Contingency & Escalation											
Contingency	1	LS	10.00%	\$ 968,761	13,986.3	1.0	13,986	\$ 743,358	\$ 222,110	\$ 1,934,228	2.2%
Escalation	1	LS	15.36%	\$ 1,460,791	-	1.0	-	\$ 1,408,432	\$ 379,406	\$ 3,266,629	3.8%
Total Contingency & Escalation				\$ 2,449,552			13,986	\$ 2,151,790	\$ 601,516	\$ 5,202,858	6.0%
Total EPC Cost				\$ 12,137,161			153,849	\$ 9,585,368	\$ 2,822,612	\$ 24,545,141	28.2%
Contractor OH & P											
Contractor G&A	5.0%	PCT		\$ 606,858.04	-	-	-	\$ 479,268.39	\$ 141,130.60	\$ 1,227,257	1.4%
Contractor Fee	10.0%	PCT		\$ 1,213,716.08	-	-	-	\$ 958,536.78	\$ 282,291.21	\$ 2,454,514	2.8%
Total OH & P				\$ 1,820,574				\$ 1,437,805	\$ 423,382	\$ 3,681,771	4.2%
Total EPC Contractor Contract Value										\$ 28,226,912	32.4%
Progress Energy Detail											
Owner Procurements											
U1 Electrostatic Precipitator	1	LS	\$ 18,000,000	\$ 18,000,000	-	-	-	\$ -	\$ -	\$ 18,000,000	20.7%
U2 Electrostatic Precipitator	1	LS	\$ 18,000,000	\$ 18,000,000	-	-	-	\$ -	\$ -	\$ 18,000,000	20.7%
Total Owner Procurements				\$ 36,000,000				\$ -	\$ -	\$ 36,000,000	41.3%
Owner Labor & Indirect Cost											
Staff	1.00	LS	\$ -	\$ 403,496	18,888	-	18,888	\$ 1,110,903	\$ -	\$ 1,514,398	1.7%
Indirect	5.00%	PCT	\$ 36,000,000	\$ 1,800,000	-	-	-	\$ -	\$ -	\$ 1,800,000	2.1%
Owner's Engineering for EPC Contract RFQ through Award	1.00	LS	\$ 500,000	\$ 500,000	-	-	-	\$ -	\$ -	\$ 500,000	0.6%
Insurance - BAR	0.15%	PCT	\$ 50,000,000	\$ 75,000	-	-	-	\$ -	\$ -	\$ 75,000	0.1%
Total Owner Labor & Indirects				\$ 2,778,496			18,888	\$ 1,110,903	\$ -	\$ 3,889,398	4.5%
Owner Contingency & Escalation											
Procurement Contingency	15.0%	PCT	\$ 36,000,000	\$ 5,400,000	-	-	-	\$ -	\$ -	\$ 5,400,000	6.2%
Labor & Indirect Cost Contingency	15.0%	PCT	\$ 3,889,398	\$ 583,410	2,833	-	2,833	\$ 166,635	\$ -	\$ 750,045	0.9%
EPC Contract Contingency	15.0%	PCT	\$ 28,226,912	\$ 4,234,037	-	-	-	\$ -	\$ -	\$ 4,234,037	4.9%
Escalation	9.5%	PCT	\$ 50,273,480	\$ 8,326,993	-	-	-	\$ 258,688	\$ -	\$ 8,585,681	9.9%
Total Contingency & Escalation				\$ 18,546,438			2,833	\$ 425,324	\$ -	\$ 19,971,763	21.8%
Total Owner Cost				\$ 57,324,935			21,721	\$ 1,538,227	\$ -	\$ 58,861,162	67.8%
Total Project Cost				\$ 71,282,670			175,570	\$ 12,559,400	\$ 3,246,004	\$ 87,088,073	100.0%
Construction Indicators											
ST&C \$ / Direct MH:	\$ 3.05	Blended Rate	\$28.72								
Egit \$ / Direct MH:	\$ 12.22	Burden %:	30%								
Direct MH / CM MH's:	8.50	Per Diem (\$ / Wk):	\$580.00								
Direct MH / Indirect MH:	13.25	Retention \$ / MH:	\$1.00								
		Safety \$ / MH:	\$1.00								
Days per Week (Non Out):	5	Total Composite Rate:	\$47.94								
# Shifts (Non Out):	1										
# Shifts (Out):	0	Peak FTE's:	53								
Total Average PF:	1.00	Avg FTE's:	50								
Project Validity Range											
Description				Estimate Range		-30%		100%		80%	
				Min %	Max %	Min \$'s	Most Likely \$'s	Max \$'s	Min \$'s	Max \$'s	
EPC Contract Costs:				-30%	60%	\$ 19,758,838	\$ 28,226,912	\$ 45,163,059			
Progress Energy Provided Procurement Costs:				-30%	60%	\$ 25,200,000	\$ 36,000,000	\$ 57,600,000			
Progress Energy Labor Costs:				-30%	60%	\$ 1,060,079	\$ 1,514,398	\$ 2,423,037			
Progress Energy Indirect Material Costs:				-30%	60%	\$ 1,662,500	\$ 2,375,000	\$ 3,800,000			
Progress Energy Contingency:				-30%	60%	\$ 7,268,857	\$ 10,384,082	\$ 16,614,531			
Progress Energy Escalation:				-30%	60%	\$ 6,011,377	\$ 8,587,681	\$ 13,740,290			
Total						\$ 60,961,651	\$ 87,088,073	\$ 139,340,917			
Total Fin View - 55% PGN Labor, no Sales & Use Tax											
\$ 87,920,992											
Projected Annual Cash Flow											
	2011	2012	2013	2014	2015	2016	2017				
	\$0	\$15,536,822	\$57,067,240	\$14,385,877	\$0	\$0	\$0				\$87,021,939

Anclote Unit 1 & Unit 2 ESP

Escalation Analysis				
	Total \$'s to be Escalated	Total Escalation	% of Total	Code
EPC Contractor				
Engineering / HO Support				
Engineering / HO Support	\$ 1,960,000	\$ 299,400	15%	L
Total Engineering / HO Support Escalation	\$ 1,960,000	\$ 299,400	15%	
Construction				
Construction Equipment / ST&C	\$ 1,481,794	\$ 253,119	17%	M
Construction Materials (Direct Materials)				
-Div 0- Civil / Site work	\$ 750,000	\$ 128,114	17%	M
-Div 1- Concrete (CY Concrete)	\$ 207,222	\$ 35,398	17%	M
-Div 2- Buildings / Structural Steel (Tns Steel)	\$ 1,018,750	\$ 174,022	17%	M
-Div 3- Piping (LF Piping)	\$ -	\$ -	0%	M
-Div 4- Mechanical Equipment	\$ 24,300	\$ 4,151	17%	M
-Div 5- Electrical (LF Cable)	\$ 3,025,775	\$ 516,861	17%	M
-Div 6- Instrumentation / Controls	\$ 894,250	\$ 152,755	17%	M
-Div 7- Insulation / Painting	\$ -	\$ -	0%	M
-CCO- (Contract Change Order)	\$ -	\$ -	0%	M
Subcontract Pricing	\$ 2,221,096	\$ 379,406	17%	S
Construction Mtrl Indirect's (Not counting Construction Equipment)	\$ 946,892	\$ 161,748	17%	M
Project Indirects (Ins/Sureties/Permits/Tax/Warranty)	\$ 319,774	\$ 54,624	17%	M
Craft Perdiem Escalation	\$ 1,179,315	\$ 201,450	17%	L
Craft Labor Rate Escalation	\$ 3,834,597	\$ 655,023	17%	L
Contingency Escalation	\$ 1,934,228	\$ -	0%	C
Escalation Item 1.....		\$ -	0%	
Escalation Item 2.....		\$ -	0%	
Escalation Item 3.....		\$ -	0%	
Total Construction Escalation	\$ 17,837,994	\$ 2,716,670	15%	
Construction Management				
Construction Management (Staff)	\$ 1,478,517	\$ 252,559	17%	L
Total Construction Management Escalation	\$ 1,478,517	\$ 252,559	17%	
Total EPC Escalation	\$ 21,276,511	\$ 3,268,629	15%	
EPC Escalation Breakdown				
Labor	\$ 8,452,428	\$ 1,408,432	17%	L
Materials	\$ 8,668,758	\$ 1,480,791	17%	M

PEF-120103-EI-00004

Anclote Unit 1 & Unit 2 ESP

Escalation Analysis					
	Total \$'s to be Escalated		Total Escalation	% of Total	Code
Subcontracts	\$ 2,221,096	\$	379,406	17%	S
Contingency	\$ 1,934,228	\$	-	0%	C
Total	\$ 21,276,511	\$	3,268,629	15%	

PEF-120103-EI-00005

Anclore Unit 1 & Unit 2 ESP

Escalation Analysis				
	Total \$'s to be Escalated	Total Escalation	% of Total	Code
Progress Energy Escalation				
-PE Provided Procurement				
Unit 1 ESP	\$ 18,000,000	\$ 3,074,748	17%	E
Unit 2 ESP	\$ 18,000,000	\$ 3,074,748	17%	E
			0%	E
	\$ -	\$ -	0%	E
	\$ -	\$ -	0%	E
	\$ -	\$ -	0%	E
	\$ -	\$ -	0%	E
	\$ -	\$ -	0%	E
	\$ -	\$ -	0%	E
Other	\$ -	\$ -	0%	E
Total PE Provided Equipment Escalation	\$ 36,000,000	\$ 6,149,495		
-Progress Energy Labor & Indirect Materials				
Progress Energy Labor	\$ 1,514,398	\$ 258,688	17%	L
Progress Energy Indirect Materials	\$ 2,375,000	\$ 405,696	17%	M
Progress Energy Contingency	\$ 10,384,082	\$ 1,773,802	17%	C
Other	\$ -	\$ -	0%	M
Total: Progress Energy Labor & Indirect Materials	\$ 14,273,480	\$ 2,438,186	17%	
-PE Escalation on EPC Contractor CV				
EPC Contractor CV	\$ -	\$ -	0%	CV
Total Progress Energy Escalation	\$ 50,273,480	\$ 8,587,681	17%	
Progress Energy Escalation Breakdown				
Equipment Procurements	\$ 36,000,000	\$ 6,149,495	17%	E
PE Labor	\$ 1,514,398	\$ 258,688	17%	L
Indirect Materials	\$ 2,375,000	\$ 405,696	17%	M
Subcontracts	\$ -	\$ -	0%	S
Contingency	\$ 10,384,082	\$ 1,773,802	17%	C
Total PE Purchased Equipment Escalation	\$ 50,273,480	\$ 8,587,681	17%	
PE Escalation on EPC Contractor CV				
PE Escalation on EPC Contractor CV	\$ -	\$ -	0%	CV
Total Progress Energy Escalation	\$ 50,273,480	\$ 8,587,681	17%	

PEF-120103-EI-00006

Cash Flow

Estimated		Oct-11	Nov-11	Dec-11	Jan-12	Feb-12
Engineering	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hours		-	-	-	-	-
Rate		\$ -	\$ -	\$ -	\$ -	\$ -
Salary		\$ -	\$ -	\$ -	\$ -	\$ -
Expenses		\$ -	\$ -	\$ -	\$ -	\$ -
Total		\$ -	\$ -	\$ -	\$ -	\$ -
EPC Procurements		-	-	-	-	-
Division 0 Civil/ Sitework	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		\$ -	\$ -	\$ -	\$ -	\$ -
Division 1 Foundations	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		\$ -	\$ -	\$ -	\$ -	\$ -
Division 2 - Structural Steel	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		\$ -	\$ -	\$ -	\$ -	\$ -
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		\$ -	\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		\$ -	\$ -	\$ -	\$ -	\$ -
Division 5 - Electrical	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		\$ -	\$ -	\$ -	\$ -	\$ -
Division 6 - Instruments/ Controls	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		\$ -	\$ -	\$ -	\$ -	\$ -
Division 7 - Insulation/ Painting	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		\$ -	\$ -	\$ -	\$ -	\$ -
EPC Procurements Total		\$ -	\$ -	\$ -	\$ -	\$ -
Craft Manhours						
Division 0 Civil/ Sitework		-	-	-	-	-
Division 1 Foundations		-	-	-	-	-
Division 2 - Structural Steel		-	-	-	-	-
Division 3 - Pipe		-	-	-	-	-
Division 4 - Equipment		-	-	-	-	-
Division 5 - Electrical		-	-	-	-	-
Division 6 - Instruments/ Controls		-	-	-	-	-
Division 7 - Insulation/ Painting		-	-	-	-	-
Division 8 - Construction Indirects		-	-	-	-	-
Total Craft Manhours		-	-	-	-	-
Total Craft labor Cost		\$ -	\$ -	\$ -	\$ -	\$ -
EPC Subcontracts						
Division 0 Civil/ Sitework	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		\$ -	\$ -	\$ -	\$ -	\$ -
Division 1 Foundations	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		\$ -	\$ -	\$ -	\$ -	\$ -

Cash Flow

Estimated		Oct-11	Nov-11	Dec-11	Jan-12	Feb-12
Division 2 - Structural Steel	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$	-	\$	-	\$	-
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$	-	\$	-	\$	-
Division 4 - Equipment	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$	-	\$	-	\$	-
Division 5 - Electrical	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$	-	\$	-	\$	-
Division 6 - Instruments/ Controls	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$	-	\$	-	\$	-
Division 7 - Insulation/ Painting	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$	-	\$	-	\$	-
Total EPC Subcontracts	\$	-	\$	-	\$	-
CM	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hours		-	-	-	-	-
Rate		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Salary	\$	-	\$	-	\$	-
Expenses	\$	-	\$	-	\$	-
Total	\$	-	\$	-	\$	-
Division 8 - Construction Indirects	100.00%	-	-	-	-	-
Safety	\$	-	\$	-	\$	-
Mobilization / Demobilization	\$	-	\$	-	\$	-
Office / Field Overhead Expenses	\$	-	\$	-	\$	-
Site Services	\$	-	\$	-	\$	-
Equipment / ST&C	\$	-	\$	-	\$	-
Other	\$	-	\$	-	\$	-
Pre-Op Startup & Testing	\$	-	\$	-	\$	-
Heavy Haul	\$	-	\$	-	\$	-
Total	\$	-	\$	-	\$	-
Total EPC Direct Cost	\$	-	\$	-	\$	-
Project Indirects						
Contingency	\$	-	\$	-	\$	-
Escalation	\$	-	\$	-	\$	-
Insurance	\$	-				
Warranty						
Total Project Indirects	\$	-	\$	-	\$	-
Total Costs						
Hours		-	-	-	-	-
Rate	\$	-	\$	-	\$	-
Salary	\$	-	\$	-	\$	-
Expenses	\$	-	\$	-	\$	-
Total EPC Project Cost	\$	-	\$	-	\$	-

Cash Flow

Estimated	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12
Invoice Sent to PE	\$ -	\$ -	\$ -	\$ -	\$ -
Invoice Paid by PE	\$ -	\$ -	\$ -	\$ -	\$ -
Cumulative Cash Out	\$ -	\$ -	\$ -	\$ -	\$ -
Unit 1 ESP					
Unit 2 ESP					
Owner Labor & Indirects	\$ -	\$ -	\$ -	\$ -	\$ -
Escalation					
Owner Procurement Escalation	\$ -	\$ -	\$ -	\$ -	\$ -
Owner Indirects Escalation	\$ -	\$ -	\$ -	\$ -	\$ -
Total Escalation	\$ -	\$ -	\$ -	\$ -	\$ -
Contingency					
Owner Procurement Contingency	\$ -	\$ -	\$ -	\$ -	\$ -
Owner Indirects Contingency	\$ -	\$ -	\$ -	\$ -	\$ -
Owner Contingency on EPC Contractor	\$ -	\$ -	\$ -	\$ -	\$ -
Total Contingency	\$ -	\$ -	\$ -	\$ -	\$ -
Total Owner Cash Out	\$ -	\$ -	\$ -	\$ -	\$ -
Total Monthly Cash Out	\$ -	\$ -	\$ -	\$ -	\$ -
Total Cumulative Cash Out	\$ -	\$ -	\$ -	\$ -	\$ -
Total Annual Cash Out	\$ -	\$ -	\$ -	\$ -	\$ -

Cash Flow

PE KO

Estimated

Mar-12

Apr-12

May-12

Jun-12

Jul-12

Aug-12

	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12
Engineering	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hours	-	-	-	-	-	-
Rate	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Salary	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EPC Procurements	-	-	-	-	-	-
Division 0 Civil/ Sitework	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 1 Foundations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 2 - Structural Steel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 5 - Electrical	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 6 - Instruments/ Controls	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 7 - Insulation/ Painting	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EPC Procurements Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Craft Manhours						
Division 0 Civil/ Sitework	-	-	-	-	-	-
Division 1 Foundations	-	-	-	-	-	-
Division 2 - Structural Steel	-	-	-	-	-	-
Division 3 - Pipe	-	-	-	-	-	-
Division 4 - Equipment	-	-	-	-	-	-
Division 5 - Electrical	-	-	-	-	-	-
Division 6 - Instruments/ Controls	-	-	-	-	-	-
Division 7 - Insulation/ Painting	-	-	-	-	-	-
Division 8 - Construction Indirects	-	-	-	-	-	-
Total Craft Manhours	-	-	-	-	-	-
Total Craft labor Cost	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EPC Subcontracts						
Division 0 Civil/ Sitework	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 1 Foundations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Cash Flow

Estimated

PE KO

	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12
Division 2 - Structural Steel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 5 - Electrical	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 6 - Instruments/ Controls	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 7 - Insulation/ Painting	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total EPC Subcontracts	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CM	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hours	-	-	-	-	-	-
Rate	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Salary	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 8 - Construction Indirects	-	-	-	-	-	-
Safety	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Mobilization / Demobilization	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Office / Field Overhead Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Site Services	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Equipment / ST&C	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Pre-Op Startup & Testing	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Heavy Haul	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total EPC Direct Cost	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Project Indirects						
Contingency	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Escalation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Insurance						
Warranty						
Total Project Indirects	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Costs						
Hours	-	-	-	-	-	-
Rate	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Salary	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total EPC Project Cost	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Cash Flow	PE KO					
Estimated	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12
Invoice Sent to PE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Invoice Paid by PE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Cumulative Cash Out	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Unit 1 ESP						
Unit 2 ESP						
Owner Labor & Indirects	\$ -	\$ -	\$ -	\$ -	\$ 116,682	\$ 116,682
Escalation						
Owner Procurement Escalation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Owner Indirects Escalation	\$ -	\$ -	\$ -	\$ -	\$ 73,146	\$ 73,146
Total Escalation	\$ -	\$ -	\$ -	\$ -	\$ 73,146	\$ 73,146
Contingency						
Owner Procurement Contingency	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Owner Indirects Contingency	\$ -	\$ -	\$ -	\$ -	\$ 22,501	\$ 22,501
Owner Contingency on EPC Contract	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Contingency	\$ -	\$ -	\$ -	\$ -	\$ 22,501	\$ 22,501
Total Owner Cash Out	\$ -	\$ -	\$ -	\$ -	\$ 212,329	\$ 212,329
Total Monthly Cash Out	\$ -	\$ -	\$ -	\$ -	\$ 212,329	\$ 212,329
Total Cumulative Cash Out	\$ -	\$ -	\$ -	\$ -	\$ 212,329	\$ 424,658
Total Annual Cash Out						

Cash Flow

EPC AWD

Estimated

Sep-12

Oct-12

Nov-12

Dec-12

Jan-13

	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13
Engineering	0.0%	0.0%	0.0%	0.0%	10.0%
Hours	-	-	-	-	2,000
Rate	\$ -	\$ -	\$ -	\$ -	\$ 70.00
Salary	\$ -	\$ -	\$ -	\$ -	\$ 140,000
Expenses	\$ -	\$ -	\$ -	\$ -	\$ 56,000
Total	\$ -	\$ -	\$ -	\$ -	\$ 196,000
EPC Procurements	-	-	-	-	-
Division 0 Civil/ Sitework	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 1 Foundations	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 2 - Structural Steel	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 5 - Electrical	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 6 - Instruments/ Controls	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 7 - Insulation/ Painting	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
EPC Procurements Total	\$ -	\$ -	\$ -	\$ -	\$ -
Craft Manhours					
Division 0 Civil/ Sitework	-	-	-	-	-
Division 1 Foundations	-	-	-	-	-
Division 2 - Structural Steel	-	-	-	-	-
Division 3 - Pipe	-	-	-	-	-
Division 4 - Equipment	-	-	-	-	-
Division 5 - Electrical	-	-	-	-	-
Division 6 - Instruments/ Controls	-	-	-	-	-
Division 7 - Insulation/ Painting	-	-	-	-	-
Division 8 - Construction Indirects	-	-	-	-	-
Total Craft Manhours	-	-	-	-	-
Total Craft labor Cost	\$ -	\$ -	\$ -	\$ -	\$ -
EPC Subcontracts					
Division 0 Civil/ Sitework	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 1 Foundations	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -

Cash Flow	EPC AWD				
Estimated	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13
Division 2 - Structural Steel	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 5 - Electrical	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 6 - Instruments/ Controls	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 7 - Insulation/ Painting	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total EPC Subcontracts	\$ -	\$ -	\$ -	\$ -	\$ -
CM	0.0%	0.0%	0.0%	0.0%	0.0%
Hours	-	-	-	-	-
Rate	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Salary	\$ -	\$ -	\$ -	\$ -	\$ -
Expenses	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ -	\$ -	\$ -	\$ -	\$ -
Division 8 - Construction Indirects	-	-	-	-	-
Safety	\$ -	\$ -	\$ -	\$ -	\$ -
Mobilization / Demobilization	\$ -	\$ -	\$ -	\$ -	\$ -
Office / Field Overhead Expenses	\$ -	\$ -	\$ -	\$ -	\$ -
Site Services	\$ -	\$ -	\$ -	\$ -	\$ -
Equipment / ST&C	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ -	\$ -	\$ -
Pre-Op Startup & Testing	\$ -	\$ -	\$ -	\$ -	\$ -
Heavy Haul	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ -	\$ -	\$ -	\$ -	\$ -
Total EPC Direct Cost	\$ -	\$ -	\$ -	\$ -	\$ 196,000
Project Indirects					
Contingency	\$ -	\$ -	\$ -	\$ -	\$ 19,929
Escalation	\$ -	\$ -	\$ -	\$ -	\$ 33,679
Insurance					
Warranty					
Total Project Indirects	\$ -	\$ -	\$ -	\$ -	\$ 53,608
Total Costs					
Hours	-	-	-	-	2,000
Rate	\$ -	\$ -	\$ -	\$ -	\$ 70.00
Salary	\$ -	\$ -	\$ -	\$ -	\$ 140,000
Expenses	\$ -	\$ -	\$ -	\$ -	\$ 109,608
Total EPC Project Cost	\$ -	\$ -	\$ -	\$ -	\$ 249,608

Cash Flow	EPC AWD				
Estimated	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13
Invoice Sent to PE	\$ -	\$ -	\$ -	\$ -	\$ 287,049
Invoice Paid by PE	\$ -	\$ -	\$ -	\$ -	\$ -
Cumulative Cash Out	\$ -	\$ -	\$ -	\$ -	\$ -
Unit 1 ESP	\$ 1,800,000	\$ 1,800,000	\$ 1,800,000		
Unit 2 ESP	\$ 1,800,000	\$ 1,800,000	\$ 1,800,000		
Owner Labor & Indirects	\$ 116,682	\$ 116,682	\$ 116,682	\$ 116,682	\$ 116,682
Escalation					
Owner Procurement Escalation	\$ 614,950	\$ 614,950	\$ 614,950	\$ -	\$ -
Owner Indirects Escalation	\$ 73,146	\$ 73,146	\$ 73,146	\$ 73,146	\$ 73,146
Total Escalation	\$ 688,095	\$ 688,095	\$ 688,095	\$ 73,146	\$ 73,146
Contingency					
Owner Procurement Contingency	\$ 540,000	\$ 540,000	\$ 540,000	\$ -	\$ -
Owner Indirects Contingency	\$ 22,501	\$ 22,501	\$ 22,501	\$ 22,501	\$ 22,501
Owner Contingency on EPC Contract	\$ -	\$ -	\$ -	\$ -	\$ 43,057
Total Contingency	\$ 22,501	\$ 22,501	\$ 22,501	\$ 22,501	\$ 65,559
Total Owner Cash Out	\$ 4,967,278	\$ 4,967,278	\$ 4,967,278	\$ 212,329	\$ 255,386
Total Monthly Cash Out	\$ 4,967,278	\$ 4,967,278	\$ 4,967,278	\$ 212,329	\$ 255,386
Total Cumulative Cash Out	\$ 5,391,936	\$ 10,359,215	\$ 15,326,493	\$ 15,538,822	\$ 15,794,208
Total Annual Cash Out				\$ 15,538,822	

Cash Flow	MOB				
Estimated	Feb-13	Mar-13	Apr-13	May-13	Jun-13
Engineering	10.0%	10.0%	10.0%	10.0%	10.0%
Hours	2,000	2,000	2,000	2,000	2,000
Rate	\$ 70.00	\$ 70.00	\$ 70.00	\$ 70.00	\$ 70.00
Salary	\$ 140,000	\$ 140,000	\$ 140,000	\$ 140,000	\$ 140,000
Expenses	\$ 56,000	\$ 56,000	\$ 56,000	\$ 56,000	\$ 56,000
Total	\$ 196,000	\$ 196,000	\$ 196,000	\$ 196,000	\$ 196,000
EPC Procurements	-	-	-	-	-
Division 0 Civil/ Sitework	0.0%	80.0%	20.0%	0.0%	0.0%
	\$ -	\$ 600,000	\$ 150,000	\$ -	\$ -
Division 1 Foundations	0.0%	50.0%	50.0%	0.0%	0.0%
	\$ -	\$ 103,611	\$ 103,611	\$ -	\$ -
Division 2 - Structural Steel	0.0%	0.0%	0.0%	10.0%	10.0%
	\$ -	\$ -	\$ -	\$ 101,875	\$ 101,875
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	0.0%	0.0%	0.0%	5.0%	5.0%
	\$ -	\$ -	\$ -	\$ 1,215	\$ 1,215
Division 5 - Electrical	0.0%	0.0%	0.0%	0.0%	5.0%
	\$ -	\$ 2,420,620	\$ 605,155	\$ -	\$ -
Division 6 - Instruments/ Controls	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ 715,400	\$ 178,850	\$ -	\$ -
Division 7 - Insulation/ Painting	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
EPC Procurements Total	\$ -	\$ 3,839,631	\$ 1,037,616	\$ 103,090	\$ 103,090
Craft Manhours					
Division 0 Civil/ Sitework	-	800	200	-	-
Division 1 Foundations	-	1,276	1,276	-	-
Division 2 - Structural Steel	-	-	-	825	825
Division 3 - Pipe	-	-	-	-	-
Division 4 - Equipment	-	-	-	2,879	2,879
Division 5 - Electrical	-	-	-	-	1,127
Division 6 - Instruments/ Controls	-	-	-	-	-
Division 7 - Insulation/ Painting	-	-	-	-	-
Division 8 - Construction Indirects	-	357	357	357	357
Total Craft Manhours	-	2,433	1,833	4,062	5,189
Total Craft labor Cost	\$ -	\$ 115,844	\$ 87,280	\$ 193,369	\$ 247,030
EPC Subcontracts					
Division 0 Civil/ Sitework	0.0%	80.0%	20.0%	0.0%	0.0%
	\$ -	\$ 512,640	\$ 128,160	\$ -	\$ -
Division 1 Foundations	0.0%	50.0%	50.0%	0.0%	0.0%
	\$ -	\$ 8,148	\$ 8,148	\$ -	\$ -

Cash Flow	MOB				
Estimated	Feb-13	Mar-13	Apr-13	May-13	Jun-13
Division 2 - Structural Steel	0.0%	0.0%	0.0%	10.0%	10.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	0.0%	0.0%	0.0%	5.0%	5.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 5 - Electrical	0.0%	0.0%	0.0%	0.0%	5.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 6 - Instruments/ Controls	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 7 - Insulation/ Painting	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total EPC Subcontracts	\$ -	\$ 520,788.15	\$ 136,308.15	\$ -	\$ -
CM	0.0%	5.0%	5.0%	5.0%	5.0%
Hours	-	902	902	902	902
Rate	#DIV/0!	\$ 65.76	\$ 65.76	\$ 65.76	\$ 65.76
Salary	\$ -	\$ 59,286	\$ 59,286	\$ 59,286	\$ 59,286
Expenses	\$ -	\$ 22,943	\$ 22,943	\$ 22,943	\$ 22,943
Total	\$ -	\$ 82,228	\$ 82,228	\$ 82,228	\$ 82,228
Division 8 - Construction Indirects	-	0	0	0	5%
Safety	\$ -	\$ 2,781	\$ 2,095	\$ 4,642	\$ 5,930
Mobilization / Demobilization	\$ -	\$ 754	\$ 568	\$ 1,258	\$ 1,607
Office / Field Overhead Expenses	\$ -	\$ 892	\$ 672	\$ 1,489	\$ 1,902
Site Services	\$ -	\$ 14,586	\$ 10,989	\$ 24,347	\$ 31,103
Equipment / ST&C	\$ -	\$ 35,409	\$ 26,678	\$ 59,105	\$ 75,507
Other	\$ -	\$ 6,601	\$ 4,973	\$ 11,018	\$ 14,076
Pre-Op Startup & Testing	\$ -	\$ 1,889	\$ 1,423	\$ 3,153	\$ 4,028
Heavy Haul	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ -	\$ 62,910	\$ 47,398	\$ 105,012	\$ 134,153
Total EPC Direct Cost	\$ 196,000	\$ 4,817,401	\$ 1,586,830	\$ 679,699	\$ 762,501
Project Indirects					
Contingency	\$ 19,929	\$ 489,838	\$ 161,351	\$ 69,113	\$ 77,532
Escalation	\$ 33,679	\$ 827,772	\$ 272,664	\$ 116,792	\$ 131,020
Insurance		\$ 112,315			
Warranty					
Total Project Indirects	\$ 53,608	\$ 1,429,925	\$ 434,015	\$ 185,905	\$ 208,552
Total Costs					
Hours	2,000	5,335	4,735	6,963	8,091
Rate	\$ 70.00	\$ 59.07	\$ 60.52	\$ 56.39	\$ 55.17
Salary	\$ 140,000	\$ 315,129	\$ 286,565	\$ 392,655	\$ 446,316
Expenses	\$ 109,608	\$ 5,932,197	\$ 1,734,280	\$ 472,949	\$ 524,737
Total EPC Project Cost	\$ 249,608	\$ 6,247,327	\$ 2,020,845	\$ 865,604	\$ 971,053

Cash Flow	MOB				
Estimated	Feb-13	Mar-13	Apr-13	May-13	Jun-13
Invoice Sent to PE	\$ 287,049	\$ 7,184,426	\$ 2,323,972	\$ 995,445	\$ 1,116,711
Invoice Paid by PE	\$ 287,049	\$ 287,049	\$ 7,184,426	\$ 2,323,972	\$ 995,445
Cumulative Cash Out	\$ 287,049	\$ 574,099	\$ 7,758,524	\$ 10,082,496	\$ 11,077,941
Unit 1 ESP	\$ 1,800,000	\$ 1,800,000	\$ 1,800,000	\$ 1,800,000	\$ 1,800,000
Unit 2 ESP					
Owner Labor & Indirects	\$ 155,576	\$ 155,576	\$ 155,576	\$ 155,576	\$ 155,576
Escalation					
Owner Procurement Escalation	\$ 307,475	\$ 307,475	\$ 307,475	\$ 307,475	\$ 307,475
Owner Indirects Escalation	\$ 97,527	\$ 97,527	\$ 97,527	\$ 97,527	\$ 97,527
Total Escalation	\$ 405,002	\$ 405,002	\$ 405,002	\$ 405,002	\$ 405,002
Contingency					
Owner Procurement Contingency	\$ 270,000	\$ 270,000	\$ 270,000	\$ 270,000	\$ 270,000
Owner Indirects Contingency	\$ 30,002	\$ 30,002	\$ 30,002	\$ 30,002	\$ 30,002
Owner Contingency on EPC Contract	\$ 43,057	\$ 1,077,664	\$ 348,596	\$ 149,317	\$ 167,507
Total Contingency	\$ 73,059	\$ 1,107,666	\$ 378,598	\$ 179,319	\$ 197,509
Total Owner Cash Out	\$ 2,703,637	\$ 3,738,244	\$ 3,009,176	\$ 2,809,897	\$ 2,828,087
Total Monthly Cash Out	\$ 2,990,687	\$ 4,025,293	\$ 10,193,601	\$ 5,133,869	\$ 3,823,532
Total Cumulative Cash Out	\$ 18,784,895	\$ 22,810,188	\$ 33,003,789	\$ 38,137,658	\$ 41,961,190
Total Annual Cash Out					

Cash Flow

Estimated

	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13
Engineering	10.0%	5.0%	5.0%	3.0%	2.0%
Hours	2,000	1,000	1,000	600	400
Rate	\$ 70.00	\$ 70.00	\$ 70.00	\$ 70.00	\$ 70.00
Salary	\$ 140,000	\$ 70,000	\$ 70,000	\$ 42,000	\$ 28,000
Expenses	\$ 56,000	\$ 28,000	\$ 28,000	\$ 16,800	\$ 11,200
Total	\$ 196,000	\$ 98,000	\$ 98,000	\$ 58,800	\$ 39,200
EPC Procurements	-	-	-	-	-
Division 0 Civil/ Sitework	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 1 Foundations	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 2 - Structural Steel	10.0%	10.0%	10.0%	10.0%	10.0%
	\$ 101,875	\$ 101,875	\$ 101,875	\$ 101,875	\$ 101,875
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	7.0%	7.0%	10.0%	10.0%	10.0%
	\$ 1,701	\$ 1,701	\$ 2,430	\$ 2,430	\$ 2,430
Division 5 - Electrical	10.0%	10.0%	10.0%	10.0%	10.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 6 - Instruments/ Controls	0.0%	20.0%	20.0%	20.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 7 - Insulation/ Painting	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
EPC Procurements Total	\$ 103,576	\$ 103,576	\$ 104,305	\$ 104,305	\$ 104,305
Craft Manhours					
Division 0 Civil/ Sitework	-	-	-	-	-
Division 1 Foundations	-	-	-	-	-
Division 2 - Structural Steel	825	825	825	825	825
Division 3 - Pipe	-	-	-	-	-
Division 4 - Equipment	4,031	4,031	5,759	5,759	5,759
Division 5 - Electrical	2,254	2,254	2,254	2,254	2,254
Division 6 - Instruments/ Controls	-	550	550	550	-
Division 7 - Insulation/ Painting	-	-	-	-	-
Division 8 - Construction Indirects	357	357	572	572	572
Total Craft Manhours	7,468	8,018	9,960	9,960	9,410
Total Craft labor Cost	\$ 355,522	\$ 381,706	\$ 474,162	\$ 474,162	\$ 447,979
EPC Subcontracts					
Division 0 Civil/ Sitework	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 1 Foundations	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -

Cash Flow

Estimated	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13
Division 2 - Structural Steel	10.0%	10.0%	10.0%	10.0%	10.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	7.0%	7.0%	10.0%	10.0%	10.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 5 - Electrical	10.0%	10.0%	10.0%	10.0%	10.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 6 - Instruments/ Controls	0.0%	20.0%	20.0%	20.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 7 - Insulation/ Painting	0.0%	0.0%	0.0%	0.0%	25.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ 340,000
Total EPC Subcontracts	\$ -	\$ -	\$ -	\$ -	\$ 340,000.00
CM	5.0%	5.0%	10.0%	5.0%	5.0%
Hours	902	902	1,803	902	902
Rate	\$ 65.76	\$ 65.76	\$ 65.76	\$ 65.76	\$ 65.76
Salary	\$ 59,286	\$ 59,286	\$ 118,572	\$ 59,286	\$ 59,286
Expenses	\$ 22,943	\$ 22,943	\$ 45,885	\$ 22,943	\$ 22,943
Total	\$ 82,228	\$ 82,228	\$ 164,457	\$ 82,228	\$ 82,228
Division 8 - Construction Indirects	7%	8%	10%	10%	0
Safety	\$ 8,534	\$ 9,162	\$ 11,382	\$ 11,382	\$ 10,753
Mobilization / Demobilization	\$ 2,313	\$ 2,483	\$ 3,085	\$ 3,085	\$ 2,914
Office / Field Overhead Expenses	\$ 2,737	\$ 2,939	\$ 3,651	\$ 3,651	\$ 3,449
Site Services	\$ 44,764	\$ 48,060	\$ 59,702	\$ 59,702	\$ 56,405
Equipment / ST&C	\$ 108,669	\$ 116,672	\$ 144,932	\$ 144,932	\$ 136,929
Other	\$ 20,258	\$ 21,750	\$ 27,018	\$ 27,018	\$ 25,526
Pre-Op Startup & Testing	\$ 5,796	\$ 6,223	\$ 7,731	\$ 7,731	\$ 7,304
Heavy Haul	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ 193,071	\$ 207,290	\$ 257,499	\$ 257,499	\$ 243,280
Total EPC Direct Cost	\$ 930,397	\$ 872,800	\$ 1,098,423	\$ 976,995	\$ 1,256,992
Project Indirects					
Contingency	\$ 94,604	\$ 88,747	\$ 111,689	\$ 99,342	\$ 127,812
Escalation	\$ 159,870	\$ 149,973	\$ 188,742	\$ 167,877	\$ 215,988
Insurance		\$ -			
Warranty					
Total Project Indirects	\$ 254,474	\$ 238,720	\$ 300,430	\$ 267,219	\$ 343,801
Total Costs					
Hours	10,369	9,919	12,763	11,462	10,712
Rate	\$ 53.50	\$ 51.51	\$ 51.93	\$ 50.21	\$ 49.97
Salary	\$ 554,808	\$ 510,992	\$ 662,734	\$ 575,448	\$ 535,265
Expenses	\$ 630,063	\$ 600,528	\$ 736,120	\$ 668,765	\$ 1,065,528
Total EPC Project Cost	\$ 1,184,871	\$ 1,111,520	\$ 1,398,854	\$ 1,244,214	\$ 1,600,793

Cash Flow

Estimated

	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13
Invoice Sent to PE	\$ 1,362,601	\$ 1,278,248	\$ 1,608,682	\$ 1,430,846	\$ 1,840,912
Invoice Paid by PE	\$ 1,116,711	\$ 1,362,601	\$ 1,278,248	\$ 1,608,682	\$ 1,430,846
Cumulative Cash Out	\$ 12,194,653	\$ 13,557,254	\$ 14,835,502	\$ 16,444,184	\$ 17,875,030
Unit 1 ESP	\$ 1,800,000	\$ 1,800,000			
Unit 2 ESP	\$ 1,800,000	\$ 1,800,000	\$ 1,800,000	\$ 1,800,000	\$ 1,800,000
Owner Labor & Indirects	\$ 155,576	\$ 155,576	\$ 155,576	\$ 155,576	\$ 155,576
Escalation					
Owner Procurement Escalation	\$ 614,950	\$ 614,950	\$ 307,475	\$ 307,475	\$ 307,475
Owner Indirects Escalation	\$ 97,527	\$ 97,527	\$ 97,527	\$ 97,527	\$ 97,527
Total Escalation	\$ 712,477	\$ 712,477	\$ 405,002	\$ 405,002	\$ 405,002
Contingency					
Owner Procurement Contingency	\$ 540,000	\$ 540,000	\$ 270,000	\$ 270,000	\$ 270,000
Owner Indirects Contingency	\$ 30,002	\$ 30,002	\$ 30,002	\$ 30,002	\$ 30,002
Owner Contingency on EPC Contract	\$ 204,390	\$ 191,737	\$ 241,302	\$ 214,627	\$ 276,137
Total Contingency	\$ 234,392	\$ 221,739	\$ 271,304	\$ 244,629	\$ 306,139
Total Owner Cash Out	\$ 5,242,445	\$ 5,229,792	\$ 2,901,882	\$ 2,875,207	\$ 2,936,717
Total Monthly Cash Out	\$ 6,359,156	\$ 6,592,393	\$ 4,180,130	\$ 4,483,889	\$ 4,367,562
Total Cumulative Cash Out	\$ 48,320,346	\$ 54,912,739	\$ 59,092,870	\$ 63,576,759	\$ 67,944,321
Total Annual Cash Out					

Cash Flow

Estimated

Dec-13

Jan-14

Feb-14

Mar-14

Apr-14

	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14
Engineering	2.0%	2.0%	2.0%	2.0%	2.0%
Hours	400	400	400	400	400
Rate	\$ 70.00	\$ 70.00	\$ 70.00	\$ 70.00	\$ 70.00
Salary	\$ 28,000	\$ 28,000	\$ 28,000	\$ 28,000	\$ 28,000
Expenses	\$ 11,200	\$ 11,200	\$ 11,200	\$ 11,200	\$ 11,200
Total	\$ 39,200	\$ 39,200	\$ 39,200	\$ 39,200	\$ 39,200
EPC Procurements	-	-	-	-	-
Division 0 Civil/ Sitework	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 1 Foundations	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 2 - Structural Steel	0.0%	0.0%	0.0%	10.0%	10.0%
	\$ -	\$ -	\$ -	\$ 101,875	\$ 101,875
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	5.0%	5.0%	5.0%	10.0%	10.0%
	\$ 1,215	\$ 1,215	\$ 1,215	\$ 2,430	\$ 2,430
Division 5 - Electrical	10.0%	10.0%	10.0%	10.0%	5.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 6 - Instruments/ Controls	0.0%	0.0%	0.0%	20.0%	20.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 7 - Insulation/ Painting	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
EPC Procurements Total	\$ 1,215	\$ 1,215	\$ 1,215	\$ 104,305	\$ 104,305
Craft Manhours					
Division 0 Civil/ Sitework	-	-	-	-	-
Division 1 Foundations	-	-	-	-	-
Division 2 - Structural Steel	-	-	-	825	825
Division 3 - Pipe	-	-	-	-	-
Division 4 - Equipment	2,879	2,879	2,879	5,759	5,759
Division 5 - Electrical	2,254	2,254	2,254	2,254	1,127
Division 6 - Instruments/ Controls	-	-	-	550	550
Division 7 - Insulation/ Painting	-	-	-	-	-
Division 8 - Construction Indirects	357	357	357	572	572
Total Craft Manhours	5,491	5,491	5,491	9,960	8,833
Total Craft labor Cost	\$ 261,416	\$ 261,416	\$ 261,416	\$ 474,162	\$ 420,502
EPC Subcontracts					
Division 0 Civil/ Sitework	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 1 Foundations	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -

Cash Flow

Estimated	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14
Division 2 - Structural Steel	0.0%	0.0%	0.0%	10.0%	10.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	5.0%	5.0%	5.0%	10.0%	10.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 5 - Electrical	10.0%	10.0%	10.0%	10.0%	5.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 6 - Instruments/ Controls	0.0%	0.0%	0.0%	20.0%	20.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 7 - Insulation/ Painting	25.0%	0.0%	0.0%	0.0%	0.0%
\$ 340,000	\$ -	\$ -	\$ -	\$ -	\$ -
Total EPC Subcontracts	\$ 340,000.00	\$ -	\$ -	\$ -	\$ -
CM	5.0%	5.0%	5.0%	5.0%	10.0%
Hours	902	902	902	902	1,803
Rate	\$ 65.76	\$ 65.76	\$ 65.76	\$ 65.76	\$ 65.76
Salary	\$ 59,286	\$ 59,286	\$ 59,286	\$ 59,286	\$ 118,572
Expenses	\$ 22,943	\$ 22,943	\$ 22,943	\$ 22,943	\$ 45,885
Total	\$ 82,228	\$ 82,228	\$ 82,228	\$ 82,228	\$ 164,457
Division 8 - Construction Indirects	0	0	0	0	0
Safety	\$ 6,275	\$ 6,275	\$ 6,275	\$ 11,382	\$ 10,094
Mobilization / Demobilization	\$ 1,701	\$ 1,701	\$ 1,701	\$ 3,085	\$ 2,736
Office / Field Overhead Expenses	\$ 2,013	\$ 2,013	\$ 2,013	\$ 3,651	\$ 3,238
Site Services	\$ 32,915	\$ 32,915	\$ 32,915	\$ 59,702	\$ 52,945
Equipment / ST&C	\$ 79,904	\$ 79,904	\$ 79,904	\$ 144,932	\$ 128,530
Other	\$ 14,895	\$ 14,895	\$ 14,895	\$ 27,018	\$ 23,960
Pre-Op Startup & Testing	\$ 4,262	\$ 4,262	\$ 4,262	\$ 7,731	\$ 6,856
Heavy Haul	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ 141,965	\$ 141,965	\$ 141,965	\$ 257,499	\$ 228,358
Total EPC Direct Cost	\$ 866,024	\$ 526,024	\$ 526,024	\$ 957,395	\$ 956,821
Project Indirects					
Contingency	\$ 88,058	\$ 53,487	\$ 53,487	\$ 97,349	\$ 97,291
Escalation	\$ 148,809	\$ 90,386	\$ 90,386	\$ 164,509	\$ 164,410
Insurance					
Warranty					
Total Project Indirects	\$ 236,867	\$ 143,873	\$ 143,873	\$ 261,858	\$ 261,701
Total Costs					
Hours	6,793	6,793	6,793	11,262	11,036
Rate	\$ 51.33	\$ 51.33	\$ 51.33	\$ 49.86	\$ 51.38
Salary	\$ 348,702	\$ 348,702	\$ 348,702	\$ 561,448	\$ 567,073
Expenses	\$ 754,189	\$ 321,195	\$ 321,195	\$ 657,805	\$ 651,449
Total EPC Project Cost	\$ 1,102,891	\$ 669,897	\$ 669,897	\$ 1,219,253	\$ 1,218,522

Cash Flow

Estimated	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14
Invoice Sent to PE	\$ 1,268,324	\$ 770,382	\$ 770,382	\$ 1,402,141	\$ 1,401,301
Invoice Paid by PE	\$ 1,840,912	\$ 1,268,324	\$ 770,382	\$ 770,382	\$ 1,402,141
Cumulative Cash Out	\$ 19,715,942	\$ 20,984,266	\$ 21,754,648	\$ 22,525,029	\$ 23,927,170
Unit 1 ESP					
Unit 2 ESP	\$ 1,800,000	\$ 1,800,000			
Owner Labor & Indirects	\$ 155,576	\$ 155,576	\$ 155,576	\$ 155,576	\$ 155,576
Escalation					
Owner Procurement Escalation	\$ 307,475	\$ 307,475	\$ -	\$ -	\$ -
Owner Indirects Escalation	\$ 97,527	\$ 97,527	\$ 97,527	\$ 97,527	\$ 97,527
Total Escalation	\$ 405,002	\$ 405,002	\$ 97,527	\$ 97,527	\$ 97,527
Contingency					
Owner Procurement Contingency	\$ 270,000	\$ 270,000	\$ -	\$ -	\$ -
Owner Indirects Contingency	\$ 30,002	\$ 30,002	\$ 30,002	\$ 30,002	\$ 30,002
Owner Contingency on EPC Contract	\$ 190,249	\$ 115,557	\$ 115,557	\$ 210,321	\$ 210,195
Total Contingency	\$ 220,250	\$ 145,559	\$ 145,559	\$ 240,323	\$ 240,197
Total Owner Cash Out	\$ 2,850,829	\$ 2,776,137	\$ 398,662	\$ 493,426	\$ 493,300
Total Monthly Cash Out	\$ 4,691,740	\$ 4,044,462	\$ 1,169,044	\$ 1,263,808	\$ 1,895,441
Total Cumulative Cash Out	\$ 72,636,061	\$ 76,680,523	\$ 77,849,567	\$ 79,113,375	\$ 81,008,816
Total Annual Cash Out	\$ 57,097,240				

Cash Flow

DEMOB

Estimated

May-14

Jun-14

Jul-14

Aug-14

Sep-14

	May-14	Jun-14	Jul-14	Aug-14	Sep-14
Engineering	2.0%	2.0%	1.0%	0.0%	0.0%
Hours	400	400	200	-	-
Rate	\$ 70.00	\$ 70.00	\$ 70.00	\$ -	\$ -
Salary	\$ 28,000	\$ 28,000	\$ 14,000	\$ -	\$ -
Expenses	\$ 11,200	\$ 11,200	\$ 5,600	\$ -	\$ -
Total	\$ 39,200	\$ 39,200	\$ 19,600	\$ -	\$ -
EPC Procurements	-	-	-	-	-
Division 0 Civil/ Sitework	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 1 Foundations	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 2 - Structural Steel	10.0%	0.0%	0.0%	0.0%	0.0%
	\$ 101,875	\$ -	\$ -	\$ -	\$ -
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	10.0%	1.0%	0.0%	0.0%	0.0%
	\$ 2,430	\$ 243	\$ -	\$ -	\$ -
Division 5 - Electrical	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 6 - Instruments/ Controls	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 7 - Insulation/ Painting	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
EPC Procurements Total	\$ 104,305	\$ 243	\$ -	\$ -	\$ -
Craft Manhours					
Division 0 Civil/ Sitework	-	-	-	-	-
Division 1 Foundations	-	-	-	-	-
Division 2 - Structural Steel	825	-	-	-	-
Division 3 - Pipe	-	-	-	-	-
Division 4 - Equipment	5,759	576	-	-	-
Division 5 - Electrical	-	-	-	-	-
Division 6 - Instruments/ Controls	-	-	-	-	-
Division 7 - Insulation/ Painting	-	-	-	-	-
Division 8 - Construction Indirects	357	357	357	-	-
Total Craft Manhours	6,941	933	357	-	-
Total Craft labor Cost	\$ 330,448	\$ 44,432	\$ 17,016	\$ -	\$ -
EPC Subcontracts					
Division 0 Civil/ Sitework	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -
Division 1 Foundations	0.0%	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -	\$ -

Cash Flow

DEMOB

Estimated

May-14

Jun-14

Jul-14

Aug-14

Sep-14

Division 2 - Structural Steel	10.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	10.0%	1.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 5 - Electrical	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 6 - Instruments/ Controls	0.0%	0.0%	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Division 7 - Insulation/ Painting	0.0%	25.0%	25.0%	0.0%	0.0%
\$ -	\$ 340,000	\$ 340,000	\$ -	\$ -	\$ -
Total EPC Subcontracts	\$ -	\$ 340,000.00	\$ 340,000.00	\$ -	\$ -
CM	10.0%	5.0%	5.0%	0.0%	0.0%
Hours	1,803	902	902	-	-
Rate	\$ 65.76	\$ 65.76	\$ 65.76	#DIV/0!	#DIV/0!
Salary	\$ 118,572	\$ 59,286	\$ 59,286	\$ -	\$ -
Expenses	\$ 45,885	\$ 22,943	\$ 22,943	\$ -	\$ -
Total	\$ 164,457	\$ 82,228	\$ 82,228	\$ -	\$ -
Division 8 - Construction Indirects	0	0	0	-	-
Safety	\$ 7,932	\$ 1,067	\$ 408	\$ -	\$ -
Mobilization / Demobilization	\$ 2,150	\$ 289	\$ 111	\$ -	\$ -
Office / Field Overhead Expenses	\$ 2,544	\$ 342	\$ 131	\$ -	\$ -
Site Services	\$ 41,607	\$ 5,594	\$ 2,142	\$ -	\$ -
Equipment / ST&C	\$ 101,004	\$ 13,581	\$ 5,201	\$ -	\$ -
Other	\$ 18,829	\$ 2,532	\$ 970	\$ -	\$ -
Pre-Op Startup & Testing	\$ 5,388	\$ 724	\$ 277	\$ -	\$ -
Heavy Haul	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ 179,453	\$ 24,129	\$ 9,241	\$ -	\$ -
Total EPC Direct Cost	\$ 817,863	\$ 530,232	\$ 468,085	\$ -	\$ -
Project Indirects					
Contingency	\$ 83,161	\$ 53,915	\$ 47,595	\$ -	\$ -
Escalation	\$ 140,533	\$ 91,110	\$ 80,431	\$ -	\$ -
Insurance					
Warranty			\$ 157,452		
Total Project Indirects	\$ 223,694	\$ 145,024	\$ 285,478	\$ -	\$ -
Total Costs					
Hours	9,144	2,235	1,459	-	-
Rate	\$ 52.17	\$ 58.94	\$ 61.89	\$ -	\$ -
Salary	\$ 477,019	\$ 131,717	\$ 90,302	\$ -	\$ -
Expenses	\$ 564,537	\$ 543,539	\$ 663,261	\$ -	\$ -
Total EPC Project Cost	\$ 1,041,557	\$ 675,256	\$ 753,563	\$ -	\$ -

Cash Flow

DEMOB

Estimated	May-14	Jun-14	Jul-14	Aug-14	Sep-14
Invoice Sent to PE	\$ 1,197,790	\$ 776,545	\$ 866,598	\$ -	\$ -
Invoice Paid by PE	\$ 1,401,301	\$ 1,197,790	\$ 776,545	\$ 866,598	\$ -
Cumulative Cash Out	\$ 25,328,471	\$ 26,526,261	\$ 27,302,806	\$ 28,169,403	\$ 28,169,403
Unit 1 ESP					
Unit 2 ESP					
Owner Labor & Indirects	\$ 155,576	\$ 155,576	\$ 155,576	\$ 116,682	\$ 77,788
Escalation					
Owner Procurement Escalation	\$ -	\$ -	\$ -	\$ -	\$ -
Owner Indirects Escalation	\$ 97,527	\$ 97,527	\$ 97,527	\$ 73,146	\$ 48,764
Total Escalation	\$ 97,527	\$ 97,527	\$ 97,527	\$ 73,146	\$ 48,764
Contingency					
Owner Procurement Contingency	\$ -	\$ -	\$ -	\$ -	\$ -
Owner Indirects Contingency	\$ 30,002	\$ 30,002	\$ 30,002	\$ 22,501	\$ 15,001
Owner Contingency on EPC Contract	\$ 179,669	\$ 116,482	\$ 129,990	\$ -	\$ -
Total Contingency	\$ 209,670	\$ 146,483	\$ 159,991	\$ 22,501	\$ 15,001
Total Owner Cash Out	\$ 462,774	\$ 399,587	\$ 413,095	\$ 212,329	\$ 141,553
Total Monthly Cash Out	\$ 1,864,074	\$ 1,597,377	\$ 1,189,639	\$ 1,078,927	\$ 141,553
Total Cumulative Cash Out	\$ 82,872,890	\$ 84,470,267	\$ 85,659,907	\$ 86,738,833	\$ 86,880,386
Total Annual Cash Out					

Cash Flow

Estimated

Oct-14

Nov-14

Dec-14

Engineering		0.0%	0.0%	0.0%
Hours	-	-	-	-
Rate	\$ -	\$ -	\$ -	\$ -
Salary	\$ -	\$ -	\$ -	\$ -
Expenses	\$ -	\$ -	\$ -	\$ -
Total	\$ -	\$ -	\$ -	\$ -
EPC Procurements	-	-	-	-
Division 0 Civil/ Sitework	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -
Division 1 Foundations	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -
Division 2 - Structural Steel	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -
Division 3 - Pipe	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -
Division 5 - Electrical	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -
Division 6 - Instruments/ Controls	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -
Division 7 - Insulation/ Painting	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -
EPC Procurements Total	\$ -	\$ -	\$ -	\$ -
Craft Manhours				
Division 0 Civil/ Sitework	-	-	-	-
Division 1 Foundations	-	-	-	-
Division 2 - Structural Steel	-	-	-	-
Division 3 - Pipe	-	-	-	-
Division 4 - Equipment	-	-	-	-
Division 5 - Electrical	-	-	-	-
Division 6 - Instruments/ Controls	-	-	-	-
Division 7 - Insulation/ Painting	-	-	-	-
Division 8 - Construction Indirects	-	-	-	-
Total Craft Manhours	-	-	-	-
Total Craft labor Cost	\$ -	\$ -	\$ -	\$ -
EPC Subcontracts				
Division 0 Civil/ Sitework	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -
Division 1 Foundations	0.0%	0.0%	0.0%	0.0%
	\$ -	\$ -	\$ -	\$ -

Cash Flow

Estimated

Oct-14

Nov-14

Dec-14

Division 2 - Structural Steel	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -
Division 3 - Pipe	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -
Division 4 - Equipment	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -
Division 5 - Electrical	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -
Division 6 - Instruments/ Controls	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -
Division 7 - Insulation/ Painting	0.0%	0.0%	0.0%
\$ -	\$ -	\$ -	\$ -
Total EPC Subcontracts	\$ -	\$ -	\$ -
CM	0.0%	0.0%	0.0%
Hours	-	-	-
Rate	#DIV/0!	#DIV/0!	#DIV/0!
Salary	\$ -	\$ -	\$ -
Expenses	\$ -	\$ -	\$ -
Total	\$ -	\$ -	\$ -
Division 8 - Construction Indirects	-	-	-
Safety	\$ -	\$ -	\$ -
Mobilization / Demobilization	\$ -	\$ -	\$ -
Office / Field Overhead Expenses	\$ -	\$ -	\$ -
Site Services	\$ -	\$ -	\$ -
Equipment / ST&C	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ -
Pre-Op Startup & Testing	\$ -	\$ -	\$ -
Heavy Haul	\$ -	\$ -	\$ -
Total	\$ -	\$ -	\$ -
Total EPC Direct Cost	\$ -	\$ -	\$ -
Project Indirects			
Contingency	\$ -	\$ -	\$ -
Escalation	\$ -	\$ -	\$ -
Insurance			
Warranty			
Total Project Indirects	\$ -	\$ -	\$ -
Total Costs			
Hours	-	-	-
Rate	\$ -	\$ -	\$ -
Salary	\$ -	\$ -	\$ -
Expenses	\$ -	\$ -	\$ -
Total EPC Project Cost	\$ -	\$ -	\$ -

Cash Flow

Estimated

Oct-14

Nov-14

Dec-14

Invoice Sent to PE	\$ -	\$ -	\$ -
Invoice Paid by PE	\$ -	\$ -	\$ -
Cumulative Cash Out	\$ 28,169,403	\$ 28,169,403	\$ 28,169,403
Unit 1 ESP			
Unit 2 ESP			
Owner Labor & Indirects	\$ 77,788		\$ -
Escalation			
Owner Procurement Escalation	\$ -	\$ -	\$ -
Owner Indirects Escalation	\$ 48,764	\$ -	\$ -
Total Escalation	\$ 48,764	\$ -	\$ -
Contingency			
Owner Procurement Contingency	\$ -	\$ -	\$ -
Owner Indirects Contingency	\$ 15,001	\$ -	\$ -
Owner Contingency on EPC Contract	\$ -	\$ -	\$ -
Total Contingency	\$ 15,001	\$ -	\$ -
Total Owner Cash Out	\$ 141,553	\$ -	\$ -
Total Monthly Cash Out	\$ 141,553	\$ -	\$ -
Total Cumulative Cash Out	\$ 87,021,939	\$ 87,021,939	\$ 87,021,939
Total Annual Cash Out			\$ 14,385,877

Cash Flow
Estimated

	Total	Forecast
Engineering	100.0%	
Hours	20,000	20,000
Rate	\$ 70.00	\$ 70.00
Salary	\$ 1,400,000	\$ 1,400,000
Expenses	\$ 560,000	\$ 560,000
Total	\$ 1,960,000	\$ 1,960,000
EPC Procurements		
Division 0 Civil/ Sitework	\$ 750,000	\$ 750,000
Division 1 Foundations	\$ 207,222	\$ 207,222
Division 2 - Structural Steel	\$ 1,018,750	\$ 1,018,750
Division 3 - Pipe	\$ -	\$ -
Division 4 - Equipment	\$ 24,300	\$ 24,300
Division 5 - Electrical	\$ 3,025,775	\$ 3,025,775
Division 6 - Instruments/ Controls	\$ 894,250	\$ 894,250
Division 7 - Insulation/ Painting	\$ -	\$ -
EPC Procurements Total	5,920,297	5,920,297
Craft Manhours		
Division 0 Civil/ Sitework	1,000	1,000
Division 1 Foundations	2,552	2,552
Division 2 - Structural Steel	8,250	8,250
Division 3 - Pipe	-	-
Division 4 - Equipment	57,588	57,588
Division 5 - Electrical	22,544	22,544
Division 6 - Instruments/ Controls	2,750	2,750
Division 7 - Insulation/ Painting	-	-
Division 8 - Construction Indirects	7,149	7,149
Total Craft Manhours	101,832	101,832
Total Craft labor Cost	4,847,861	4,847,861
EPC Subcontracts		
Division 0 Civil/ Sitework	\$ 640,800	\$ 640,800
Division 1 Foundations	\$ 16,296	\$ 16,296

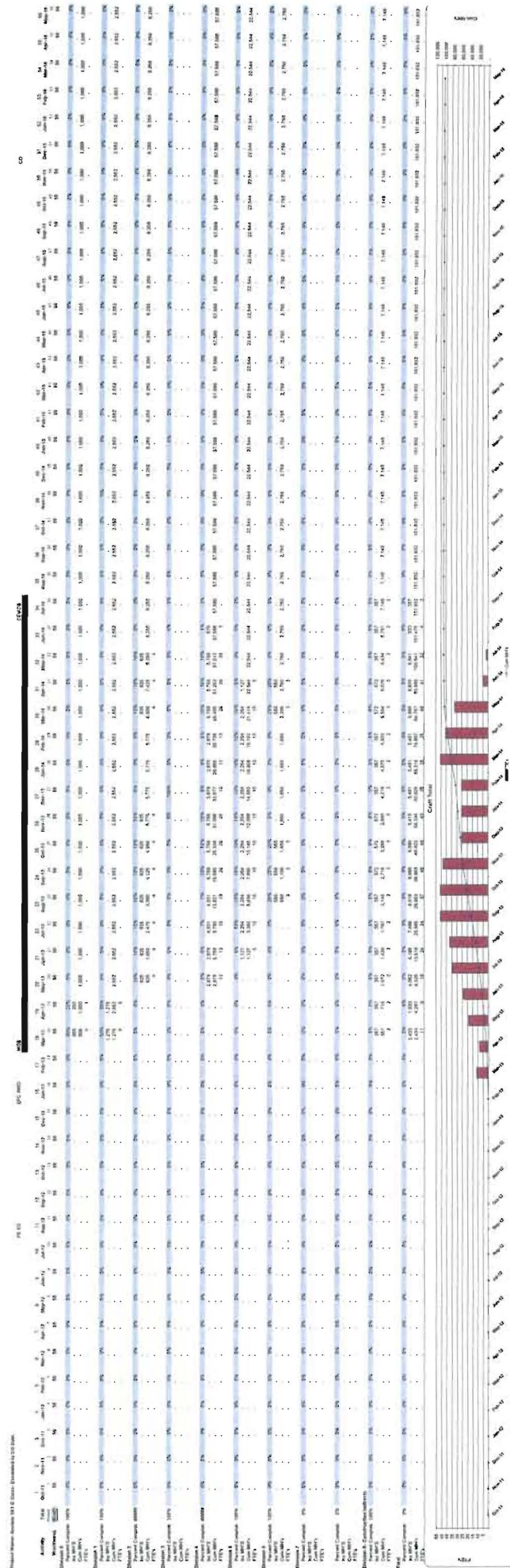
Cash Flow
Estimated

	Total	Forecast
Division 2 - Structural Steel		
	\$ -	\$ -
Division 3 - Pipe		
	\$ -	\$ -
Division 4 - Equipment		
	\$ -	\$ -
Division 5 - Electrical		
	\$ -	\$ -
Division 6 - Instruments/ Controls		
	\$ -	\$ -
Division 7 - Insulation/ Painting		
	\$ 1,360,000	\$ 1,360,000
Total EPC Subcontracts	2,017,096	2,017,096
CM		
Hours	18,031	18,031
Rate	\$ 65.76	\$ 65.76
Salary	\$ 1,185,717	\$ 1,185,717
Expenses	\$ 458,850	\$ 458,850
Total	\$ 1,644,567	\$ 1,644,567
Division 8 - Construction Indirects		
Safety	\$ 116,366	\$ 116,366
Mobilization / Demobilization	\$ 31,537	\$ 31,537
Office / Field Overhead Expenses	\$ 37,328	\$ 37,328
Site Services	\$ 610,393	\$ 610,393
Equipment / ST&C	\$ 1,481,794	\$ 1,481,794
Other	\$ 276,230	\$ 276,230
Pre-Op Startup & Testing	\$ 79,038	\$ 79,038
Heavy Haul	\$ -	\$ -
Total	\$ 2,632,687	\$ 2,632,687
Total EPC Direct Cost	\$ 19,022,509	
Project Indirects		
Contingency	\$ 1,934,228	\$ 1,934,228
Escalation	\$ 3,268,629	\$ 3,268,629
Insurance	\$ 112,315	\$ 133,136
Warranty	\$ 157,452	\$ 186,639
Total Project Indirects	\$ 5,472,625	\$ 5,522,632
Total Costs		
Hours	139,863	139,863
Rate	\$ 53.15	\$ 53.15
Salary	\$ 7,433,578	\$ 7,433,578
Expenses	\$ 17,061,555	\$ 17,111,563
	\$ 24,495,133	\$ 24,545,141
Total EPC Project Cost	\$ 24,495,133	\$ 24,545,141

PEF-120103-EI-00032

Cash Flow
Estimated

	Total	Forecast
Invoice Sent to PE	\$ 28,169,403	\$ 28,226,912
Invoice Paid by PE	\$ 28,169,403	\$ 28,226,912
Cumulative Cash Out		
Unit 1 ESP	\$ 18,000,000	\$ 18,000,000
Unit 2 ESP	\$ 18,000,000	\$ 18,000,000
	\$ -	\$ -
	\$ -	\$ -
	\$ -	\$ -
	\$ -	\$ -
	\$ -	\$ -
	\$ -	\$ -
Owner Labor & Indirects	\$ 3,889,398	\$ 3,889,398
Escalation		
Owner Procurement Escalation	\$ 6,149,495	\$ 6,149,495
Owner Indirects Escalation	\$ 2,438,186	\$ 2,438,186
Total Escalation		
Contingency		
Owner Procurement Contingency	\$ 5,400,000	\$ 5,400,000
Owner Indirects Contingency	\$ 750,045	\$ 750,045
Owner Contingency on EPC Contract	\$ 4,225,411	\$ 4,234,037
Total Contingency		
Total Owner Cash Out	\$ 58,852,535	\$ 58,861,162
Total Monthly Cash Out	\$ 87,021,939	\$ 87,088,073
Total Cumulative Cash Out	\$ 87,021,939	\$ 87,088,073
Total Annual Cash Out	\$ 87,021,939	



Supervision Estimate Sheet



Project : Anclote Unit 1 & Unit 2 ESP

	Classification	Wage Rate	% of Time on Project	MH's	Salary \$'s	Expenses	Total
x	Corporate- Home Office Support						
x	Management						
x	Home Office- Division-Management	\$ 100.00	20%	766	\$ 76,560	\$ 30,624	\$ 107,184
x	Home Office- Project Manager	\$ 80.00	20%	870	\$ 69,600	\$ 27,840	\$ 97,440
x	Home Office- PM- Construction	\$ 75.00	15%	957	\$ 71,775	\$ 28,710	\$ 100,485
x	Home Office- Project Controls- Cost / Schedule	\$ 55.00	20%	2,088	\$ 114,840	\$ 45,936	\$ 160,776
x	Home Office- T&D	\$ 70.00	20%	-	\$ -	\$ -	\$ -
x	Engineering / Procurement / Startup						
x	Home Office Engineering	\$ 55.00	20%	1,061	\$ 58,377	\$ 23,351	\$ 81,728
x	Home Office- Startup	\$ 55.00	5%	-	\$ -	\$ -	\$ -
x	Home Office- Procurement / Contracts	\$ 50.00	20%	-	\$ -	\$ -	\$ -
x	Home Office- Expediting	\$ 50.00	20%	-	\$ -	\$ -	\$ -
x	Support						
x	Planning / Permitting / Development	\$ 55.00	20%	218	\$ 11,963	\$ 4,785	\$ 16,748
x	Estimating Support	\$ 55.00	20%	-	\$ -	\$ -	\$ -
x	Home Office- Safety / Environmental	\$ 50.00	5%	766	\$ 38,280	\$ 15,312	\$ 53,592
x	Home Office- Business Services	\$ 40.00	5%	2,088	\$ 83,520	\$ 33,408	\$ 116,928
x	Home Office- QA / QC	\$ 50.00	5%	-	\$ -	\$ -	\$ -
x	Home Office- Legal	\$ 60.00	5%	70	\$ 4,176	\$ 1,670	\$ 5,846
x	Home Office Cnst Support- Accounting	\$ 40.00	20%	-	\$ -	\$ -	\$ -
x	Home Office- Taxes / Insurance / Other	\$ 45.00	5%	-	\$ -	\$ -	\$ -
x	Home Office- Audit / Regulator Insurance	\$ 45.00	10%	-	\$ -	\$ -	\$ -
x	Home Office- Admin / Doc Control Support	\$ 35.00	5%	-	\$ -	\$ -	\$ -
x	Misc Home Office Cnst Support	\$ 45.00	10%	-	\$ -	\$ -	\$ -
x	Total: Corporate- Home Office			8,883	\$ 629,091	\$ 211,636	\$ 740,727
x	Corporate- Site						
x	Field Management						
x	Site Manager	\$ 60.00	100%	3,698	\$ 221,850	\$ 73,157	\$ 295,007
x	Construction Manager	\$ 55.00	100%	3,698	\$ 203,363	\$ 67,061	\$ 270,423
x	Project Controls Manager	\$ 50.00	100%	-	\$ -	\$ -	\$ -
x	Cost Engineer(s)	\$ 45.00	100%	-	\$ -	\$ -	\$ -
x	Scheduler(s)	\$ 45.00	100%	-	\$ -	\$ -	\$ -
x	Admin Manager	\$ 40.00	100%	-	\$ -	\$ -	\$ -
x	Purchasing Manager	\$ 45.00	100%	-	\$ -	\$ -	\$ -
x	Subcontracts Manager	\$ 45.00	100%	-	\$ -	\$ -	\$ -
x	Materials Manager	\$ 45.00	100%	-	\$ -	\$ -	\$ -
x	Safety Manager	\$ 45.00	100%	-	\$ -	\$ -	\$ -
x	QA/QC Manager	\$ 45.00	100%	-	\$ -	\$ -	\$ -
x	Field Management- T&D	\$ 50.00	100%	-	\$ -	\$ -	\$ -
x	Superintendents / Technicians						
x	Project Superintendent	\$ 45.00	100%	-	\$ -	\$ -	\$ -
x	General Superintendent	\$ 43.00	100%	-	\$ -	\$ -	\$ -
x	Civil Superintendent	\$ 42.00	100%	-	\$ -	\$ -	\$ -
x	Structural Superintendent	\$ 42.00	100%	-	\$ -	\$ -	\$ -
x	Mechanical Superintendent	\$ 42.00	100%	-	\$ -	\$ -	\$ -
x	Millwright Superintendent	\$ 42.00	100%	-	\$ -	\$ -	\$ -
x	Pipe Superintendent	\$ 42.00	100%	-	\$ -	\$ -	\$ -
x	Electrical Superintendent	\$ 42.00	100%	-	\$ -	\$ -	\$ -
x	Instrumentation Superintendent	\$ 42.00	100%	-	\$ -	\$ -	\$ -
x	Construction Facilitator	\$ 42.00	100%	-	\$ -	\$ -	\$ -
x	QA/QC Tech	\$ 40.00	100%	-	\$ -	\$ -	\$ -
x	Safety Tech	\$ 40.00	100%	-	\$ -	\$ -	\$ -
x	Field Engineering						
x	General Field Engineer	\$ 45.00	100%	-	\$ -	\$ -	\$ -
x	Civil / Structural Field Engineer	\$ 45.00	100%	-	\$ -	\$ -	\$ -
x	Mechanical Field Engineer	\$ 45.00	100%	-	\$ -	\$ -	\$ -
x	Electrical Field Engineer	\$ 45.00	100%	-	\$ -	\$ -	\$ -
x	I&C Field Engineer	\$ 45.00	100%	-	\$ -	\$ -	\$ -
x	Subcontracts Coordinator	\$ 45.00	100%	-	\$ -	\$ -	\$ -
x	Startup						
x	Startup Manager	\$ 60.00	100%	2,610	\$ 156,600	\$ 51,641	\$ 208,241
x	Startup: Mechanical Engineer	\$ 50.00	100%	-	\$ -	\$ -	\$ -
x	Startup: Electrical Engineer	\$ 50.00	100%	-	\$ -	\$ -	\$ -
x	Startup I&C Engineer	\$ 50.00	100%	-	\$ -	\$ -	\$ -
x	Startup Field Engineer	\$ 50.00	100%	-	\$ -	\$ -	\$ -
x	Other						
x	Secretary	\$ 60.00	100%	-	\$ -	\$ -	\$ -
x	Operations	\$ 50.00	100%	-	\$ -	\$ -	\$ -
x	Integration Team	\$ 50.00	100%	-	\$ -	\$ -	\$ -
x	Other	\$ 50.00	100%	-	\$ -	\$ -	\$ -
x	Total: Corporate- Site			10,005	\$ 681,813	\$ 191,859	\$ 773,671
x	Contract CM						
x	Project Controls	\$ 125.00	100%	-	\$ -	\$ -	\$ -
x	Engineering	\$ 125.00	100%	-	\$ -	\$ -	\$ -
x	Legal	\$ 250.00	100%	-	\$ -	\$ -	\$ -
x	Other	\$ 125.00	100%	-	\$ -	\$ -	\$ -
x	Total: Contract CM			-	\$ -	\$ -	\$ -
x	Total CM (Corporate/Contract)	\$ 58.82		18,888	\$ 1,110,903	\$ 403,495	\$ 1,514,398

PEF-120103-EI-00035

Short Form Estimate

Project: Ancolte Units 1 & 2 Nox Reduction Spring 2014

Project #: TBD

Description: Mechanical to Steam Atomization Conversion & Low Nox Atomizers Ancolte Units 1 & 2.

Estimators: JBJ
Est #: 110
CO#: NA
Est Due Date: 22-Apr-09
Estimate Type: Class 5



Progress Energy

Progress Curve: Monthly
Mob Date: 1-Apr-13
Demob Date: 1-Jun-14

Construction

Description	Qty	U/M	\$/UM	\$'s per MH	MH/UM	PF	MH's	Material / Sub	\$'s	Labor's	Total \$'s
Direct Construction Costs											
Unit 1											
-Pre Outage											
Mobilize	1	LS	\$ 12,500.00	\$ 48.89	250.00	1.00	250	\$ 12,500	\$ -	\$ 12,222	\$ 24,722
Stage Equipment & Setup Area	1	LS	\$ 7,500.00	\$ 48.89	150.00	1.00	150	\$ 7,500	\$ -	\$ 7,333	\$ 14,833
Setup / Teardown Scaffolding	1	LS	\$ 31,200.00	\$ 48.89	-	1.00	-	\$ 31,200	\$ -	\$ -	\$ 31,200
Install New 8" CS Line	150	LF	\$ 42.00	\$ 48.89	1.44	1.25	270	\$ 6,300	\$ 13,200	\$ -	\$ 19,500
Install New 2" CS Line	1,500	LF	\$ 10.00	\$ 48.89	0.61	1.25	1,144	\$ 15,000	\$ 55,915	\$ -	\$ 70,915
Fittings	35%	PCT	\$ 21,300.00	\$ 48.89	-	1.00	-	\$ 7,455	\$ -	\$ -	\$ 7,455
Insulate 8" Line	150	LF	\$ 45.00	\$ 48.89	-	1.00	-	\$ 6,750	\$ -	\$ -	\$ 6,750
Insulate 2" Line	1,500	LF	\$ 35.00	\$ 48.89	-	1.00	-	\$ 52,500	\$ -	\$ -	\$ 52,500
Hangers	165	EA	\$ 150.00	\$ 48.89	5.00	1.25	1,031	\$ 24,750	\$ 50,415	\$ -	\$ 75,165
Install Regulating Valve- 8"	1	EA	\$ 25,000.00	\$ 48.89	10.00	1.25	13	\$ 25,000	\$ 611	\$ -	\$ 25,611
Install Transmitters	40	EA	\$ 550.00	\$ 48.89	5.00	1.25	250	\$ 22,000	\$ 12,222	\$ -	\$ 34,222
Install Conduit	1,600	LF	\$ 12.00	\$ 48.89	0.42	1.25	840	\$ 19,200	\$ 41,066	\$ -	\$ 60,266
Install Cable	10,000	LF	\$ 2.75	\$ 48.89	0.03	1.25	375	\$ 27,500	\$ 18,333	\$ -	\$ 45,833
Terms	400	EA	\$ 2.50	\$ 48.89	0.25	1.25	125	\$ 1,000	\$ 6,111	\$ -	\$ 7,111
-Outage											
Tie-in to existing Steam Line- 8"	1	EA	\$ 3,500.00	\$ 48.89	30.00	1.00	30	\$ 3,500	\$ -	\$ 1,467	\$ 4,967
Install Steam Atomizer Assembly	20	EA	\$ -	\$ 48.89	5.00	1.00	100	\$ -	\$ -	\$ 4,889	\$ 4,889
Tie-in new 2" Line to Steam Atomizer Assembly	20	EA	\$ -	\$ 48.89	15.00	1.00	300	\$ -	\$ -	\$ 14,666	\$ 14,666
Startup / Functional Tests	1	LS	\$ 2,500.00	\$ 48.89	150.00	1.00	150	\$ 2,500	\$ 7,333	\$ -	\$ 9,833
-Post Outage											
Cleanup / Demob	1	LS	\$ -	\$ 48.89	400.00	1.00	400	\$ -	\$ -	\$ 19,555	\$ 19,555
Unit 2											
-Pre Outage											
Mobilize	1	LS	\$ 12,500.00	\$ 48.89	250.00	1.00	250	\$ 12,500	\$ -	\$ 12,222	\$ 24,722
Stage Equipment & Setup Area	1	LS	\$ 7,500.00	\$ 48.89	150.00	1.00	150	\$ 7,500	\$ -	\$ 7,333	\$ 14,833
Setup / Teardown Scaffolding	1	LS	\$ 31,200.00	\$ 48.89	-	1.00	-	\$ 31,200	\$ -	\$ -	\$ 31,200
Install New 8" CS Line	150	LF	\$ 37.50	\$ 48.89	1.44	1.25	270	\$ 5,625	\$ 13,200	\$ -	\$ 18,825
Install New 2" CS Line	1,500	LF	\$ 7.00	\$ 48.89	0.61	1.25	1,144	\$ 10,500	\$ 55,915	\$ -	\$ 66,415
Fittings	25%	PCT	\$ 16,125.00	\$ 48.89	-	1.00	-	\$ 4,031	\$ -	\$ -	\$ 4,031
Insulate 8" Line	150	LF	\$ 45.00	\$ 48.89	-	1.00	-	\$ 6,750	\$ -	\$ -	\$ 6,750
Insulate 2" Line	1,500	LF	\$ 35.00	\$ 48.89	-	1.00	-	\$ 52,500	\$ -	\$ -	\$ 52,500
Hangers	165	EA	\$ 75.00	\$ 48.89	5.00	1.25	1,031	\$ 12,375	\$ 50,415	\$ -	\$ 62,790
Install Regulating Valve- 8"	1	EA	\$ 17,500.00	\$ 48.89	10.00	1.25	13	\$ 17,500	\$ 611	\$ -	\$ 18,111
Install Transmitters	40	EA	\$ 350.00	\$ 48.89	5.00	1.25	250	\$ 14,000	\$ 12,222	\$ -	\$ 26,222
Install Conduit	1,600	LF	\$ 12.00	\$ 48.89	0.42	1.25	840	\$ 19,200	\$ 41,066	\$ -	\$ 60,266
Install Cable	10,000	LF	\$ 2.75	\$ 48.89	0.03	1.25	375	\$ 27,500	\$ 18,333	\$ -	\$ 45,833
Terms	400	EA	\$ 2.50	\$ 48.89	0.25	1.25	125	\$ 1,000	\$ 6,111	\$ -	\$ 7,111
-Outage											
Tie-in to existing Steam Line- 8"	1	EA	\$ 3,500.00	\$ 48.89	30.00	1.00	30	\$ 3,500	\$ -	\$ 1,467	\$ 4,967
Install Steam Atomizer Assembly	20	EA	\$ -	\$ 48.89	5.00	1.00	100	\$ -	\$ -	\$ 4,889	\$ 4,889
Tie-in new 2" Line to Steam Atomizer Assembly	20	EA	\$ -	\$ 48.89	15.00	1.00	300	\$ -	\$ -	\$ 14,666	\$ 14,666
Startup / Functional Tests	1	LS	\$ 2,500.00	\$ 48.89	150.00	1.00	150	\$ 2,500	\$ 7,333	\$ -	\$ 9,833
-Post Outage											
Cleanup / Demob	1	LS	\$ -	\$ 48.89	400.00	1.00	400	\$ -	\$ -	\$ 19,555	\$ 19,555
Total Direct Construction Costs											
								10,855	\$ 492,836	\$ 530,675	\$ 1,023,511
Indirect Construction Costs											
Freight	2%	LS	\$ 492,836	\$ 48.89	-	1.00	-	\$ 9,857	\$ -	\$ -	\$ 9,857
Safety Incentive	1	LS	\$ 0.50	\$ 48.89	-	1.00	-	\$ -	\$ -	\$ 5,898	\$ 5,898
Craft Training Certification / Weld Testing	20	LS	\$ 75.00	\$ 48.89	5.00	1.00	100	\$ 1,500	\$ 4,889	\$ -	\$ 6,389
Craft Hire-in	34	LS	\$ 50.00	\$ 48.89	10.00	1.00	340	\$ 1,700	\$ 16,622	\$ -	\$ 18,322
Travel time	-	LS	\$ -	\$ 48.89	20.00	1.00	-	\$ -	\$ -	\$ -	\$ -
Temp Facilities	1	LS	\$ 10,000.00	\$ 48.89	-	1.00	-	\$ 10,000	\$ -	\$ -	\$ 10,000
Mobilize	-	LS	\$ -	\$ 48.89	-	1.00	-	\$ -	\$ -	\$ -	\$ -
Cleanup / De-Mobilize	-	LS	\$ -	\$ 48.89	-	1.00	-	\$ -	\$ -	\$ -	\$ -
Small Tools/Consumables	1	LS	\$ 4.00	\$ 48.89	-	1.00	-	\$ 47,180	\$ -	\$ -	\$ 47,180
Scaffolding	1	LS	\$ -	\$ 48.89	-	1.00	-	\$ -	\$ -	\$ -	\$ -
Permits	1	LS	\$ -	\$ 48.89	-	1.00	-	\$ -	\$ -	\$ -	\$ -
Startup/Testing	1	LS	\$ -	\$ 48.89	-	1.00	-	\$ -	\$ -	\$ -	\$ -
Safety Equipment	1	LS	\$ 0.50	\$ 48.89	-	1.00	-	\$ 5,898	\$ -	\$ -	\$ 5,898
Temp Utilities	1	LS	\$ 5,000.00	\$ 48.89	100.00	1.00	100	\$ 5,000	\$ 4,889	\$ -	\$ 9,889
Site Services	1	LS	\$ 5,000.00	\$ 48.89	400.00	1.00	400	\$ 5,000	\$ 19,555	\$ -	\$ 24,555
Trash Dumpsters	1	LS	\$ 1,500.00	\$ 48.89	-	1.00	-	\$ 1,500	\$ -	\$ -	\$ 1,500
Total Indirect Construction Costs								940	\$ 87,634	\$ 51,852	\$ 139,486
Total								11,795	\$ 580,470	\$ 582,527	\$ 1,162,997

Equipment/Rentals	\$/Month	In / Out	# of Pieces	Start Date	End Date	Total	Craft Wage Rate Calculation
Office Trailer- Single Wide	\$ 400	\$ 1,500				\$ -	Base Wage Rate
Welders- Portable	\$ 495	\$ 150				\$ -	Description # of Persons Wage
Welders- 8 Bank	\$ 950	\$ 200				\$ -	GF 1 \$ 32.50
JLG- 40'	\$ 1,800	\$ 300				\$ -	Foreman 10 \$ 30.00
JLG- 60'	\$ 2,400	\$ 300				\$ -	Journeyman 70 \$ 28.00
Lull- 10,000#	\$ 4,800	\$ 300				\$ -	Craft Helper 10 \$ 20.00
Compressor/Tank- 185 CFM	\$ 440	\$ 100				\$ -	Laborer 5 \$ 14.00
Port-a-Johns	\$ 100	\$ -				\$ -	Total 96
Crane- 17 Ton	\$ 3,200	\$ 2,000				\$ -	Planned Hours per Week 55
Crane- 60Ton	\$ 8,500	\$ 5,000				\$ -	Base Wage Rate Inc OT \$ 30.33
Rigging / Gang boxes / Other	\$ 1,500	\$ 250				\$ -	
Truck	\$ 950	\$ -				\$ -	Labor Burden
Generator	\$ 450	\$ 150				\$ -	Workman's Comp 5.00% \$ 1.33
						\$ -	Craft Ins/Tax/Benefit 20.00% \$ 5.34
						\$ -	Retention / Other 1.00 \$ 1.00
						\$ -	Labor Burden \$ 7.87
						\$ -	Fully Burdened Craft Wage Rate \$ 48.89
						\$ -	Perdiem/MH Calculation
input for Construction Expt \$'s/Direct MH	\$ 14.00					\$ 151,970	Planned Perdiem Per Week 630
Fuel / Equipment Maintenance	12%					\$ 18,236	Planned % of Craft w/ Per-Diem 95%
Total Equipment	\$ / Direct MH		\$ 15.68			\$ 170,206	Average Per-Diem \$/MH \$ 10.88

Home Office

CM MH Breakdown

Short Fo

Project: Anclore Units 1 & 2 Nox Reduction Spring 2014

Project #: TBD

Description: Mechanical to Steam Atomization Conversion & Low Nox Atomizers Anclore Units 1 & 2.

Estimators: JBJ

Est #: 110

CO#: NA

Est Due Date: 22-Apr-09

Estimate Type: Class 5



Progress Energy

Progress Curve: Monthly

Mod Date: 1-Apr-13

Demob Date: 1-Jun-14

Construction

Description	Qty	U/M	\$/UM	\$'s per MH	MH/UM	PF	MH's	\$'s	Labor's	Total \$'s
Engineering										
Salary	\$ 70.00	50		\$ 3,500						
Burden	\$ -		40%	\$ 1,400						
Expenses (including Computer)	\$ -		50%	\$ 1,750						
Total Engineering		50		\$ 6,650						
CM										
Salary	\$ 55.00	2,634		\$ 144,866						
Burden	\$ -		45%	\$ 65,190						
Expenses (including Pen-Down & Computer)	\$ -		50%	\$ 72,433						
Total CM		2,634		\$ 282,489						
EPC Project Indirects										
General Liability & Excess GL Ins.	0.15%			\$ 2,596						
Builders Risk Insurance	0.00%			\$ -						
Warranty	1.0%			\$ 16,223						
Taxes	7.0%			\$ 52,547						
Escalation	15.0%			\$ 242,354						
Contingency	10.0%			\$ 168,706						
Total Project Indirects				\$ 482,426						
EPC Project Summary										
EPC Total Project Cost			\$ 2,104,769							
EPC G&A	5.0%		\$ 105,238							
EPC Fee	10.0%		\$ 210,477							
Total EPC Contract Value			\$ 2,420,484							
Construction Indicators										
Direct MH's / CM					4.1					
Construction Equipment / Direct MH					\$ 15.68					
EPC Value / Engineered Equipment \$'s					3.46					
All-In Craft Rate inc Eqp't, ST&C, CM, Cont, Esc, OH&P					133.28					
Engineering / Total Project					0.3%					
Material / Sub										
Description	% Time	Start Date	Finish Date	MH						
Site Mngr	50%	1-Feb-09	1-Apr-09	211						
Project Manager-Construction				-						
Civil Supt				-						
Mechanical Supt	200%	1-Feb-09	1-Apr-09	843						
I&E Supt	50%	1-Feb-09	1-Apr-09	211						
Admin Mngr	125%	1-Feb-09	1-Apr-09	527						
Project Controls	50%	1-Feb-09	1-Apr-09	211						
QA/QC Mngr	50%	1-Feb-09	1-Apr-09	211						
Safety Mngr	50%	1-Feb-09	1-Apr-09	211						
Materials Mngr				-						
Misc	50%	1-Feb-09	1-Apr-09	211						
CM Total	Hours per week	50		2,634						
EPC Engineering / H.O. MH Breakdown										
Description	MH									
Project Manager	-									
Engineering Manager	-									
Accounting	-									
Project Controls	-									
Civil Engineering	-									
Mechanical Engineering	-									
Electrical / I&C Engineering	-									
Chemical	-									
Misc- Insurance / Taxes etc	50									
Engineering/HO Total	50									

Progress Energy Procurement / Staff / OH's and Indirects.

Progress Energy Staff										
Salary	\$ 50.00	2,530		\$ 126,500						
Expense	\$ -		40%	\$ 50,600						
Total PE Staff				\$ 177,100						
Progress Energy Procurement										
Engineering- Unit 1	1 LS		\$ 350,000.00	\$ 350,000						
Engineering- Unit 2	1 LS		\$ 150,000.00	\$ 150,000						
Steam Atomizer Assembly- Unit 1 & 2	2 EA		\$ 100,000.00	\$ 200,000						
Total PE Procurement				\$ 700,000						
Progress Energy Indirects										
BR Insurance	0.75%	PCT	\$ -	\$ 28,442						
Construction Facilities / Utilities	4.0	Mnths	\$ 5,000.00	\$ 20,000						
Startup Fuels		LS	\$ -	\$ -						
Vehicles	4.0	Mnths	\$ 1,000.00	\$ 4,000						
Spares	1%	PCT	\$ 700,000.00	\$ 7,000						
Training	1.0	LS	\$ 10,000.00	\$ 10,000						
Other			\$ -	\$ -						
Total PE Indirects				\$ 69,442						
Progress Energy Escalation, Contingency, Other										
Escalation- EPC Contractor			0.0%	\$ -						
Escalation- PE Procurement			15.0%	\$ 105,000						
Escalation- PE Staff & Indirects			15.0%	\$ 36,981						
Contingency- EPC Contractor			10.0%	\$ 242,048						
Contingency- PE Procurement			7.5%	\$ 52,500						
Contingency- PE Staff & Indirects			5.0%	\$ 12,327						
Other			0.0%	\$ -						
Total PE Escalation, Contingency, Other				\$ 448,857						
Total Project Cost- Project View				\$ 3,815,883						
Progress Energy Staff										
Description	MH									
HO Project Management	100									
HO Engineering	250									
HO Pjct Cntrl / Est / Bus Serv	200									
HO Other	100									
Field Site Mngr / CM	200									
Field Engineering	880									
Field PC's	-									
Field Superintendent	-									
Field Safety / QA/QC	200									
Field Startup	400									
Field Other	200									
Engineering/HO Total	2,530									
Craft Total										
Apr-13										
May-13										
Jun-13										
Jul-13										
Aug-13										
Sep-13										
Oct-13										
Nov-13										
Dec-13										
Jan-14										
Feb-14										
Mar-14										
Apr-14										
May-14										
Jun-14										
Estimate Range										
Min %	Max %	Min \$'s	Most Likely \$'s	Max \$'s						
EPC Contractor	-25%	35%	\$ 1,815,363	\$ 2,420,484	\$ 3,267,654					
PE Procurement	-5%	15%	\$ 665,000	\$ 700,000	\$ 805,000					
PE Staff	-15%	20%	\$ 150,535	\$ 177,100	\$ 212,520					
PE Ind/Cont/Esc	-10%	20%	\$ 466,469	\$ 518,298	\$ 621,958					
Total			\$ 3,097,367	\$ 3,815,883	\$ 4,907,132					

Notes / Assumptions / Clarifications / Exceptions

- All Values are in Project View unless stated otherwise.
- Assume the existing FO return line is not suitable for use as a steam line and a new steam line needs to be installed.
- Estimate escalated to In-Service Dates noted
- Assume can re-use existing oil guns.
- Estimate includes all PE costs such as PE staff, contingency, escalation indirects etc
- Assumed a EPC LS Contract
- Assume abandon existing FO return line in place
- The estimate assumes that the no other work will be accruing during this timeframe. If additional projects are occurring during this time, the PE staffing MH's can be reduced.

Projected Annual Cash Flow	2009	2010	2011	2012	2013	2014	2015
	\$0	\$0	\$0	\$0	\$2,289,530	\$1,526,353	\$0

Estimate Review Summary Form



Anclole Boiler Gas Conversion

Description: This estimate covers the scope to convert Anclole U1 and U2 from fuel oil to fuel gas. Unit 1 is in-service in the Spring of 2013 and Unit 2 follows in the Fall of 2013.

Estimate Requested by:	Resource Planning	Estimate #:	190.3	Award Date:	1-Jan-13
Estimate Preparation Date:	9-Sep-11	Plant:	Anclole	Cnst Mob Date:	1-Jan-13
Estimated by:	Moody	Type of Contract:	Firm Price	Commercial Op Date:	31-Dec-13

Estimate Purpose	Notes	Escalation
Study		Escalated to CO date: Dec-13
Estimate Basis:	Notes	Estimate Class (AACE):
Technology identified, Site Identified, Prelim engineering not complete.		Class 5- Conceptual Screening (L: -20% to -50% / H: +30% to +100%)

Major Assumptions / Clarifications:

- No significant engineering has been performed and site specific characteristics have not been fully analyzed.
- Both units are converted under a single lump sum construction contract under a single mobilization with separate In-Service dates.
- Includes the cost of upgrades to the M&R station.
- Includes the gas line from the M&R station to the units.
- Includes the DCS upgrades for the burner scope only.
- BMS is 2003 vintage, includes a BMS Logic Review (Outside) and internal Programming.
- Excludes Flue Gas Recirculation.
- Includes flushing and demolition of the existing fuel oil supply and return piping from the existing fuel oil burners to the fuel oil booster house.
- Excludes demolition of any fuel oil infrastructure from and including the Fuel Oil Booster pumps, Fuel Oil Storage Tanks, Fuel Oil transmission line and associated infrastructure such as heat tracing.
- Excludes modifications to the existing gas burners EXCEPT for changing the existing light oil igniters to gas igniters.
- This estimate assumes that the units will be converted to 100% gas; co firing is excluded.
- The impact on the relocation of any underground utilities or other interferences is undetermined. No allowance is included for the relocation of underground utilities or other underground mitigations.
- Chemical cleaning of the SH tubes (if required) is performed by the vendor prior to shipment.
- Hydro cleaning of the SH tubes is not required. During startup, screens are used to catch any debris before entering the STG.
- The new fuel gas burners will be installed at different elevations than where the existing fuel oil burners are currently located.
- AFUDC is allowable. The threshold for AFUDC at the time of the estimate is \$66.5M.
- Excludes any fan work (FD Fans only - not balanced draft).
- Excludes the remediation and disposal of hazardous waste such as contaminated soil.
- Includes disposal of the demolished pipe in a hazardous materials landfill.
- The Plant will remove all #6 Fuel Oil Alarms and Light Oil Alarms from the DCS. They will de-terminate the #6 Fuel Oil field points and Light Oil field points no longer used in the Bailey Panel as well. The labor for this is included in the PGN Staffing Plan.

Estimate Breakdown	Min %	Max %	Min \$'s	Most Likely \$'s	Max \$'s
EPC Contract Costs	-25%	25%	\$ 21,008,486	\$ 28,011,314	\$ 35,014,143
Progress Energy Provided Procurement Costs	-25%	25%	\$ 23,817,882	\$ 31,757,176	\$ 39,696,471
Progress Energy Labor Costs	-15%	25%	\$ 1,898,006	\$ 2,232,948	\$ 2,791,186
Progress Energy Indirect Material Costs	-25%	30%	\$ 1,868,864	\$ 2,491,818	\$ 3,239,364
Total Project Cost Validity Range			\$ 48,593,238	\$ 64,493,257	\$ 80,741,162
Progress Energy Contingency - Estimate Uncertainty				\$ 5,751,322	
Progress Energy Escalation				\$ 1,232,614	
Total (Project View)			\$ 48,593,238	\$ 71,477,193	\$ 80,741,162
Total Fin View Adder - 55% PGN Labor				\$ 827,349	
Financial View Total			\$ 48,593,238	\$ 72,304,542	\$ 80,741,162
Estimated AFUDC				\$ 5,060,384	
Grand Total (Fin View) including AFUDC				\$ 77,364,926	

Department Review & Approval

Technical:

Name _____ Date _____

Commercial:

Name _____ Date _____

Construction / Procurement / Other:

Name _____ Date _____

Name _____ Date _____

Management:

Jeff Moody _____ Date _____

Leigh Formanek _____ Date _____

Joel Rutledge _____ Date _____

Joel Moran _____ Date _____

Andy MacGregor _____ Date _____

_____ Date _____

_____ Date _____

_____ Date _____

Anclote Boiler Gas Conversion



Description: This estimate covers the scope to convert Anclote U1 and U2 from fuel oil to fuel gas. Unit 1 is in-service in the Spring of 2013 and Unit 2 follows in the Fall of 2013.

Class	5 - Conceptual	Region	Florida	PE Proj Kickoff	January-2011
Estimate Range	25% to -25%	Plant	Anclote	EPC Mobilize	January-2013
Type of Contract	Firm Price	Unit	U1 & U2	Unit 1 Outage	March-2013
Estimate #	190 3	Estimate Due	9-Sep-11	Unit 2 Outage	September-2013
Proposal Number	NA	Estimator(s)	Moody	COD	December-2013

Notes & Assumptions

- No significant engineering has been performed and site specific characteristics have not been fully analyzed.
- Both units are converted under a single lump sum construction contract under a single mobilization with separate In-Service dates.
- Includes the cost of upgrades to the M&R station.
- Includes the gas line from the M&R station to the units.
- BMS is 2003 vintage, includes a BMS Logic Review (Outside) and internal Programming.
- Excludes Flue Gas Recirculation.
- Includes flushing and demolition of the existing fuel oil supply and return piping from the existing fuel oil burners to the fuel oil booster house.
- Excludes demolition of any fuel oil infrastructure from and including the Fuel Oil Booster pumps, Fuel Oil Storage Tanks, Fuel Oil transmission line and associated infrastructure such as heat tracing.
- Excludes modifications to the existing gas burners EXCEPT for changing the existing light oil igniters to gas igniters.
- This estimate assumes that the units will be converted to 100% gas; co-firing is excluded.

- The impact on the relocation of any underground utilities or other interferences is undetermined. No allowance is included for the relocation of underground utilities or other underground mitigations.
- Chemical cleaning of the SH tubes (if required) is performed by the vendor prior to shipment.
- Hydro cleaning of the SH tubes is not required. During startup, screens are used to catch any debris before entering the STG.
- The new fuel gas burners will be installed at different elevations than where the existing fuel oil burners are currently located.
- AFUDC is allowable. The threshold for AFUDC at the time of the estimate is \$66.5M.
- Excludes any fan work (FD Fans only - not balanced draft).
- Excludes the remediation and disposal of hazardous waste such as contaminated soil.
- Includes disposal of the demolished pipe in a hazardous materials landfill.
- The Plant will remove all #6 Fuel Oil Alarms and Light Oil Alarms from the DCS. They will de-terminate the #6 Fuel Oil field points and Light Oil field points no longer used in the Bailey Panel as well. The labor for this is included in the PGN Staffing Plan.

Total Project Estimate Summary

	Total Value	
EPC Contractor		
EPC Contractor Direct & Indirect Cost	\$ 21,426,457	30%
EPC Contractor Contingency	\$ 1,714,117	2%
EPC Contractor Escalation	\$ 1,217,091	2%
EPC Contractor OH&P	\$ 3,653,650	5%
TOTAL EPC CONTRACT	\$ 28,011,314	39%
Owners Costs		
Progress Energy Direct & Indirect Cost	\$ 36,481,943	50%
Progress Energy Contingency	\$ 5,751,322	8%
Progress Energy Escalation	\$ 1,232,614	2%
TOTAL OWNER COST	\$ 43,465,879	60%
Total Project Costs	\$ 71,477,193	99%
Total Fin View - 55% PGN Labor	\$ 72,304,542	100%

EPC Cost

Description	Qty's	U / M	Avg MH / UM	PF	Total MH's	Labor \$'s	\$/UM	Material / Expense \$'s	Subcontract \$'s	Total \$'s Cost	% of Project Cost
Division 0 - Demo / Civil / Sitework											
Excavation/ backfill for Fuel Gas Line	1,600	CY	0.4	1.0	640	\$ 32,828	\$ -	\$ -	\$ -	\$ 32,828	0.0%
Demo/ Remove Existing Light Oil Igniters - U2	8	EA	20.0	1.0	160	\$ 8,207	\$ -	\$ -	\$ -	\$ 8,207	0.0%
Demo/ Remove Existing Light Oil Igniters - U1	8	EA	20.0	1.0	160	\$ 8,207	\$ -	\$ -	\$ -	\$ 8,207	0.0%
Existing Fuel Oil Piping - Unit 2		LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Flush Fuel Oil from Pipe	1,423	LF	1.0	1.0	1,423	\$ 72,991	\$ 25	\$ 35,575	\$ -	\$ 108,566	0.2%
Saw Cut Pipe - 8" CS Sch 40	3	EA	0.76	1.0	2	\$ 117	\$ -	\$ -	\$ -	\$ 117	0.0%
Saw Cut Pipe - 6" CS Sch 40	9	EA	0.60	1.0	5	\$ 277	\$ -	\$ -	\$ -	\$ 277	0.0%
Saw Cut Pipe - 4" CS Sch 40	30	EA	0.43	1.0	13	\$ 662	\$ -	\$ -	\$ -	\$ 662	0.0%
Saw Cut Pipe - 2.5" CS Sch 40	90	EA	0.30	1.0	27	\$ 1,385	\$ -	\$ -	\$ -	\$ 1,385	0.0%
Saw Cut Pipe - 1.5" CS Sch 40	60	EA	0.25	1.0	15	\$ 769	\$ -	\$ -	\$ -	\$ 769	0.0%
Remove Pipe & Dispose - 8" CS Sch 40	42	LF	0.70	0.5	15	\$ 754	\$ 50	\$ 2,100	\$ -	\$ 2,854	0.0%
Remove Pipe & Dispose - 6" CS Sch 40	97	LF	0.60	0.5	29	\$ 1,493	\$ 50	\$ 4,850	\$ -	\$ 6,343	0.0%
Remove Pipe & Dispose - 4" CS Sch 40	409	LF	0.50	0.5	102	\$ 5,245	\$ 50	\$ 20,450	\$ -	\$ 25,695	0.0%
Remove Pipe & Dispose - 2.5" CS Sch 40	595	LF	0.35	0.5	104	\$ 5,341	\$ 50	\$ 29,750	\$ -	\$ 35,091	0.0%
Remove Pipe & Dispose - 1.5" CS Sch 40	280	LF	0.30	0.5	42	\$ 2,154	\$ 50	\$ 14,000	\$ -	\$ 16,154	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS BG - Excavate/ backfill - AIP	-	CY	0.5	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS BG - Saw Cut & Cap - AIP	4	EA	0.8	1.0	3	\$ 156	\$ -	\$ -	\$ -	\$ 156	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS BG - Remove & Dispose	720	LF	0.7	0.5	252	\$ 12,926	\$ 50	\$ 36,000	\$ -	\$ 48,926	0.1%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS AG Elev 0 -Elev 95 - Saw Cut	10	EA	0.8	1.0	8	\$ 410	\$ -	\$ -	\$ -	\$ 410	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS AG Elev 0 -Elev 95 - Remove & Dispose	95	LF	0.7	0.5	33	\$ 1,706	\$ 50	\$ 4,750	\$ -	\$ 6,456	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS BG - Excavate/ backfill	100	CY	0.5	1.0	45	\$ 2,308	\$ -	\$ -	\$ -	\$ 2,308	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS BG - Saw Cut	57	EA	0.8	1.0	43	\$ 2,222	\$ -	\$ -	\$ -	\$ 2,222	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS BG - Remove & Dispose	570	LF	0.7	0.5	200	\$ 10,233	\$ 50	\$ 28,500	\$ -	\$ 38,733	0.1%
Fuel Oil Return Line - Booster house to Boiler - 8" CS AG Elev 0 -Elev 95 - Saw Cut	10	EA	0.8	1.0	8	\$ 410	\$ -	\$ -	\$ -	\$ 410	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS AG Elev 0 -Elev 95 - Remove & Dispose	95	LF	0.7	0.5	33	\$ 1,706	\$ 50	\$ 4,750	\$ -	\$ 6,456	0.0%
Electrical Heat Trace and Insulation Removal/ Disposal Lead & Asbestos Abatement	5,624	LF	0.2	1.0	1,125	\$ 57,693	\$ -	\$ -	\$ -	\$ 57,693	0.1%
Fuel Oil Burners & Igniters Removal (5 levels, 4 burners & Igniters/ Level)	40	EA	80.0	1.0	3,200	\$ 164,139	\$ -	\$ -	\$ -	\$ 164,139	0.2%
Existing Fuel Oil Piping - Unit 1		LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Flush Fuel Oil from Pipe	1,423	LF	1.0	1.0	1,423	\$ 72,991	\$ 25	\$ 35,575	\$ -	\$ 108,566	0.2%
Saw Cut Pipe - 8" CS Sch 40	3	EA	0.76	1.0	2	\$ 117	\$ -	\$ -	\$ -	\$ 117	0.0%
Saw Cut Pipe - 6" CS Sch 40	9	EA	0.60	1.0	5	\$ 277	\$ -	\$ -	\$ -	\$ 277	0.0%
Saw Cut Pipe - 4" CS Sch 40	30	EA	0.43	1.0	13	\$ 662	\$ -	\$ -	\$ -	\$ 662	0.0%
Saw Cut Pipe - 2.5" CS Sch 40	90	EA	0.30	1.0	27	\$ 1,385	\$ -	\$ -	\$ -	\$ 1,385	0.0%
Saw Cut Pipe - 1.5" CS Sch 40	60	EA	0.25	1.0	15	\$ 769	\$ -	\$ -	\$ -	\$ 769	0.0%
Remove Pipe & Dispose - 8" CS Sch 40	42	LF	0.70	0.5	15	\$ 754	\$ 50	\$ 2,100	\$ -	\$ 2,854	0.0%
Remove Pipe & Dispose - 6" CS Sch 40	97	LF	0.60	0.5	29	\$ 1,493	\$ 50	\$ 4,850	\$ -	\$ 6,343	0.0%
Remove Pipe & Dispose - 4" CS Sch 40	409	LF	0.50	0.5	102	\$ 5,245	\$ 50	\$ 20,450	\$ -	\$ 25,695	0.0%
Remove Pipe & Dispose - 2.5" CS Sch 40	595	LF	0.35	0.5	104	\$ 5,341	\$ 50	\$ 29,750	\$ -	\$ 35,091	0.0%
Remove Pipe & Dispose - 1.5" CS Sch 40	280	LF	0.30	0.5	42	\$ 2,154	\$ 50	\$ 14,000	\$ -	\$ 16,154	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS BG - Excavate/ backfill - AIP	-	CY	0.5	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS BG - Saw Cut & Cap - AIP	4	EA	0.8	1.0	3	\$ 156	\$ -	\$ -	\$ -	\$ 156	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS BG - Remove & Dispose	570	LF	0.7	0.5	200	\$ 10,233	\$ 50	\$ 28,500	\$ -	\$ 38,733	0.1%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS AG Elev 0 -Elev 95 - Saw Cut	10	EA	0.8	1.0	8	\$ 410	\$ -	\$ -	\$ -	\$ 410	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS AG Elev 0 -Elev 95 - Remove & Dispose	95	LF	0.7	0.5	33	\$ 1,706	\$ 50	\$ 4,750	\$ -	\$ 6,456	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS BG - Excavate/ backfill	100	CY	0.5	1.0	45	\$ 2,308	\$ -	\$ -	\$ -	\$ 2,308	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS BG - Saw Cut	57	EA	0.8	1.0	43	\$ 2,222	\$ -	\$ -	\$ -	\$ 2,222	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS BG - Remove & Dispose	570	LF	0.7	0.5	200	\$ 10,233	\$ 50	\$ 28,500	\$ -	\$ 38,733	0.1%
Fuel Oil Return Line - Booster house to Boiler - 8" CS AG Elev 0 -Elev 95 - Saw Cut	10	EA	0.8	1.0	8	\$ 410	\$ -	\$ -	\$ -	\$ 410	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS AG Elev 0 -Elev 95 - Remove & Dispose	95	LF	0.7	0.5	33	\$ 1,706	\$ 50	\$ 4,750	\$ -	\$ 6,456	0.0%

CONFIDENTIAL

Description	Qty's	U / M	Avg MH / UM	PF	Total MH's	Labor \$'s	\$/UM	Material / Expense \$'s	Subcontract \$'s	Total \$'s Cost	% of Project Cost
Electrical Heat Trace and Insulation Removal/ Disposal	5,429	LS	0.2	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Lead & Asbestos Abatement	1	EA	1.0	1.0	1,086	\$ 55,692	\$ -	\$ -	\$ -	\$ 55,692	0.1%
	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ 125,000	\$ 125,000	0.2%
Fuel Oil Burners & Ignitors Removal (5 levels, 4 burners & Ignitors/ Level)	40	EA	80.0	1.0	3,200	\$ 164,139	\$ -	\$ -	\$ -	\$ 164,139	0.2%
	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Total: Division 0- Demo / Civil / Sitework	-	CY	-	-	14,324	\$ 734,740	\$ -	\$ 353,950	\$ 250,000	\$ 1,338,690	2%
Division 1- Concrete											
Pipe Footers, Heat Exchanger Pad	1.0	LS	250.0	1.0	250	\$ 12,823	\$ 2,500	\$ 2,500	\$ -	\$ 15,323	0.0%
	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Total: Division 1- Concrete	-	CY	-	-	250	\$ 12,823	\$ -	\$ 2,500	\$ -	\$ 15,323	0%
Division 2- Structural Steel / Buildings / Arch & Metals											
Misc Supports and Platform Mods	10	LS	25.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
	-	TNS	1.2	1.2	300	\$ 15,388	\$ 3,200	\$ 32,000	\$ -	\$ 47,388	0.1%
	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Unit 2	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Repair Boiler Penetrations for Removed FO Burners and Ignitors	40	EA	20.0	1.0	800	\$ 41,035	\$ 1,000	\$ 40,000	\$ -	\$ 81,035	0.1%
	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Unit 1	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Repair Boiler Penetrations for Removed FO Burners and Ignitors	40	EA	20.0	1.0	800	\$ 41,035	\$ 1,000	\$ 40,000	\$ -	\$ 81,035	0.1%
	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Total: Division 2- Structural Steel / Buildings / Arch & Metals	10	TNS	190.0	-	1,900	\$ 97,458	\$ -	\$ 112,000	\$ -	\$ 209,458	0%
Division 3- Piping											
Unit 2											
Isolate and purge 8" Gas Line	1	LS	50.00	1.20	60	\$ 3,078	\$ -	\$ -	\$ -	\$ 3,078	0.0%
Cut 8" Header and install 8"X8"X6" Reducing Tee	4	EA	10.00	1.20	48	\$ 2,462	\$ 110.00	\$ 440	\$ -	\$ 2,902	0.0%
6" CS pipe - 90deg elbows	4	EA	6.00	1.20	29	\$ 1,477	\$ 110.00	\$ 440	\$ -	\$ 1,917	0.0%
6" CS pipe -	12	LF	4.00	1.20	58	\$ 2,955	\$ 65.00	\$ 780	\$ -	\$ 3,735	0.0%
6" Isolation Valve	4	EA	20.00	1.20	96	\$ 4,924	\$ 9,000.00	\$ 36,000	\$ -	\$ 40,924	0.1%
	-	LS	1.20	1.20	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
12" pipe sch 80, carbon steel	450	LF	6.00	1.20	3,240	\$ 166,191	\$ -	\$ -	\$ -	\$ 166,191	0.2%
6" pipe sch 80, carbon steel	450	LF	4.00	1.20	2,160	\$ 110,794	\$ -	\$ -	\$ -	\$ 110,794	0.2%
2 1/2" pipe sch 80, carbon steel (vent pipe)	900	LF	2.00	1.20	2,160	\$ 110,794	\$ -	\$ -	\$ -	\$ 110,794	0.2%
Pipe Supports	225	EA	5.00	1.20	1,350	\$ 69,246	\$ 225.00	\$ 50,625	\$ -	\$ 119,871	0.2%
Cut 4" header and install 2.5"X4"X4" Reducing Tee	12	EA	8.00	1.20	115	\$ 5,909	\$ 110.00	\$ 1,320	\$ -	\$ 7,229	0.0%
	-	LS	1.00	1.00	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Corner Valves 2 per corner	24	EA	16.00	1.20	461	\$ 23,636	\$ -	\$ -	\$ -	\$ 23,636	0.0%
Corner Bleed 1 per corner	12	EA	8.00	1.20	115	\$ 5,909	\$ -	\$ -	\$ -	\$ 5,909	0.0%
Corner manual isolation valve	12	EA	16.00	1.20	230	\$ 11,818	\$ -	\$ -	\$ -	\$ 11,818	0.0%
Header manual isolation valve	2	EA	24.00	1.20	58	\$ 2,955	\$ -	\$ -	\$ -	\$ 2,955	0.0%
Header Gas Control Valve	1	EA	20.00	1.20	24	\$ 1,231	\$ -	\$ -	\$ -	\$ 1,231	0.0%
Isolation Trip Valve Gas Header	1	EA	20.00	1.20	24	\$ 1,231	\$ -	\$ -	\$ -	\$ 1,231	0.0%
Miscellaneous Valves	36	EA	16.00	1.20	691	\$ 35,454	\$ -	\$ -	\$ -	\$ 35,454	0.0%
	-	LS	1.20	1.20	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Unit 1											
Isolate and purge 8" Gas Line	1	LS	50.00	1.20	60	\$ 3,078	\$ -	\$ -	\$ -	\$ 3,078	0.0%
Cut 8" Header and install 8"X8"X6" Reducing Tee	4	EA	10.00	1.20	48	\$ 2,462	\$ 110.00	\$ 440	\$ -	\$ 2,902	0.0%
6" CS pipe - 90deg elbows	4	EA	6.00	1.20	29	\$ 1,477	\$ 110.00	\$ 440	\$ -	\$ 1,917	0.0%
6" CS pipe -	12	LF	4.00	1.20	58	\$ 2,955	\$ 65.00	\$ 780	\$ -	\$ 3,735	0.0%
6" Isolation Valve	4	EA	20.00	1.20	96	\$ 4,924	\$ 9,000.00	\$ 36,000	\$ -	\$ 40,924	0.1%
	-	LS	1.20	1.20	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
12" pipe sch 80, carbon steel	450	LF	6.00	1.20	3,240	\$ 166,191	\$ -	\$ -	\$ -	\$ 166,191	0.2%
6" pipe sch 80, carbon steel	450	LF	4.00	1.20	2,160	\$ 110,794	\$ -	\$ -	\$ -	\$ 110,794	0.2%
2 1/2" pipe sch 80, carbon steel (vent pipe)	900	LF	2.00	1.20	2,160	\$ 110,794	\$ -	\$ -	\$ -	\$ 110,794	0.2%
Pipe Supports	225	EA	5.00	1.20	1,350	\$ 69,246	\$ 225.00	\$ 50,625	\$ -	\$ 119,871	0.2%
Cut 4" header and install 2.5"X4"X4" Reducing Tee	12	EA	8.00	1.20	115	\$ 5,909	\$ 110.00	\$ 1,320	\$ -	\$ 7,229	0.0%
	-	LS	1.00	1.00	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Corner Valves 2 per corner	24	EA	16.00	1.20	461	\$ 23,636	\$ -	\$ -	\$ -	\$ 23,636	0.0%
Corner Bleed 1 per corner	12	EA	8.00	1.20	115	\$ 5,909	\$ -	\$ -	\$ -	\$ 5,909	0.0%
Corner manual isolation valve	12	EA	16.00	1.20	230	\$ 11,818	\$ -	\$ -	\$ -	\$ 11,818	0.0%
Header manual isolation valve	2	EA	24.00	1.20	58	\$ 2,955	\$ -	\$ -	\$ -	\$ 2,955	0.0%
Header Gas Control Valve	1	EA	20.00	1.20	24	\$ 1,231	\$ -	\$ -	\$ -	\$ 1,231	0.0%
Isolation Trip Valve Gas Header	1	EA	20.00	1.20	24	\$ 1,231	\$ -	\$ -	\$ -	\$ 1,231	0.0%
Miscellaneous Valves	36	EA	16.00	1.20	691	\$ 35,454	\$ -	\$ -	\$ -	\$ 35,454	0.0%
	-	LS	1.20	1.20	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Common - Gas Line from M&R Station to Units											
From M&R to the unit - 24" BG, CS											
Reducing Tee 24" to 12"											
4" CS AG - Steam pipe for FG Heat Exchangers											
		LS	1.00	1.00	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		LS	1.00	1.00	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		LS	1.00	1.00	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		LS	1.00	1.00	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		LF	1.00	1.00	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Total: Division 3- Piping	5,424	LF	5.20	1.00	28,226	\$ 1,447,891	\$ -	\$ 447,800	\$ -	\$ 1,895,691	3%

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Description	Qty's	U / M	Avg MH / UM	PF	Total MH's	Labor \$'s	\$/UM	Material / Expense \$'s	Subcontract \$'s	Total \$'s Cost	% of Project Cost
Division 4- Equipment											
Unit 2											
Flame Scanners	20	LS	-	1.0	96	\$ 4,924	\$ 10,000.00	\$ 200,000	\$ -	\$ 204,924	0.3%
Gas Igniters - replace current diesel igniters with gas	20	EA	80.0	1.20	1,920	\$ 98,483	\$ -	\$ -	\$ -	\$ 98,483	0.1%
Burner Installation - Supplied by Owner	12	EA	200.00	1.20	2,880	\$ 147,725	\$ -	\$ -	\$ -	\$ 147,725	0.2%
		LS		1.20	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
LTSH and SH Horizontal Section Replacement (Labor is factored from the equipment price)	1	LS	50,000.0	1.0	50,000	\$ 2,564,672	\$ -	\$ -	\$ -	\$ 2,564,672	3.5%
Lower SH Header Replacement	1	LS	20,000.0	1.0	20,000	\$ 1,025,869	\$ 150,000	\$ 150,000	\$ -	\$ 1,175,869	1.6%
				1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Cost for Boiler repairs as found through the assessment - See Risk Register	-	LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
				1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		EA		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Unit 1											
Flame Scanners	20	EA	4.00	1.20	96	\$ 4,924	\$ 10,000.00	\$ 200,000	\$ -	\$ 204,924	0.3%
Gas Igniters - replace current diesel igniters with gas	20	EA	80.0	1.20	1,920	\$ 98,483	\$ -	\$ -	\$ -	\$ 98,483	0.1%
Burner Installation - Supplied by Owner	12	EA	200.00	1.20	2,880	\$ 147,725	\$ -	\$ -	\$ -	\$ 147,725	0.2%
		LS		1.20	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
LTSH and SH Horizontal Section Replacement (Labor is factored from the equipment price)	1	LS	50,000.0	1.0	50,000	\$ 2,564,672	\$ -	\$ -	\$ -	\$ 2,564,672	3.5%
Lower SH Header Replacement	1	LS	20,000.0	1.0	20,000	\$ 1,025,869	\$ 150,000	\$ 150,000	\$ -	\$ 1,175,869	1.6%
				1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Cost for Boiler repairs as found through the assessment - See Risk Register	-	LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
				1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Common											
Fire Protection Modifications	1	LS		1.0	-	\$ -	\$ -	\$ -	\$ 250,000	\$ 250,000	0.3%
Cathodic Protection	1	LS		1.0	-	\$ -	\$ -	\$ -	\$ 25,000	\$ 25,000	0.0%
Fuel Gas Heat Exchanger	1	EA	125.0	1.0	125	\$ 6,412	\$ 150,000	\$ 150,000	\$ -	\$ 156,412	0.2%
		EA		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Total: Division 4- Equipment	1	LS	148,917.0	1.0	149,917	\$ 7,689,756	\$ -	\$ 850,000	\$ 275,000.00	\$ 8,814,759	12%
Division 5- Electrical											
Unit 2											
Control Wire inclds terminations	10,000	LF	0.03	1.20	360	\$ 18,466	\$ 3.00	\$ 30,000	\$ -	\$ 48,466	0.1%
Power cable inclds terminations	1,500	LF	0.04	1.20	72	\$ 3,693	\$ 5.00	\$ 7,500	\$ -	\$ 11,193	0.0%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Cable Tray - 12", ladder bottom, no covers	500	LF	1.50	1.20	900	\$ 46,164	\$ 45.00	\$ 22,500	\$ -	\$ 68,664	0.1%
Conduit - AG, 2"	5,000	LF	0.42	1.20	2,520	\$ 129,259	\$ 11.00	\$ 55,000	\$ -	\$ 184,259	0.3%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Unit 1											
Control Wire inclds terminations	10,000	LF	0.03	1.20	360	\$ 18,466	\$ 3.00	\$ 30,000	\$ -	\$ 48,466	0.1%
Power cable inclds terminations	1,500	LF	0.04	1.20	72	\$ 3,693	\$ 5.00	\$ 7,500	\$ -	\$ 11,193	0.0%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Cable Tray - 12", ladder bottom, no covers	500	LF	1.50	1.20	900	\$ 46,164	\$ 45.00	\$ 22,500	\$ -	\$ 68,664	0.1%
Conduit - AG, 2"	5,000	LF	0.42	1.20	2,520	\$ 129,259	\$ 11.00	\$ 55,000	\$ -	\$ 184,259	0.3%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Total: Division 5- Electrical	23,000	LF	0.33	1.0	7,704	\$ 395,165	\$ -	\$ 230,000	\$ -	\$ 625,165	1%
Division 6- Instrumentation / Controls											
Unit 2											
Header Flow Transmitter FT	1	EA	4.00	1.20	5	\$ 246	\$ -	\$ -	\$ -	\$ 246	0.0%
Pressure Transmitter (PT)	6	EA	4.00	1.20	29	\$ 1,477	\$ -	\$ -	\$ -	\$ 1,477	0.0%
Temperature Transmitter (TT)	3	EA	4.00	1.20	14	\$ 739	\$ -	\$ -	\$ -	\$ 739	0.0%
Pressure Indicator (PI)	6	EA	3.00	1.20	22	\$ 1,108	\$ -	\$ -	\$ -	\$ 1,108	0.0%
Pressure Switch High, PSH use PT	6	EA	4.00	1.20	29	\$ 1,477	\$ -	\$ -	\$ -	\$ 1,477	0.0%
Pressure Switch Low, PSL use PT	3	EA	4.00	1.20	14	\$ 739	\$ -	\$ -	\$ -	\$ 739	0.0%
Air Regulators for on-off valves	15	EA	3.00	1.20	54	\$ 2,770	\$ -	\$ -	\$ -	\$ 2,770	0.0%
Upstream Windbox Pressure Sensors	8	EA	6.00	1.20	58	\$ 2,955	\$ 4,500.00	\$ 36,000	\$ -	\$ 38,955	0.1%
Airflow Measurement System - Supplied by AMC (44 windbox, 2 CAMM in NEMA 4 enc.) - Downstream Sensors	1	LS	320.00	1.20	384	\$ 19,697	\$ 750.00	\$ 750	\$ -	\$ 20,447	0.0%
3/8" SS Tubing (incl fittings)	4,000	LF	0.15	1.20	720	\$ 36,931	\$ 2.16	\$ 8,640	\$ -	\$ 45,571	0.0%
I/O Cabinets	1	EA	4,000.00	1.20	4,800	\$ 246,209	\$ 90,000.00	\$ 90,000	\$ -	\$ 336,209	0.5%
Communications Equipment	1	LS	4,000.00	1.20	4,800	\$ 246,209	\$ 20,000.00	\$ 20,000	\$ -	\$ 266,209	0.4%
											0.0%
Unit 1											
Header Flow Transmitter FT	1	EA	4.00	1.20	5	\$ 246	\$ -	\$ -	\$ -	\$ 246	0.0%
Pressure Transmitter (PT)	6	EA	4.00	1.20	29	\$ 1,477	\$ -	\$ -	\$ -	\$ 1,477	0.0%
Temperature Transmitter (TT)	3	EA	4.00	1.20	14	\$ 739	\$ -	\$ -	\$ -	\$ 739	0.0%
Pressure Indicator (PI)	6	EA	3.00	1.20	22	\$ 1,108	\$ -	\$ -	\$ -	\$ 1,108	0.0%
Pressure Switch High, PSH use PT	6	EA	4.00	1.20	29	\$ 1,477	\$ -	\$ -	\$ -	\$ 1,477	0.0%
Pressure Switch Low, PSL use PT	3	EA	4.00	1.20	14	\$ 739	\$ -	\$ -	\$ -	\$ 739	0.0%
Air Regulators for on-off valves	15	EA	3.00	1.20	54	\$ 2,770	\$ -	\$ -	\$ -	\$ 2,770	0.0%
Upstream Windbox Pressure Sensors	8	EA	6.00	1.20	58	\$ 2,955	\$ 4,500.00	\$ 36,000	\$ -	\$ 38,955	0.1%
Airflow Measurement System - Supplied by AMC (44 windbox, 2 CAMM in NEMA 4 enc.) - Downstream Sensors	1	LS	320.00	1.20	384	\$ 19,697	\$ 750.00	\$ 750	\$ -	\$ 20,447	0.0%
3/8" SS Tubing (incl fittings)	4,000	LF	0.15	1.20	720	\$ 36,931	\$ 2.16	\$ 8,640	\$ -	\$ 45,571	0.0%
I/O Cabinets	1	EA	4,000.00	1.20	4,800	\$ 246,209	\$ 90,000.00	\$ 90,000	\$ -	\$ 336,209	0.5%
Communications Equipment	1	LS	4,000.00	1.20	4,800	\$ 246,209	\$ 20,000.00	\$ 20,000	\$ -	\$ 266,209	0.4%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		EA		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		EA		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		EA		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Total: Division 6- Instrumentation / Controls	98	EA	223.03	1.0	21,857	\$ 1,121,110	\$ -	\$ 310,780	\$ -	\$ 1,431,890	2%

Description	Qty's	U / M	Avg MH / UM	PF	Total MH's	Labor \$'s	\$/UM	Material / Expense \$'s	Subcontract \$'s	Total \$'s Cost	% of Project Cost
Division 7- Insulation / Painting											
Insulation/ Painting Allowance	-	LS	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
	-	LS	-	1.0	-	\$ -		\$ -	\$ 175,000.00	\$ 175,000	0.2%
	-	SF	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
	-	LS	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
	-	SF	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
	-	LS	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
	-	LS	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
Total: Division 7- Insulation / Painting	-	LF	-	1.0	-	\$ -		\$ -	\$ 175,000	\$ 175,000	0%
CCO- (Contract Change Order Directs)											
	-	LS	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
Total: CCO- (Contract Change Order Directs)	-	LS	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0%
Total Construction Directs				1.0	224,180	\$ 11,498,945		\$ 2,307,030	\$ 700,000	\$ 14,505,975	20%
Division 8- Construction Indirects											
Safety	1	LS	1.00%	1.0	2,242	\$ 114,989	0.25%	\$ 36,265	\$ -	\$ 151,254	0.2%
Mobilization / Demobilization	1	LS	0.50%	1.0	1,121	\$ 57,495	0.50%	\$ 72,530	\$ -	\$ 130,025	0.2%
Office / Field Overhead Expenses	1	LS	0.00%	1.0	-	\$ -	0.20%	\$ 29,012	\$ -	\$ 29,012	0.0%
Site Services	1	LS	2.00%	1.0	4,484	\$ 229,979	2.00%	\$ 290,120	\$ -	\$ 520,098	0.7%
Additional Demob/ Remob	-	EA	0.00%	1.0	-	\$ -	-	\$ -	\$ -	\$ -	0.0%
Equipment - Scaffolding	1	LS	0.00%	1.0	-	\$ -	-	\$ -	\$ 450,000	\$ 450,000	0.6%
Equipment (\$ per Direct MH)	1	LS	0.10%	1.0	224	\$ 11,499	7.50	\$ 1,681,347	\$ -	\$ 1,692,846	2.3%
ST&C (\$ per Direct MH)	1	LS	0.00%	1.0	-	\$ -	3.50	\$ 784,629	\$ -	\$ 784,629	1.1%
Other (freight, rainout/ standby time)	1	LS	0.25%	1.0	560	\$ 28,747	0.10%	\$ 14,506	\$ -	\$ 43,253	0.1%
Pre-Op Startup & Testing	1	LS	0.50%	1.0	1,121	\$ 57,495	0.00%	\$ -	\$ -	\$ 57,495	0.1%
Other	-	LS	0.00%	1.0	-	\$ -	0.00%	\$ -	\$ -	\$ -	0.0%
Total: Division 8- Construction Indirects	1	LS	9,751.8	1.0	9,752	\$ 500,204		\$ 2,908,408	\$ 450,000	\$ 3,858,613	5%
Construction Management											
Staff Construction Management	1	LS	8.0	1.0	28,022	\$ 1,961,572	\$ 882,707	\$ 882,707	\$ -	\$ 2,844,279	3.9%
Craft CM	-	Mths	-	1.0	-	\$ -	-	\$ -	\$ -	\$ -	0.0%
Total: Construction Management	1	LS	8.0	1.0	28,022	\$ 1,961,572		\$ 882,707	\$ -	\$ 2,844,279	4%
Total Construction Cost	1	LS	9,759.8	1.0	261,954	\$ 13,960,721		\$ 6,098,146	\$ 1,150,000	\$ 21,208,867	26%
Division 9- Home Office Engineering / Indirects											
Engineering / Admin	-	LS	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
Insurance / Sureties	1	LS	-	1.0	-	\$ -	0.50%	\$ 72,530	\$ -	\$ 72,530	0.1%
Permits / Taxes / Warranty / Other	1	LS	-	1.0	-	\$ -	1.00%	\$ 145,060	\$ -	\$ 145,060	0.2%
Total: Division 9- Home Office Engineering/Indirects	1	LS	-	1.0	-	\$ -		\$ 217,590	\$ -	\$ 217,590	0%
Total Direct & Indirect Cost (Excluding Cont & Esc)	1	LS	261,953.9	1.0	261,954	\$ 13,960,721		\$ 6,315,735	\$ 1,150,000	\$ 21,426,457	30%
Contingency & Escalation											
Contingency	8%	PCT	261,953.9	1.0	20,956	\$ 1,116,858		\$ 505,259	\$ 92,000	\$ 1,714,117	2.4%
Escalation	5%	PCT	-	1.0	-	\$ -		\$ -	\$ 1,217,091	\$ 1,217,091	1.7%
Total Contingency & Escalation					20,956	\$ 1,116,858		\$ 505,259	\$ 1,309,091	\$ 2,931,207	4%
Total EPC Cost					282,910	\$ 15,077,579		\$ 6,820,994	\$ 2,459,091	\$ 24,357,664	34%
Contractor OH & P											
Contractor G&A	5.0%	PCT	-	-	-	\$ 753,878.96		\$ 341,049.71	\$ 122,954.55	\$ 1,217,883	1.7%
Contractor Fee	10.0%	PCT	-	-	-	\$ 1,507,757.92		\$ 682,099.42	\$ 245,909.09	\$ 2,435,766	3.4%
Total OH & P						\$ 2,261,637		\$ 1,023,149	\$ 368,864	\$ 3,653,650	
Total EPC Contractor Contract Value										\$ 28,011,314	38%

CONFIDENTIAL

Description	Qty's	U / M	Avg MH / UM	PF	Total MH's	Labor \$'s	\$/UM	Material / Expense \$'s	Subcontract \$'s	Total \$'s Cost	% of Project Cost	
Progress Energy Detail												
Owner Procurements												
Unit 2											0.0%	
Gas Burner Assembly (Based on Alstom Budgetary Quote)	3	EA	-	-	-	\$	-	\$ 555,000	\$ 1,665,000	\$ -	\$ 1,665,000	2.3%
Optional Costs Commissioning/Support	3	EA	-	-	-	\$	-	\$ 46,500	\$ 139,501	\$ -	\$ 139,501	0.2%
Freight	1	LS	-	-	-	\$	-	\$ 9,000.00	\$ 9,000	\$ -	\$ 9,000	0.0%
Airflow Measurement System	1	EA	-	-	-	\$	-	\$ 235,400.00	\$ 235,400	\$ -	\$ 235,400	0.3%
Freight	1	EA	-	-	-	\$	-	\$ 4,000.00	\$ 4,000	\$ -	\$ 4,000	0.0%
Gas Igniters - 20 Ea, Inclds Horn Igniter, Hose, Block & Vent Valve Train, Control box	1	LS	-	-	-	\$	-	\$ 474,670	\$ 474,670	\$ -	\$ 474,670	0.7%
						\$	\$	-	\$ -	\$ -	\$ -	0.0%
LTSH and SH Horizontal Section Materials - Alstom Budgetary quote escalated at 2.4% and 3.1%	1	LS	-	-	-	\$	-	\$ 5,701,018	\$ 5,701,018	\$ -	\$ 5,701,018	7.9%
Additional Superheater Work	1	LS	-	-	-	\$	-	\$ 1,000,000	\$ 1,000,000	\$ -	\$ 1,000,000	1.4%
Boiler Work - NFPA 85 Code Requirements	1	LS	-	-	-	\$	-	\$ 1,000,000	\$ 1,000,000	\$ -	\$ 1,000,000	1.4%
						\$	\$	-	\$ -	\$ -	\$ -	0.0%
Unit 1											0.0%	
Gas Burner Assembly (Based on Alstom Budgetary Quote)	3	EA	-	-	-	\$	-	\$ 555,000	\$ 1,665,000	\$ -	\$ 1,665,000	2.3%
Optional Costs Commissioning/Support	3	EA	-	-	-	\$	-	\$ 46,500	\$ 139,501	\$ -	\$ 139,501	0.2%
Freight	1	LS	-	-	-	\$	-	\$ 9,000.00	\$ 9,000	\$ -	\$ 9,000	0.0%
Airflow Measurement System	1	EA	-	-	-	\$	-	\$ 235,400.00	\$ 235,400	\$ -	\$ 235,400	0.3%
Freight	1	EA	-	-	-	\$	-	\$ 4,000.00	\$ 4,000	\$ -	\$ 4,000	0.0%
Gas Igniters - 20 Ea, Inclds Horn Igniter, Hose, Block & Vent Valve Train, Control box	1	LS	-	-	-	\$	-	\$ 474,670	\$ 474,670	\$ -	\$ 474,670	0.7%
						\$	\$	-	\$ -	\$ -	\$ -	0.0%
LTSH and SH Horizontal Section Materials - Alstom Budgetary quote escalated at 2.4% and 3.1%	1	LS	-	-	-	\$	-	\$ 5,701,018	\$ 5,701,018	\$ -	\$ 5,701,018	7.9%
Additional Superheater Work	1	LS	-	-	-	\$	-	\$ 1,000,000	\$ 1,000,000	\$ -	\$ 1,000,000	1.4%
Boiler Work - NFPA 85 Code Requirements	1	LS	-	-	-	\$	-	\$ 1,000,000	\$ 1,000,000	\$ -	\$ 1,000,000	1.4%
						\$	\$	-	\$ -	\$ -	\$ -	0.0%
	1	LS	-	-	-	\$	-	\$ -	\$ -	\$ -	\$ -	
Total Owner Procurements												
						\$	-	\$ 20,457,176	\$ 11,300,000	\$ 31,757,176	43.9%	
Owner Labor & Indirect Cost												
Staff	1.00	LS	33,827		33,827	\$ 1,969,223		\$ 263,725	\$ -	\$ 2,232,948	3.1%	
Indirect	20.00%	PCT	-		-	\$ -	\$ 2,232,948	\$ 446,590	\$ -	\$ 446,590	0.6%	
BMS Review	1.00	LS	-		-	\$ -	\$ -	\$ -	\$ 50,000	\$ 50,000	0.1%	
DCS Engineering - Logic & Drawing Updates	1.00	LS	-		-	\$ -	\$ -	\$ -	\$ 300,000	\$ 300,000	0.4%	
Owner's Engineering for EPC Contract RFQ through Award	1.00	LS	-		-	\$ -	\$ 125,000	\$ 125,000	\$ -	\$ 125,000	0.2%	
Detail Design Engineering	1.00	LS	-		-	\$ -	\$ 1,000,000	\$ 1,000,000	\$ -	\$ 1,000,000	1.4%	
Boiler Assessment (per unit)	2.00	EA	-		-	\$ -	\$ -	\$ -	\$ 400,000	\$ 400,000	0.6%	
Insurance - BAR	0.31%	PCT	-		-	\$ -	\$ 12,976,962	\$ 40,229	\$ -	\$ 40,229	0.1%	
Startup Materials						\$ -	\$ -	\$ -	\$ -	\$ -	0.0%	
STG Startup Screens - Main Stop Valve U1	1.00	EA	-		-	\$ -	\$ 40,000	\$ 40,000	\$ -	\$ 40,000	0.1%	
STG Startup Screens - Main Stop Valve U2	1.00	EA	-		-	\$ -	\$ 40,000	\$ 40,000	\$ -	\$ 40,000	0.1%	
Compressors to Clean Gas Line	1.00	EA	-		-	\$ -	\$ 50,000	\$ 50,000	\$ -	\$ 50,000	0.1%	
	-	EA	-		-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%	
Total Owner Labor & Indirects												
					33,827	\$ 1,969,223		\$ 2,005,543	\$ 790,000	\$ 4,724,767	6.5%	
Owner Contingency & Escalation												
Procurement Contingency	10.0%	PCT	-		-	\$ -	\$ 31,757,176	\$ 3,175,718	\$ -	\$ 3,175,718	4.4%	
Labor & Indirect Cost Contingency	5.0%	PCT	1,691		1,691	\$ 98,461	\$ 4,724,767	\$ 236,238	\$ -	\$ 334,700	0.5%	
EPC Contract Contingency	8.0%	PCT	-		-	\$ -	\$ 28,011,314	\$ 2,240,905	\$ -	\$ 2,240,905	3.1%	
Risk Based Contingency - See Risk Register	-	LS	-		-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%	
Escalation	2.9%	PCT	-		-	\$ -	\$ -	\$ -	\$ 1,232,614	\$ 1,232,614	1.7%	
Total Contingency & Escalation												
					1,691	\$ 98,461		\$ 5,652,861	\$ 1,232,614	\$ 6,983,936	9.7%	
Total Owner Cost												
					35,518	\$ 2,067,685		\$ 26,115,581	\$ 13,282,614	\$ 43,465,879	60.1%	
Total Project Cost												
					318,428	\$ 19,406,901		\$ 35,959,724	\$ 16,110,568	\$ 71,477,193	95%	

Indicators	
Expt \$ / Direct MH:	\$9.56
Direct MH / CM MH's:	8.0
Direct MH / Indirect MH	23.0
Avg Eng Rt (Burdened)	\$0.00
Avg CM Rt (Burdened)	\$101.60
Craft "All-in Wage Rate"	\$116.28
Eng % of Proj Rev	0.0%
Peak FTE's	156
Avg FTE's	76
Avg Craft Work Week	50
Days per Week (Non Outg)	5
# Shifts (Non Outg)	1
# Shifts (Outg)	2
Blended Rate	\$29.17
Burden %:	30%
Per diem (\$ / WK)	\$625.00
Retention (\$ / MH)	\$2.00
Safety \$ / MH	\$0.00
Total Composite Rate	\$51.29

Estimated Cash Flow						
Year	2011	2012	2013	2014	2015	2016
Capital (Fin View)	\$280,094	\$35,908,832	\$34,568,769	\$1,526,848	\$0	\$0
AFUDC	\$728	\$1,090,305	\$3,669,351	\$0	\$0	\$0
Total	\$280,822	\$36,999,137	\$38,558,120	\$1,526,848	\$0	\$0

Project Validity Range					
Description	Estimate Range		100%		25%
	Min %	Max %	Min \$'s	Most Likely \$'s	Max \$'s
EPC Contract Costs	-25%	25%	\$ 21,008,486	\$ 28,011,314	\$ 35,014,143
Progress Energy Provided Procurement Costs	-25%	25%	\$ 23,817,882	\$ 31,757,176	\$ 39,696,471
Progress Energy Labor Costs	-15%	25%	\$ 1,898,006	\$ 2,232,948	\$ 2,791,196
Progress Energy Indirect Material Costs	-25%	30%	\$ 1,868,864	\$ 2,491,818	\$ 3,239,364
Total Project Cost Validity Range			\$ 48,593,238	\$ 64,493,257	\$ 80,741,162
Progress Energy Contingency				\$ 5,751,322	
Progress Energy Escalation				\$ 1,232,614	
Total			\$ 48,593,238	\$ 71,477,193	\$ 80,741,162
Total Fin View - 66% PGN Labor				\$ 72,304,542	

Cash Flow - Nominal Dollars (\$'000)	2.25%	2.25%	2.25%			
	2011	2012	2013	2014	Total	\$280,094
Anclore Gas Conversion - Modeled	280	35,909	36,116		72,305	
Anclore Gas Conversion - Original	280,094	35,908,832	34,588,769	1,526,848	72,304,543	68,200,501 4,104,042
Progress Energy Escalation					1,092,094	
Progress Energy Contingency					7,168,938	
AFUDC	728	964,638	3,641,501		4,606,867	
Strategist Input	280.094	35,118.662	34,543.664	-	69,942	
	0.40%	50.21%	49.39%	0.00%	100.00%	
Per Project	140.047	17,559.331	17,271.832	-	34,971	
		17,954,416	17,294,385	763,424		
		17,954	17,294	763	36,012	
		17,954	17,294	763	36,012	
		35,909	34,589	1,527	72,024	

PEF-120103-EI-00044

\$31,649,620 \$34,743,939 1,526,848

6.0%

PEF-120103-EI-00045

Anclore Conversion Project

Integrated Project Plan (IPP)

Financial Analysis Control Number: 2012-1621

Project Profile Ranking: Green III Project

The Anclore Conversion Project team plotted the project size and complexity using the PMCoE Project Profile Matrix Ranking Tool and determined that the Anclore Conversion Project ranks as a 'Green III Project'. Per procedure, the Anclore Conversion Project requires the assignment, at a minimum, of a Project Manager III (aka PM III). In addition, per procedure and at a minimum, the Anclore Conversion Project should comply with the Green requirements established within the PMCoE Enterprise Project Management Standards.

Please Note: This document contains confidential transmission information and is subject to Progress Energy's Standards of Conduct Procedure, #REG-SUBS-00002. Please do not distribute to Fuels & Power Optimization or Efficiency and Innovative Technology groups.

Sponsoring Business Unit:	Power Generation Florida
Funding Legal Entity:	PEF
Date Prepared:	01/20/2012

Key Project Contacts

Role, Department / Group	Name	Phone No.
Director, Project Development NGPPD	Andrew MacGregor	VNet:770-2427
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Plt Mgr-Anclore	Reginald Anderson	VNet:220-3006
Mgr-Resource Planning-TOP PEF	Benjamin Borsch	VNet:220-4565
Supv- Reg Planning Projects PEF	Geoff Foster	VNet:230-5247

Plan Revision Control

Rev No.	Primary Author(s)	Revision Description	Rev Date
0	Joel Moran & Candyce Marsh	Initial IPP	01/2012

Request for Approval

Purpose: ☒ Gate 0 - Initiate Project ☐ Gate 1 - Go Commit

☒ Gate 2 - Go Build / Baseline ☐ Revision

Authorization to make new commitments up to \$1.1 million *

Authorization to spend additional funds up to \$ 1.5 million *

Estimated total project cost \$ 52.8 million to \$ 87.5 million Expected Cost: \$77.4 (includes contingency)*

Next approval gate expected on: March 2012

Expected in-service date: June 2013 (Unit 1), December 2013 (Unit 2)

Notes or Exceptions:

* Full Financial View, including AFUDC, Net of Joint Owner

Approval Required

This IPP requires approval by the: Senior Management Committee

Approvals

The parties signing below indicate by their signature that they, or the body they represent below, have reviewed the IPP and either recommend approval of or approve the above Request for Approval.

Action	Name [Type / Print]	Reviewing Position	Signature	Date
Recommend Approval	Joel Moran	Project Manager, Mgr Proj Engring, NGPPD		
Recommend Approval	Kris Edmondson	Project Sponsor, Gen Mgr, Suncoast-PGF		
Recommend Approval	John Elnitsky	VP, NGPPD		
Recommend Approval	David Sorrick	VP, Power Generation-PEF		
Recommend Approval	Peter Toomey	VP, Finance, PEF		
Recommend Approval	Sasha Weintraub	VP, Fuels & Pwr Optimization		
Senior Management Committee Approval				
Approve		☐ Chief Executive Officer ☐ Chief Financial Officer ☐ General Counsel		
Approve	Jeff Lyash	Project Executive Sponsor		
Approve	Vinny Dolan	President & CEO PEF		

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1) Executive Summary -

Background-

On March 16, 2011, in compliance with a court-ordered deadline, the Environmental Protection Agency (EPA) released the proposed rule establishing Mercury and Air Toxics (MATS) standards for emissions of hazardous air pollutants (HAPs) from electric generating units (the “EGU MATS” or “Utility MATS”). On December 21, 2011, following the period for receipt and review of comments, the EPA released the final MATS rule which will be published in the Federal Register in January 2012. The rule imposes numerical limits on metals, including mercury and acid gas from oil and coal-fired power plants.

The Clean Air Act provides a 3-year time frame to comply with MATS standards. The permitting agency has the authority to add one year, and the President has the authority to add up to two additional years.

Proposed Project-

This project is to convert the existing Anclote Units 1 and 2 from their current use of #6 oil and natural gas to the exclusive use of natural gas in order to comply with the MATS standards. Two alternatives were considered in order to prepare the units for compliance. The first option is compliance through the use of emissions controls, specifically low NOx burners and an electrostatic precipitator (ESP). The second option is compliance through the conversion of the units to operation on natural gas as the single fuel. Conversion to natural gas provides the best overall economic benefit.

While compliance with the MATS standards is not required until first quarter of 2015, the proposed timing for the Anclote conversion will help mitigate any potential schedule delays due to permitting, construction, fuel gas supply etc. and should provide the additional benefit of fuel savings by switching from oil to the use of natural gas.

Of the risks identified in the Risk Register for the proposed project, the most significant are the extent of configuration changes to the existing boilers to support the switch to the exclusive use of natural gas and the suitability of the current balance of plant equipment to support the new design. To mitigate these risks, two separate engineering consultants reports have been commissioned and reviewed to determine the most likely boiler configuration changes and condition assessments are being prepared for each of the Unit 1 and 2 boilers. Review of the adequacy of existing balance of plant equipment will be part of the initial engineering work for the project.

The project cost is estimated to be between \$52.8 million and \$87.6 million (Class 5 estimate) with an expected cost of \$77.4million. In service dates for the converted units are June 2013 for Unit 1 and December 2013 for Unit 2.

Recommendation-

The project team requests senior management approval of \$1.5million for Phase 1 of the project which will consist of boiler configuration changes engineering to include thermal design, emissions estimates, control evaluation, detailed boiler condition assessment and analysis, demolition plan, planning for technical field advisor support, and owner’s engineering support.

2) Scope

Generation

The Anclote Generation Plant consists of two units that burn both Number 6 fuel oil and natural gas. The units currently have a maximum summer rating of 500MW and 510 MW for units 1 & 2, respectively. the current natural gas firing capability for each unit is limited to 40% of the total heat input. The balance of the heat input is from heavy fuel oil. The units as currently configured can operate on 100% heavy oil.

Preliminary studies indicate that the addition of three levels of fuel gas burners in combination with the existing natural gas burners will be required to provide full output on 100% natural gas. The option to co-fire natural gas and heavy fuel oil will no longer be possible once the planned conversion is completed.

The preliminary thermal analysis of the boiler for operation on 100% natural gas indicates that a portion of the lower horizontal superheater will need to be removed to limit heat absorption and manage superheater tube metal temperatures. In addition, the gas supply line M&R station will require an upgrade and relocation. Finally, the finishing horizontal super heater for each unit will require metallurgy upgrades to accommodate the peak temperatures resultant from the gas conversion. While the additional burners and the replacement superheater form the majority of the boiler work required, other areas of the boiler may require configuration changes to complete the conversion based on other boiler engineering analysis and condition assessment (e.g., convection pass baffle replacement). Final thermal design calculations, emissions estimates, and a condition assessment of each unit will determine the exact level of configuration changes needed to support the gas conversion and will be addressed in the initial phase of the OEM boiler scope of work.

The super heater section of each unit will require several configuration changes and recommendations from the preliminary studies performed to date have been incorporated into the estimate. This includes sections of the super heater that will need to be removed and other sections where material upgrades will be needed.

Other impacts to the boiler are not known at this time. The estimate includes costs to perform an assessment study. The risk assessment includes the potential project impact for boiler configuration changes that are found during the boiler assessment.

It is estimated that both Units will require a ten week outage to perform the installation. Unit 1 will be in the Spring of 2013 and Unit 2 will follow in the Fall of 2013. The estimate assumes that demobilization and a re-mobilization will occur between the outages.

Fuel

[REDACTED]

1
2
3
4
5

3) Key Milestones & Project Gates –

Below are key milestone deliverables and project gates.

Key Milestones & Project Gates				
Milestone	Date			Critical Path
	Baseline	Forecast	Actual	(y/n)
Gate 0- Initiate Project	January 2012	January 2012		Y
Boiler Engineering (Contracting Strategy Phase 1)	January 2012	January 2012		Y
Gate 1-Go Commit	March 2012	March 2012		Y
Sign Equipment Contracts (Contracting Strategy Phase 2)	March 2012	March 2012		Y
Sign Gas Contract	March 2012	March 2012		Y
Sign Construction Contract	November 2012	November 2012		Y
Gate 2- Go Build	March 2013	March 2013		Y
Mobilization Unit 1	March 2013	March 2013		Y
Mobilization Unit 2	September 2013	September 2013		Y
In-Service Date (Unit 1)	June 2013	June 2013		Y
In-Service Date (Unit 2)	December 2013	December 2013		Y

Note: Minor commitments at Gate 0, Initiate project, such as studies.

4) Estimated Project Cost

a) Project Cost History (for recurring IPP submissions)

Total Project Cost History – (\$ in Millions)			
IPP version/Date	Expected	Estimate Range	Estimate Class [AACEI]
Rev 0 01/2012	\$77.4	\$52.8-\$87.5	Class 5

See PJM-SUBS-00005 Project Cost & Financial Management for AACEI Estimate Class definition and guidance. For Class 3, 2, 1 estimate the Estimate Range should be noted as N/A.

Note the Anclote Conversion IPP rev 0 used a Class 5 estimate. Currently the project doesn't meet the definition of a Class 4 estimate as defined by the AACEI. The differential between Class 4 and Class 5 is based on the percentage of completed detailed design. At this time no detailed design has been completed.

b) Total Project Cost (Required only prior to establishing Baseline)

The cost estimate Class 5 per AACE's classification which is derived from the percent complete of design engineering (Typically 0-2%). The Low and High values for the Total Direct Cost & AFUDC represent a -25% and +25% range around the Expected case.

Total Project Cost (\$ Millions)			
Cost component	Low	Expected	High
Capital			
Gas Burner Assemblies			
Super Heater Parts			
M&R Station & Fuel Gas Supply Line			
Construction			
Owner's Cost			
Total Direct Costs	\$48.7	\$64.5	\$80.7
Burdens	\$0.7	\$0.8	\$1.0
Total Capex	\$49.4	\$65.3	\$81.7
AFUDC	\$3.4	\$5.1	\$5.8
Total Direct Cost & AFUDC	\$52.8	\$70.4	\$87.5
Contingency			
All-In Financial View, Net	\$52.8	\$77.4	\$87.5

Note: This project is not subject to joint ownership. Cost of Removal has been evaluated and determined to be immaterial at this time.

Capital Expenditures by Year (Net of joint owner)

CapEx	2012	2013	2014	Total
2012-2013 Budget	\$5.0	\$5.0	\$0	\$10.0
This IPP	\$35.9	34.6	\$1.5	72.3
Difference	(\$30.9)	(\$29.6)	(\$1.5)	(\$62.3)

c) AFUDC by Year

AFUDC	2012	2013	Total
2012-2013 Budget	\$0	\$0	\$0
This IPP	\$1.1	\$4.0	\$5.1
Difference	(\$1.1)	(\$4.0)	(\$5.1)

5) Post Implementation Incremental Operational Costs

With converting to full load gas on both Anclore units no organizational changes for Anclore are anticipated. As such, no significant non-fuel O&M expense changes are anticipated at this time.

6) Risk Assessment

The Enterprise Risk Management Framework (ERM-SUBS-00021) was followed to identify the standardized risk types for the project. The major risks for this project are summarized below.

a) Risk Matrix

Probability						
	Very High [90-100%]					
	High [66-89%]					
	Moderate [34-65%]	6, 7, 8, 9, 10.	1, 2, 3, 4, 5.			
	Low [11-33%]					
	Very Low [0-10%]					
		Minimal	Moderate	Significant	Severe	Critical
		<2%	<5%	<10%	<15%	>15%
		\$1.5m	\$3.5m	\$7.0m	\$10.5m	\$10.5m

					A	B	C
Risk ID	Risk Name	Total Cost Impact [\$M]	Probability of Occurrence	Total EMV [\$M]			
1	Existing Equipment not suitable for new design conditions. For example, Fans, Service Air						1
2	Boiler configuration changes - U2						2
3	Boiler configuration changes - U1						3
4	Super Heater Material Cost- U1						4
5	Super Heater Material Cost- U2						5
6	Potential Damage to the existing plant from construction activities						6
7	Unknown DCS compatibility						7
8	Procurement Cycle for Pressure Parts						8
19	Oil Abandonment Work						9
10	Underground Interferences						10
	All Other Identified Risks						11
	Total EMV						12

Estimate Uncertainty [\$M]

13

Total Project Risk Exposure & Estimate Uncertainty [\$M]

14

Remaining Contingency [\$M]

15

Contingency Coverage Ratio

16

b)Risk Descriptions and Mitigation Strategy

Existing Plant Equipment is not suitable for the New Design Conditions

Impact to:

Cost	☒	Schedule	☒	Performance	n/a	Environmental	n/a	Safety	n/a
------	-------------------------------------	----------	-------------------------------------	-------------	-----	---------------	-----	--------	-----

Risk: If the existing plant equipment required to support the gas burner configuration changes such as the Forced Draft fans, service air, instrument air, control valves, etc. does not meet the new design criteria, then the purchase and installation of replacement equipment will be required.

Trend: Current Ranking (Green) Impact = Moderate

Mitigation Plan: OEM engineering quotes are to be sourced to better determine new design conditions and feasibility of existing equipment to support configuration changes. After the vendor is selected and configuration changes scope defined, the risk impact is to be lowered or further evaluated.

Boiler configuration changes Unit 1 and Unit 2

Impact to:

Cost	☒	Schedule	☒	Performance	n/a	Environmental	n/a	Safety	n/a
------	-------------------------------------	----------	-------------------------------------	-------------	-----	---------------	-----	--------	-----

Risk: If the boiler assessments for Unit 1 and Unit 2 indicate a requirement for more extensive configuration changes than anticipated then the outage schedule may be extended and fabricated parts may be required. Both of these options would impact the cost and duration of the project.

Trend: Current Ranking (Green) Impact = Moderate.

Mitigation Plan: The Boiler Assessment for Unit 1 has been initiated and Unit 2 will soon follow. The assessments are scheduled for completion in the first quarter of 2012. The outcome of these assessments will determine what level (if any) of configuration changes are required. It will also establish the extent to which the cost and schedule are affected.

Super Heater Material Cost Unit 1 and Unit 2

Impact to:

Cost	☒	Schedule	☐	Performance	n/a	Environmental	n/a	Safety	n/a
------	-------------------------------------	----------	--------------------------	-------------	-----	---------------	-----	--------	-----

Risk: If the procurement cost for the super heater materials for Unit 1 and Unit 2 are significantly more than the expected case included in the estimate, then additional funding beyond the included contingency may be required.

Trend: Current Ranking (Green) Impact = Moderate.

Mitigation Plan: The materials will be competitively bid. The cost for the materials and installation will be compared against the level of performance guaranteed by the vendor as part of the selection criteria.

Potential damage to Plant from Construction Activities

Impact to:

Cost	☒	Schedule	☒	Performance	n/a	Environmental	n/a	Safety	n/a
------	-------------------------------------	----------	-------------------------------------	-------------	-----	---------------	-----	--------	-----

Risk: If the construction process damages existing equipment, then additional cost will be incurred to repair the damages.

Trend: Current Ranking (Green) Impact = Minimal

Mitigation Plan: Experienced contractors with proven track records will be selected for the request for proposal (RFP) process. Constructability reviews, including a site walk down, with the selected contractor and the project team will occur prior to contractor mobilization. This will address and formulate a mitigation strategy for working in any critical areas where there is a potential for existing equipment to be damaged.

Unknown DCS Compatibility

Impact to:

Cost	☒	Schedule	☒	Performance	n/a	Environmental	n/a	Safety	n/a
------	-------------------------------------	----------	-------------------------------------	-------------	-----	---------------	-----	--------	-----

Risk: If the DCS cannot be upgraded or if unforeseen issues arise with tying in the legacy oil equipment, then additional funding for the DCS may be required above what is included in the contingency.

Trend: Current Ranking (Green) Impact = Minimal

Mitigation Plan: This will be handled as part of the balance of plant (BOP) design scope, At that point the distributed control system (DCS) scope and identification of any potential issues will be determined, including multiple ways to mitigate any issues. PGN will determine the best course of action to take.

Procurement Cycle for Pressure Parts

Impact to:

Cost	☒	Schedule	☒	Performance	n/a	Environmental	n/a	Safety	n/a
------	-------------------------------------	----------	-------------------------------------	-------------	-----	---------------	-----	--------	-----

Risk: If the manufacturing schedule slips or if the vendor requires more than the 52 weeks assumed for manufacturing, then additional funding may be required to expedite the parts or the schedule could be delayed.

Trend: Current Ranking (Green) Impact = Minimal

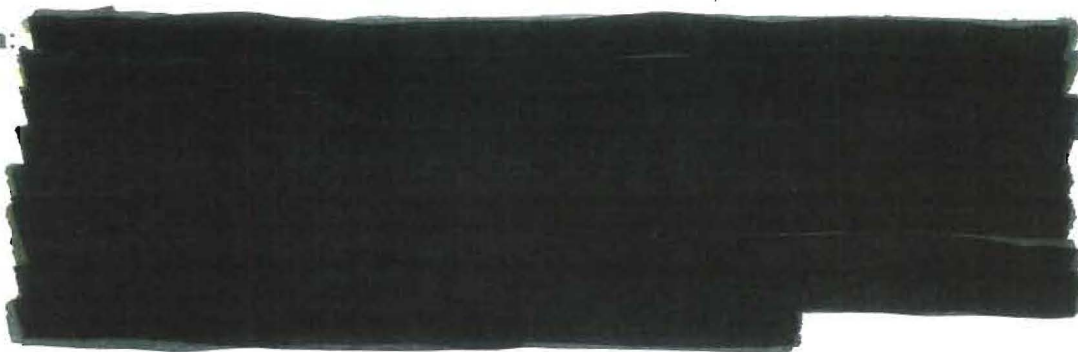
Mitigation Plan: The manufacturing lead time for the pressure parts will be addressed in the RFP. Depending on the responses, non-US manufactured parts may be determined to be the best course of action to meet the schedule. Another strategy would be to pay additional cost to expedite the pressure parts guaranteeing delivery in time to meet the outage schedule or the project could experience schedule delays.

CONFIDENTIALOil Abandonment Work**Impact to:**

Cost	☒	Schedule	☒	Performance	n/a	Environmental	n/a	Safety	n/a
------	-------------------------------------	----------	-------------------------------------	-------------	-----	---------------	-----	--------	-----

Risk: If the cost for removal and disposal is significantly more than estimated, then additional funding may be required if the project contingency is exceeded.

Trend: Current Ranking (Green) Impact = Minimal

Mitigation Plan:Underground Interferences**Impact to:**

Cost	☒	Schedule	☐	Performance	n/a	Environmental	n/a	Safety	n/a
------	-------------------------------------	----------	--------------------------	-------------	-----	---------------	-----	--------	-----

Risk: If the gas line route required the mitigation of underground interferences, then the cost could be an associated cost increase.

Trend: Current Ranking (Green) Impact = Minimal

Mitigation Plan: Extensive communication among the Fuel Gas Supplier, Plant and project team will be required in order to plan the underground gas supply line and to relocate the new M&R Station a. A plan for mitigating any indentified underground interferences will be developed. Once the route is planned, the route will be surveyed for any unknown interferences. In addition, a vac truck excavation may be required in areas where interferences are located. The extent to which underground interferences are identified, located and mitigated will drive the cost.

7) Economic Evaluation

a) Alternatives Considered

Two alternatives were considered in order to prepare the unit for compliance with EPA's Air Toxics Rule (Utility MACT). The first option is compliance through use of emissions controls, specifically low NOx burners and an electrostatic precipitator (ESP). The second option is compliance through conversion of the unit to operation on natural gas as the single fuel. A third option, discontinuation of heavy fuel oil use without conversion, was discarded because of its negative effect on fleet capacity and the resulting requirement to purchase or construct additional generation to meet reserve margin and operational requirements. In addition, this option does not preserve system flexibility and optionality with respect to achieving MACT compliance for other units in the fleet.

Capital costs for each of the two options under consideration were prepared by the NGPP estimating group. Estimates of the unit performance with and without the gas conversion were provided by the Maintenance and Diagnostic Center of the Power Generation Engineering group.

The Prosym™ model was used to evaluate the impacts on production costs.

The project has economic benefits in both capital cost and fuel savings. The capital cost for the gas conversion project is less than the capital cost for the emissions controls for oil fired compliance. The estimates of fuel cost differential (savings) are primarily to demonstrate that implementation of the gas conversion will not cause an increase in the system fuel cost that would result in a negative impact due to the project. The net impact on system fuel and operating cost is positive (savings) indicating an additional benefit.

b) Major NPV Components

The following table shows the Major NPV Components for the case of gas conversion compared to the emissions control (base) case. The values are differential and represent benefits or (costs) for the conversion of the unit to gas operation compared to the emissions control case.

Major NPV Components	After-Tax NPV (millions)
Capital	\$20.9
Oil Removal	(3.6)
Fuel Costs	\$207.3
Gas Reservations (Fixed Gas Transportation) ¹	(\$77.7)
Emissions ²	\$19.9
Production Costs other than Fuel and Emissions	\$2.6
Total	\$169.4*

¹ Gas reservation charges are based on the procurement of an additional 40,000 Dt/day. Costs allocated to this project are for the period of study only (2012 – 2018). Additional reservations would become part of system gas portfolio in later years.

² Emissions include estimated allowance prices for CSAPR ozone season NOx program beginning in 2012 and CO₂ allowance prices beginning in 2015. Delay of CSAPR to 2013 will result in a minor change in these savings (less than \$1M)

*net savings

c) Key Assumptions

Base Data

Base case modeling assumptions were consistent with the 2011 Ten Year Site Plan updated to include details of the scenario requested by the Public Service Commission in August 2011. The update included an adjustment to the forecast load due to the Commission's July ruling on DSM goals as well as an update of the anticipated return date for Crystal River Unit 3 to November 2014.

Fuel prices used were those associated with the 2011 Ten Year Site Plan (October 2010).

Resource Plan

Because the variation in unit output between the two cases was minimal, no changes in the base resource plan were considered in this analysis.

Alternative: Emissions Controls

A conceptual design for compliance with the MACT was prepared in 2010. This design was not updated to the specific requirements of the proposed rule released in March 2011. PGN anticipates that the total cost of the controls that would be required to achieve compliance will be greater than those initially estimated and the costs used here. To this extent, the analysis is conservative relative to the advantages of the gas conversion project.

The proposed emissions control alternative includes three compliance elements: Low NOx Burners, ESP for particulate and metals control, and SO₂ reduction via fuel switching.

The alternative of installing the low-NOx burners and the ESP had an estimated cost of \$91.7 million. This value has been used in this analysis. PGN recognizes, however, that this estimate was a preliminary estimate prepared primarily from industry data and was not prepared based on site specific preliminary engineering. While industry data may be conservative, typically estimates of this type are lower than the more definitive estimates prepared after engineering.

In discussion with ESS and NGPP, PGN determined that the two available alternate approaches for SO₂ control would be construction of a dry scrubber or fuel switching. Fuel switching to an ultra-low sulfur fuel would appear to be the preferred alternative. A cost for this fuel has not been provided, and is not included in this analysis.

The potential need for additional controls to meet as promulgated metals or acid gas emissions limits in the absence of a scrubber, e.g. sorbent injection, was not considered.

Unit Performance

For each case, the units' heat rates were modeled based on the recalculated heat rates prepared in October 2011. These heat rates were given for oil, gas, and blended operation. The blended operation values were used for the continuation (emissions control) case, and gas fired values for the conversion cases.

The analysis did consider an estimated efficiency improvement due to the discontinuation of auxiliary loads required for heavy oil operation in the gas conversion case.

As discussed above, no performance impact of the addition of emissions controls was modeled.

Based on estimates provided by strategic engineering, each unit was modeled to obtain a 10 MW uprate following the conversion, primarily attributed to the discontinuation of auxiliary loads associated with fuel oil operations.

Period of Analysis

The analysis is based on the current project schedule calling for conversion of Unit 1 in service June 2013 and Unit 2 in service December 2013.

The results shown are for an analysis covering the period 2013 through 2018 (all values shown in 2012 dollars. This period was selected because beyond 2018, alternate potential resource plans (e.g. additional resources required in the alternate case requiring retirement of Crystal River 1 & 2, and alternate cases for varying levels of Levy ownership) would result in a large number of potential scenarios for consideration. In the gas conversion case, fuel and emissions benefits continue to be realized in the years beyond 2018. The project will be required for compliance no later than the MACT compliance date (anticipated to be 1st quarter of 2015) and provides fuel benefits in the years prior to the final compliance date.

Differential CPVRR for the capital costs cover the complete capital revenue requirements for each alternative (i.e. the costs are not truncated in 2018).

Financial Assumptions

Consistent with the 2011 TYSP, the 2010 average cost of capital was used to discount future costs and benefits. Projects were considered to carry a 20 year life for tax purposes and a 13 year life for book purposes (consistent with the 2024 Anclote retirement currently shown in the depreciation schedules filed with the FPSC)

Fuel Considerations

An incremental 40,000 Dt/day fixed gas transportation requirement for Anclote was used as the base case, priced at an estimated daily demand rate of \$1.25 per Dt/day based on current indications. In consultation with the fuels group, this value is considered to be conservative. While the 40,000 Dt/day value is consistent with fuels modeling for Anclote incremental usage, some of the Anclote generation comes at the expense of other units to which we currently supply natural gas, and as a result, the actual portfolio requirement may vary. In addition, market opportunities may result in purchase of the fixed transportation at a lower price.

Fuels provided an alternate scenario price based on lower cost and lower total quantity of transportation required. This would result in an additional savings of approximately \$11.2 (NPV 2012\$) over the period of study in the gas conversion case.

Two options were considered for the removal of fuel oil remaining in inventory following the conversion to gas operation, with removal (by truck) and sale of the excess inventory or burning the excess inventory out of economic operation. The estimated cost for the removal and sale was less than the expected cost of out of economic consumption and was used in this analysis.

Exclusions

No changes were made in the base O&M costs for unit operations. In the gas conversion case, no specific savings were assumed related to O&M costs associated with operating and maintaining the fuel oil supply system. In the emissions control case, no additional O&M costs were assumed for the operation of the emissions control equipment.

In addition, no costs or savings were attributed to the potential closure of the oil pipeline as this will be considered as part of a separate project.

8) Organization

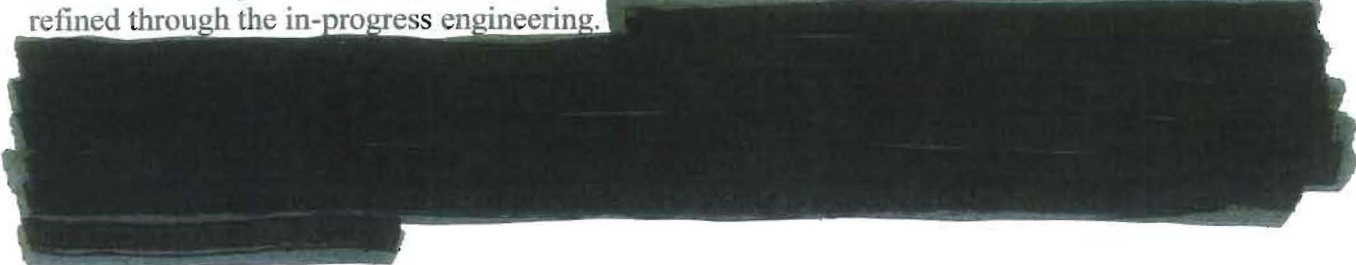
With converting to full load gas on both Anclote units no organizational changes for Anclote are anticipated. The conversion will impact the Bartow to Anclote pipeline organization once the second unit at Anclote is converted and the pipeline is retired.

9) Contract & Procurement Strategy

New Generation

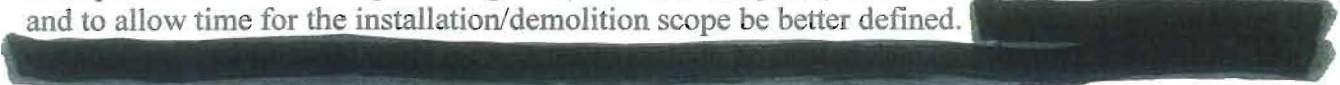
The contracting and procurement strategy has been developed to mitigate overall risks to the project with particular focus on preliminary engineering, long lead equipment/materials, and the outage schedule. To better define the scope of work, initial study evaluation scope has been released to a qualified engineering firm to develop technical specifications and list of studies and to a qualified boiler inspection firm to evaluate the current boiler condition. These initial evaluations should help mitigate cost and schedule risk to the project.

Following these relatively small initial study evaluations, the boiler configuration changes engineering ("Phase 1") and boiler pressure part supply ("Phase 2") will be competitively bid to major boiler original equipment manufacturers (OEMs). The boiler configuration changes engineering (Phase 1) includes thermal design, emissions estimates, control evaluation, detailed boiler condition assessment and analysis, demolition plan, and planning for technical field advisor support. The boiler pressure part supply (Phase 2) includes boiler tubes, headers, valves, burners, burner management system, platforms, grating, and other related equipment/materials. Phase 1 and Phase 2 will be bid at the same time and it is expected that Phase 1 will be awarded prior to Phase 2 since Phase 2 scope will be refined through the in-progress engineering.



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In addition to the Phase 1 and Phase 2 scope discussed above, scopes for balance-of-plant engineering and installation/demolition work will be competitively bid. These packages will be bid following completion of the initial engineering study and Phase 1 engineering. The boiler pressure parts supply (Phase 2) will be bid separately from the installation/demolition scope to maintain the integrity of multiple OEM bidders for pressure parts (i.e., not to disqualify those without install/demo capabilities) and to allow time for the installation/demolition scope be better defined.



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Fuels

FGT and PEF will execute a Construction, Operation, Maintenance, Ownership and Reimbursement Agreement ("Agreement").



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10) Change in Inventory Detail -

The disposition of the remaining fuel oil will be addressed in a separate project. A plan to disposition is currently being addressed by the Anclote Plant operations group.

11) Regulatory Requirements

The EPA issued the proposed Air Toxics Rule (MATS Rule) on March 16, 2011 which was published to the Federal Register on June 21, 2011. The final rule is was issued in early January 2012. Adoption of the new EGU MATS rule is expected to encompass generating units that burn in excess of 10% oil. This will include the Anclote Units.

In March 2006, Progress Energy Florida (PEF) filed with the Florida Public Service Commission (FPSC) its Integrated Clean Air Compliance Plan, which outlined a variety of options for compliance with the CAIR (Clean Air Interstate Rule); as well as the Clean Air Mercury Rule (CAMR). As proposed in that plan, PEF recommended Plan D, which included the environmental controls for CR North. In November 2006, the FPSC approved recovery of prudently incurred CAIR/CAMR costs for 2006 and 2007 through the Environmental Cost Recovery Clause (ECRC).

Progress Energy Florida filed updates to the Integrated Clean Air Compliance Plan with the Florida Public Service Commission in 2007, 2008, 2009, 2010 and 2011. In 2011 PEF requested certain limited costs for ECRC recovery associated with assessing the proposed MATS Rule, preparing comments for EPA, and developing compliance strategies within aggressive regulatory timeframes. These costs were approved for recovery and the Commission is aware that upon issuance of the EGU MATS rule, PEF will conduct detailed engineering and other analyses to develop compliance strategies for inclusion in an updated Integrated Clean Air Compliance Plan.

REGULATORY FILINGS

Upon SMC approval of the proposed Anclote MATS compliance plan, PEF file testimony with the Commission describing the project and outlining at a minimum the compliance options considered and why the gas conversion is in the best interests of the ratepayer. PEF anticipates filing as soon after management approval of the plan as reasonably possible preferably prior to entering into any significant contracts. PEF will also be required to address MATS implications in our Integrated Clean Air Compliance Plan in the annual update typically filed in early April.

RECOVERY MECHANISM

Progress Energy Florida is allowed to submit the costs to the Florida PSC for recovery under Florida Statute §366.8255 Environmental Cost Recovery Clause (ECRC), as long as the following criteria are met:

- Costs were prudently incurred after April 13, 1993.
- The activity is legally required to comply with a governmentally imposed environmental regulation enacted, became effective, or whose effect was triggered after the company's last test year upon which rates are based.
- Costs are not recovered through some other cost recovery mechanism or through base rates.

Under the ECRC, PEF begins to recover the cost of the project when the project goes into service. PEF is allowed to begin recovering AFUDC that it has accrued upon the project being placed in service. The PEF regulatory planning function provides internal guidance and recommendations on submissions for potential recovery. The final determination of the costs that will be recoverable through the ECRC is determined by the PSC.

12) External Relations Plan –

Community Relations

The overall community relations plan focuses on leveraging public support for the project through supporting stakeholders, monitoring activities of known detractors, such as environmental groups, and working with plant neighbors to advocate their support. There is no known opposition to plant conversion at this time. A comprehensive stakeholder analysis is being kept up-to-date based on activities occurring with similar off-system projects in order to anticipate issues that would hinder project execution and to develop specific plans to mitigate those issues. Weekly updates of public relations initiatives will continue throughout the project planning and construction phases. Risk analysis and cost allocation for execution of the public relations plan will be updated as needed throughout the process.

External Relations

The project team will work with internal community relations and plant communications personnel to respond to issues raised regarding this work. There is no known opposition to the Anclote Conversion at this time. A comprehensive stakeholder analysis will be performed by external relations in order to anticipate issues that would hinder project execution and develop plans to mitigate those issues.

Below provides various strategies for the external relations piece to will support the Anclote conversion project.

- Develop stakeholder list and contact information to include
 - Agencies – state/local
 - State Legislators – representing plant area
 - Local Elected officials (city/county), county staff
 - Key community leaders and groups
 - Property owners
 - HOA or civic associations for neighboring communities
 - Environmental and special interest groups

- Anclote park visitors/boaters
- Pasco Economic Development Council
- Pasco County School board for any schools within TBD proximity of the plant.
- FPC/PE Retirees

- Conduct outreach based on project plan and schedule
 - Prior to any external communications, permitting, or other external interactions with media, local government or agencies, it will be necessary to develop a plan for initial communications to city/county, agencies, other key stakeholders:
 - notification
 - briefing on project details
 - delivery of key messaging
 - build support for the project
 - Provide support and coordination to project team for permitting and approval processes required by local government and agencies. Utilize existing contacts to facilitate agency coordination and approval.
 - Develop plan and communications for impacted property owners and property owners in plant area.
 - Messaging regarding benefits and potential impacts
 - Timeline for the project
 - What property owners can expect
 - How to reach PE for issues and concerns – establish toll free#, email

Communications and Media Relations

- Messaging for state and local audiences – key messages, Q&A, external stakeholders handout
- Internal messaging for employees – “When Neighbors Ask”
- Press release

13) Internal Stakeholders-

Internal Stakeholders		
Stakeholder	Primary Contact	Role
Project sponsor	Kris Edmondaon	Provide operation oversight and input on matters after initial project approval and during construction.
Project manager	Joel Moran	Primary responsibility for planning, organizing, and managing resources to bring about the successful completion of project goals and objectives. Has ultimate responsibility for the project with a primary focus on new generation.
Asset owner	Reginald Anderson	Provides insight to site specific information. Receives asset final commissioned asset from the construction organization.
Operations	Reginald Anderson	Provides insight into post-project implementation costs, benefits, and concerns.
Environmental	Michael Shrader	Provides input to environmental and permitting issues and concerns as they arise.
Regulatory	Glenn Alex	Provides input on regulatory issues and concerns as they arise.
Supply Chain	Brooks Strickler	Provides contracting and procurement services for the new generation portion of the project.
Fuels	Joe McCallister	Provides input regarding fuel procurement and delivery.
Community Relations	Gail Simpson	Works with the community to respond to issues and concerns raised by the public.

14) Next Steps-

The following milestone meetings will provide Senior Management with updates on the project and the opportunity to defer, stop, or otherwise change the project direction as needed:

Next Steps	
Date	Milestone – Request
March 2012	To move into the next phase of commitments. Specifically securing equipment and signing the gas contract.
March 2013	Go Build IPP
<i>Further updates to be determined as the project develops</i>	

Appendix A - Assumptions

Item	Assumption	Owner
Project Assumptions		
Analysis Horizon		
Financial Assumptions		
Discount Rate		Corporate Planning
Marginal Tax Rate		Corporate Planning
Property Tax & Insurance Rate		Corporate Planning
Burden Rates		Corporate Planning
Escalation Rates		Corporate Planning

Anclote Conversion Project

Integrated Project Plan (IPP)

Financial Analysis Control Number: 2012-1641

Project Profile Ranking: Green III Project

The Anclote Conversion Project team plotted the project size and complexity using the PMCoE Project Profile Matrix Ranking Tool and determined that the Anclote Conversion Project ranks as a 'Green III Project'. Per procedure, the Anclote Conversion Project requires the assignment, at a minimum, of a Project Manager III (aka PM III). In addition, per procedure and at a minimum, the Anclote Conversion Project should comply with the Green requirements established within the PMCoE Enterprise Project Management Standards.

Please Note: This document contains confidential transmission information and is subject to Progress Energy's Standards of Conduct Procedure, #REG-SUBS-00002. Please do not distribute to Fuels & Power Optimization or Efficiency and Innovative Technology groups.

Sponsoring Business Unit:	Power Generation Florida
Funding Legal Entity:	PEF
Date Prepared:	03/26/2012

Key Project Contacts

Role, Department / Group	Name	Phone No.
Director, Project Development NGPPD	Mike Rib	VNet:230-4474
Manager, Project Development	John Robinson	VNet:770-6444
Business Services/ NGPPD	Candyce Marsh	VNet: 770-5227
Project Manager	Joel Moran	VNet: 770-2228
Gen Mgr-Suncoast-PGF	Larry Hatcher	VNet: 240-6335
Plt Mgr-Anclote	Bill Luke	VNet:220-3006
Mgr-Resource Planning-TOP PEF	Benjamin Borsch	VNet:220-4565
Supv- Reg Planning Projects PEF	Geoff Foster	VNet:230-5247

Plan Revision Control

Rev No.	Primary Author(s)	Revision Description	Rev Date
0	Joel Moran & Candyce Marsh	Initial IPP	01/2012
1	Joel Moran & Candyce Marsh	Gate 1- Go Commit	03/2012

Request for Approval

Purpose: ☐ Gate 0 - Initiate Project ☒ Gate 1 - Go Commit

☐ Gate 2 - Go Build / Baseline ☐ Revision

Authorization to make new commitments up to \$77.8 million * (entire project funding)

Authorization to spend additional funds up to \$ 78.6 million * (entire project funding)

Estimated total project cost \$ 49 million to \$ 87.6 million Expected Cost: \$79.3 (includes contingency)*

Next approval gate expected on: March 2013

Expected in-service date: June 2013 (Unit 1), December 2013 (Unit 2)

Notes or Exceptions:

* Full Financial View, including AFUDC

Approval Required

This IPP requires approval by the: Senior Management Committee

Approvals

The parties signing below indicate by their signature that they, or the body they represent below, have reviewed the IPP and either recommend approval of or approve the above Request for Approval.

Action	Name [Type / Print]	Reviewing Position	Signature	Date
Recommend Approval	Joel Moran	Project Manager, Mgr Proj Engring, NGPPD		
Recommend Approval	Larry Hatcher	Project Sponsor, Gen Mgr, Suncoast-PGF		
Recommend Approval	John Elnitsky	VP, NGPPD		
Recommend Approval	Jeff Swartz	VP, Power Generation-PEF		
Recommend Approval	Peter Toomey	VP, Finance, PEF		
Recommend Approval	Sasha Weintraub	VP, Fuels & Pwr Optimization		
Senior Management Committee Approval				
Approve		☐ Chief Executive Officer ☐ Chief Financial Officer ☐ General Counsel		
Approve	Jeff Lyash	Project Executive Sponsor		
Approve	Vinny Dolan	President & CEO PEF		

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1) Executive Summary -

Background-

On March 16, 2011, in compliance with a court-ordered deadline, the Environmental Protection Agency (EPA) released the proposed rule establishing Mercury and Air Toxics (MATS) standards for emissions of hazardous air pollutants (HAPs) from electric generating units (the “EGU MATS” or “Utility MATS”). On December 21, 2011, following the period for receipt and review of comments, the EPA released the final MATS rule which was published in the Federal Register on February 16, 2012. The rule imposes numerical limits on metals, including mercury and acid gas from oil and coal-fired power plants.

The Clean Air Act provides a 3-year time frame to comply with MATS standards. The permitting agency has the authority to add one year, and the President has the authority to add up to two additional years.

Proposed Project-

This project is to convert the existing Anclore Units 1 and 2 from their current use of #6 oil and natural gas to the exclusive use of natural gas in order to comply with the MATS standards. Two alternatives were considered in order to prepare the units for compliance. The first option is compliance through the use of emissions controls, specifically low NOx burners and an electrostatic precipitator (ESP). The second option is compliance through the conversion of the units to operation on natural gas as the single fuel. Conversion to natural gas provides the best overall economic benefit.

While compliance with the MATS standards is not required until first quarter of 2015, the proposed timing for the Anclore conversion will help mitigate any potential schedule delays due to permitting, construction, fuel gas supply etc. and should provide the additional benefit of fuel savings by switching from oil to the use of natural gas.

Of the risks identified in the Risk Register for the proposed project, the most significant are the extent of configuration changes to the existing boilers to support the conversion to natural gas. Additionally, this includes determining the suitability of the current balance of plant equipment to support the new design. To mitigate these risks, an engineering study was initiated with the boiler OEM supplier to perform an engineering analysis on the unit to determine the boiler configuration changes needed to convert each of the units. Review of the adequacy of existing balance of plant equipment that is closely associated with the operation of the boiler has been considered in the initial engineering work for the project.

The project cost is estimated to be between \$49.0 million and \$87.6 million (Class 4 estimate) with an expected cost of \$79.3 million. In service dates for the converted units are June 2013 for Unit 1 and December 2013 for Unit 2.

Recommendation-

The project team requests senior management approval of the full project cost of \$79.3 million. This will allow the project to move into firm commitments to ensure the project meets key milestone outlined in this document. These critical commitments include the boiler OEM and the gas contract. The boiler OEM will design and supply the burner and pressure parts. The gas contract addresses for the modification of the M&R station needed to support the increased supply to the station.

2) Scope

Generation

The Anclote Generation Plant consists of two units that burn both Number 6 fuel oil and natural gas. The units currently have a maximum summer rating of 500MW and 510 MW for units 1 & 2, respectively. The current natural gas firing capability for each unit is limited to 40% of the total heat input. The balance of the heat input is from heavy fuel oil. The units as currently configured can operate on 100% heavy oil.

Preliminary studies indicate that the addition of three levels of fuel gas burners in combination with the existing natural gas burners will be required to provide full output on 100% natural gas. The option to co-fire natural gas and heavy fuel oil will no longer be possible once the planned conversion is completed.

The preliminary thermal analysis of the boiler for operation on 100% natural gas indicates that a portion of the lower horizontal superheater will need to be removed to limit heat absorption and manage superheater tube metal temperatures. In addition, the gas supply line M&R station will require an upgrade and relocation. Finally, the finishing horizontal super heater for each unit will require metallurgy upgrades to accommodate the peak temperatures resultant from the gas conversion. While the additional burners and the replacement superheater form the majority of the boiler work required, other areas of the boiler may require configuration changes to complete the conversion based on other boiler engineering analysis and condition assessment (e.g., convection pass baffle replacement).

At this time, final thermal design calculations, emissions estimates, furnace vibration analysis, and a furnace draft assessment have been completed. These assessment results are in review. The initial review of this report indicate a boiler modification plan that is similar to the preliminary results. The report has also expanded in detail to include recommendations for the back pass baffle design to manage vibration concerns. As a result of the vibration analysis that was performed, additional recommendation were noted for action to improve the forced draft fan performance to maximize the performance of the unit in the converted state.

In view of the final study results and recognizing that the changes from the preliminary report are not significant, the recommendations from the preliminary studies performed remain as the basis for the estimate.

While the major impacts to the boiler have been identified in the OEM final report, other impacts to the boiler are not known at this time. While these remaining items are anticipated to be minor, the risk assessment includes the potential project impact for boiler configuration changes that are found during the detailed design of the boiler modifications identified .

It is estimated that both Units will require a ten week outage to perform the installation. Unit 1 will be in the Spring of 2013 and Unit 2 will follow in the Fall of 2013. The estimate assumes that demobilization and a re-mobilization will occur between the outages.

Fuel



3) Key Milestones & Project Gates –

Below are key milestone deliverables and project gates.

Key Milestones & Project Gates				
Milestone	Date			Critical Path (y/n)
	Baseline	Forecast	Actual	
Gate 0- Initiate Project	January 2012	January 2012	January 2012	Y
Boiler Engineering (Contracting Strategy Phase 1)	January 2012	January 2012	January 2012	Y
Gate 1-Go Commit	March 2012	March 2012		Y
Sign Equipment Contracts (Contracting Strategy Phase 2)	April 2012	April 2012		Y
Sign Gas Contract	April 2012	April 2012		Y
Sign Construction Contract	November 2012	November 2012		Y
Gate 2- Go Build	March 2013	March 2013		Y
Mobilization Unit 1	March 2013	March 2013		Y
Mobilization Unit 2	September 2013	September 2013		Y
In-Service Date (Unit 1)	June 2013	June 2013		Y
In-Service Date (Unit 2)	December 2013	December 2013		Y

4) Estimated Project Cost

a) Project Cost History (for recurring IPP submissions)

Total Project Cost History – (\$ in Millions)			
IPP version/Date	Expected	Estimate Range	Estimate Class [AACEI]
Rev 0 01/2012	\$77.4	\$52.8-\$87.5	Class 5
Rev 1 03/2012	\$79.3	\$49.0-\$87.6	Class 4

See PJM-SUBS-00005 Project Cost & Financial Management for AACEI Estimate Class definition and guidance. For Class 3, 2, 1 estimate the Estimate Range should be noted as N/A. Total Project Cost (Required only prior to establishing Baseline)

The cost estimate Class 4 per AACE's classification which is derived from the percent complete of design engineering (Typically 1-15%). The Low and High values for the Total Direct Cost & AFUDC represent a -25% and +25% range around the Expected case.

Total Project Cost (\$ Millions)			
Cost component	Low	Expected	High
Capital			
Gas Burner Assemblies			
Super Heater Parts			
M&R Station & Fuel Gas Supply Line			
Construction			
Owner's Cost			
Total Direct Costs	48.4	64.1	77.1
Burdens	0.6	0.8	1.0
Total Capex	\$49.0	\$64.9	\$78.1
AFUDC	0	4.1	\$5.8
Total Direct Cost & AFUDC	\$49.0	\$69.0	\$83.9
Contingency- Estimate Uncertainty			
Contingency- Risk Register			
All-In Financial View	\$49.0	\$79.3	\$87.6

Note:

- This project is not subject to joint ownership.
- Cost of Removal has been estimated at [REDACTED]
- The Risk Register contingency includes the EMV. The Total Cost Impact [REDACTED]

Capital Expenditures by Year

CapEx	2012	2013	2014	Total
Rev 0 IPP (January 2012)	\$35.9	\$34.7	\$1.6	\$72.3
This IPP	\$25.2	\$48.1	\$1.8	\$75.2
Difference	\$10.7	(\$13.4)	(\$0.2)	(\$2.9)

In February 2012, the PEF Finance Committee approved the 2012 capital estimate cost associated with the Anclore Conversion project. This request was to transfer \$7.8m for PEF Operations and to request an additional \$28.1 by NGPPD. The total of this request is \$35.9 based on the Class 5 estimate in the IPP rev 0 from January 2012.

Changes in cashflow are based on more refined information. However, as contracts are signed and once a project schedule is developed changes in the cashflow maybe expected.

AFUDC by Year

AFUDC	2012	2013	Total
Rev 0 IPP (January 2012)	\$1.1	\$4.0	\$5.1
This IPP	\$0.4	\$3.7	\$4.1
Difference	\$0.7	\$0.3	\$1.0

Changes are from change in current expected estimate cashflow and the use of the current AFUDC rate.

5) Post Implementation Incremental Operational Costs

With converting to full load gas on both Anclore units no organizational changes for Anclore are anticipated. As such, no significant non-fuel O&M expense changes are anticipated at this time.

6) Risk Assessment

The Enterprise Risk Management Framework (ERM-SUBS-00021) was followed to identify the standardized risk types for the project. The major risks for this project are summarized below.

a) Risk Matrix

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Probability						
	Very High [90-100%]					
	High [66-89%]					
	Moderate [34-65%]					
	Low [11-33%]					
	Very Low [0-10%]					
		Minimal	Moderate	Significant	Severe	Critical
		<2%	<5%	<10%	<15%	>15%

Risk ID	Risk Name	Total Cost Impact [\$M]	Probability of Occurrence	Total EMV [\$M]
1	Existing Equipment not suitable for new design conditions - Fans, Service Air, control valves, instrument air, etc			
2	Boiler Repairs - U2			
3	Boiler Repairs - U1			
9	Oil Abandonment Work			
7	Unknown DCS compatibility			
10	Underground Interferences			
11	Unknown condition of equipment at interface points			
13	Temporary modifications to support construction			
19	De-rating Unit 1			
20	De-rating Unit 2			
	All other Identified Risk			
	Total EMV			

Estimate Uncertainty [\$M]

Total Project Risk Exposure & Estimate Uncertainty [\$M]

Remaining Contingency [\$M]

Contingency Coverage Ratio

b)Risk Descriptions and Mitigation StrategyExisting Plant Equipment is not suitable for the New Design Conditions**Impact to:**

Cost	☒	Schedule	☒	Performance	n/a	Environmental	n/a	Safety	n/a
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Risk: If the existing plant equipment required to support the gas burner configuration changes such as the Forced Draft fans, service air, instrument air, control valves, etc. does not meet the new design criteria, then the purchase and installation of replacement equipment will be required.

Trend: Current Ranking (Yellow) Impact = Moderate

Mitigation Plan: OEM engineering was sourced to better determine new design conditions and assess of existing equipment to support configuration changes.

Boiler configuration changes Unit 1 and Unit 2**Impact to:**

Cost	☒	Schedule	☒	Performance	n/a	Environmental	n/a	Safety	n/a
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Risk: If the boiler assessments for Unit 1 and Unit 2 indicate a requirement for more extensive configuration changes than anticipated then the outage schedule may be extended and fabricated parts may be required. Both of these options would impact the cost and duration of the project.

Trend: Current Ranking (Green) Impact = Moderate

Mitigation Plan: The Boiler Assessment for Unit 1 has been initiated and Unit 2 will soon follow. The assessments are due to complete by March 2012. Preliminary study findings suggest minor modifications are proposed. Final outcome of these assessments will determine what level (if any) of configuration changes are required

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Unknown DCS Compatibility

Impact to:

Cost	☒	Schedule	☒	Performance	n/a	Environmental	n/a	Safety	n/a
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Risk: If the DCS cannot be upgraded or if unforeseen issues arise with tying in the legacy oil equipment, then additional funding for the DCS may be required above what is included in the contingency.

Trend: Current Ranking (Green) Impact = Minimal

Mitigation Plan: An assessment of the current DCS system was done and impact value of this risk were lowered. I/O cabinet's procurement and modification to existing systems are being scoped as part of the assessment. This will be handled as part of the balance of plant (BOP) design scope.

Oil Abandonment Work

Impact to:

Cost	☒	Schedule	☒	Performance	n/a	Environmental	n/a	Safety	n/a
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Risk: If the cost for removal and disposal is significantly more than estimated, then additional funding may be required if the project contingency is exceeded.

Trend: Current Ranking (Green) Impact = Minimal

Mitigation Plan:



Underground Interferences**Impact to:**

Cost	☒	Schedule	☐	Performance	n/a	Environmental	n/a	Safety	n/a
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Risk: If the gas line route required the mitigation of underground interferences, then the cost could be an associated cost increase.

Trend: Current Ranking (Green) Impact = Minimal

Mitigation Plan: Some preliminary mitigation plans that are being currently evaluated are, using a pipe rack for the gas line vs. going underground, location of the M&R station to be closer to the plant thus eliminating chances for underground interferences. Once the route is planned, the route will be surveyed for any unknown interferences again. In addition, a vac truck excavation may be required in areas where interferences are located. The extent to which underground interferences are identified, located and mitigated will drive the cost. A further plan for mitigating any identified underground interferences will also be developed for any additional work.

Unknown condition of equipment at interface points**Impact to:**

Cost	☒	Schedule	☒	Performance	n/a	Environmental	n/a	Safety	n/a
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Risk: If the scope associated with the interface points where the new equipment will tie into existing equipment are beyond what is currently estimated, then additional cost will be incurred to include the additional scope.

Trend: Current Ranking (Green) Impact = Minimal

Mitigation Plan: The plan is to identify interface points while engineering is designing tie offs to existing equipment. This will be done through interfacing with the PIT team during design reviews.

Modification to support construction**Impact to:**

Cost	☒	Schedule	n/a	Performance	n/a	Environmental	n/a	Safety	n/a
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Risk: If modifications to the existing structures or equipment are required to support construction, then additional cost will be incurred to include this scope change. (Modifications for existing structures and/ or equipment is required to support the construction activities)

Trend: Current Ranking (Green) Impact = Minimal

Mitigation Plan: Plan is to identify any major modifications during constructability reviews. Also project team will continuously monitor and control modifications and changes to existing structure.

De-rating Unit 1 & 2**Impact to:**

Cost	☒	Schedule	☒	Performance	n/a	Environmental	n/a	Safety	n/a
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Risk:

If the existing plant equipment required to support the gas burner configuration changes such as the FD Fans, service air, instrument air, control valves, etc. does not meet the new design criteria, then the purchase and installation of replacement equipment will be required. With the primary concern of shortfall anticipated in the FD fan performance. The Alstom report indicates a potential shortfall in combustion air of 12%.

Trend:

Current Ranking (Green) Impact = Significant

Mitigation Plan: OEM engineering was sourced to better determine new design conditions and assess of existing equipment to support configuration changes. There are several items identified to improve the FD fans' performance that will mitigate the replacement. This includes:

- Thorough cleaning of the economizer gas side (reduces gas side dP, improves boiler efficiency)
- Removal of steam coils presently used for cold end corrosion mitigation
- Repair of air heater seals (ongoing for U1)
- Replacement of air heater baskets with a lower dP design (ongoing for U1)
- Availability of aux steam previously dedicated to fuel oil heating and steam coil air tempering function for power generation

7) Economic Evaluation

The economic analysis remains unchanged from the January 2012 IPP (Rev 0). As updates to the current expected case estimates were not material and would not produce material difference in the economic analysis.

a) Alternatives Considered

Two alternatives were considered in order to prepare the unit for compliance with EPA's Air Toxics Rule (Utility MATS): The first option is compliance through use of emissions controls, specifically low NOx burners and an electrostatic precipitator (ESP). The second option is compliance through conversion of the unit to operation on natural gas as the single fuel. A third option, discontinuation of heavy fuel oil use without conversion, would have had a negative effect on fleet capacity and the resulting requirement to purchase or construct additional generation to meet reserve margin and operational requirements, including potential system reliability impacts. In addition, this option does not preserve system flexibility and optionality with respect to achieving MATS compliance for other units in the fleet.

Capital costs for each of the two options under consideration were prepared by the NGPP estimating group. Estimates of the unit performance with and without the gas conversion were provided by the Maintenance and Diagnostic Center of the Power Generation Engineering group.

The Prosym™ model was used to evaluate the impacts on production costs.

The project has economic benefits in both capital cost and fuel savings. The capital cost for the gas conversion project is less than the capital cost for the emissions controls for oil fired compliance. The estimates of fuel cost differential (savings) are primarily to demonstrate that implementation of the gas conversion will not cause an increase in the system fuel cost that would result in a negative impact due to the project. The net impact on system fuel and operating cost is positive (savings) indicating an additional benefit.

b) Major NPV Components

The following table shows the Major NPV Components for the case of gas conversion compared to the emissions control (base) case. The values are differential and represent benefits or (costs) for the conversion of the unit to gas operation compared to the emissions control case.

Major NPV Components	After-Tax NPV (millions)
Capital	\$20.9
Oil Removal	(3.6)
Fuel Costs	\$207.3
Gas Reservations (Fixed Gas Transportation) ¹	(\$77.7)
Emissions ²	\$19.9
Production Costs other than Fuel and Emissions	\$2.6
Total	\$169.4*

¹Gas reservation charges are based on the procurement of an additional 40,000 Dt/day. Costs allocated to this project are for the period of study only (2012 – 2018). Additional reservations would become part of system gas portfolio in later years.

² Emissions include estimated allowance prices for CSAPR ozone season NOx program beginning in 2012 and CO₂ allowance prices beginning in 2015. Delay of CSAPR to 2013 will result in a minor change in these savings (less than \$1M)

*net savings

c) Key Assumptions

Base Data

Base case modeling assumptions were consistent with the 2011 Ten Year Site Plan updated to include details of the scenario requested by the Public Service Commission in August 2011. The update included an adjustment to the forecast load due to the Commission's July ruling on DSM goals as well as an update of the anticipated return date for Crystal River Unit 3 to November 2014.

Fuel prices used were those associated with the 2011 Ten Year Site Plan (October 2010).

Resource Plan

Because the variation in unit output between the two cases was minimal, no changes in the base resource plan were considered in this analysis.

Alternative: Emissions Controls

A conceptual design for compliance with the MATS was prepared in 2010. This design was not updated to the specific requirements of the proposed rule released in March 2011. PGN anticipates that the total cost of the controls that would be required to achieve compliance will be greater than those initially estimated and the costs used here. To this extent, the analysis is conservative relative to the advantages of the gas conversion project.

The proposed emissions control alternative includes three compliance elements: Low NOx Burners, ESP for particulate and metals control, and SO₂ reduction via fuel switching.

The alternative of installing the low-NOx burners and the ESP had an estimated cost of \$91.7 million. This value has been used in this analysis. PGN recognizes, however, that this estimate was a preliminary estimate prepared primarily from industry data and was not prepared based on site specific preliminary engineering. While industry data may be conservative, typically estimates of this type are lower than the more definitive estimates prepared after engineering.

In discussion with ESS and NGPP, PGN determined that the two available alternate approaches for SO₂ control would be construction of a dry scrubber or fuel switching. Fuel switching to an ultra-low sulfur fuel would appear to be the preferred alternative. A cost for this fuel has not been provided, and is not included in this analysis.

The potential need for additional controls to meet as promulgated metals or acid gas emissions limits in the absence of a scrubber, e.g. sorbent injection, was not considered.

Unit Performance

For each case, the units' heat rates were modeled based on the recalculated heat rates prepared in October 2011. These heat rates were given for oil, gas, and blended operation. The blended operation values were used for the continuation (emissions control) case, and gas fired values for the conversion cases.

The analysis did consider an estimated efficiency improvement due to the discontinuation of auxiliary loads required for heavy oil operation in the gas conversion case.

As discussed above, no performance impact of the addition of emissions controls was modeled.

Period of Analysis

The analysis is based on the current project schedule calling for conversion of Unit 1 in service June 2013 and Unit 2 in service December 2013.

The results shown are for an analysis covering the period 2013 through 2018 (all values shown in 2012 dollars. This period was selected because beyond 2018, alternate potential resource plans (e.g. additional resources required in the alternate case requiring retirement of Crystal River 1 & 2, and alternate cases for varying levels of Levy ownership) would result in a large number of potential scenarios for consideration. In the gas conversion case, fuel and emissions benefits continue to be realized in the years beyond 2018. The project will be required for compliance no later than the MATS compliance date (anticipated to be 1st quarter of 2015) and provides fuel benefits in the years prior to the final compliance date.

Differential Cumulative Present Value of Revenue Requirements (CPVRR) for the capital costs cover the complete capital revenue requirements for each alternative (i.e. the costs are not truncated in 2018).

Financial Assumptions

Consistent with the 2011 Ten Year Site Plan (TYSP), the 2010 average cost of capital was used to discount future costs and benefits. Projects were considered to carry a 20 year life for tax purposes

and a 13 year life for book purposes (consistent with the 2024 Anclote retirement currently shown in the depreciation schedules filed with the FPSC)

Fuel Considerations

An incremental 40,000 Dt/day fixed gas transportation requirement for Anclote was used as the base case, priced at an estimated daily demand rate of \$1.25 per Dt/day based on current indications. While the 40,000 Dt/day value is consistent with fuels modeling for Anclote incremental usage, some of the Anclote generation comes at the expense of other units to which we currently supply natural gas, and as a result, the actual portfolio requirement may vary.

Fuels provided an alternate scenario price based on lower cost and lower total quantity of transportation required. This would result in an additional savings of approximately \$11.2 (NPV 2012\$) over the period of study in the gas conversion case.

Two options were considered for the removal of fuel oil remaining in inventory following the conversion to gas operation, with removal (by truck) and sale of the excess inventory or burning the excess inventory out of economic operation. The estimated cost for the removal and sale was less than the expected cost of out of economic consumption and was used in this analysis.

Exclusions

No changes were made in the base O&M costs for unit operations. In the gas conversion case, no specific savings were assumed related to O&M costs associated with operating and maintaining the fuel oil supply system. In the emissions control case, no additional O&M costs were assumed for the operation of the emissions control equipment.

In addition, no costs or savings were attributed to the potential closure of the oil pipeline as this will be considered as part of a separate project.

8) Organization

With converting to full load gas on both Anclote units no organizational changes for Anclote are anticipated. The conversion will impact the Bartow to Anclote pipeline organization once the second unit at Anclote is converted and the pipeline is retired.

9) Contract & Procurement Strategy

New Generation

The contracting and procurement strategy has been developed to mitigate overall risks to the project with particular focus on preliminary engineering, long lead equipment/materials, and the outage schedule. To better define the scope of work, initial study evaluation scope has been released to a qualified engineering firm to develop technical specifications and list of studies and to a qualified boiler inspection firm to evaluate the current boiler condition. These initial evaluations should help mitigate cost and schedule risk to the project.

Following completion of these relatively small initial study evaluations, the boiler modification engineering ("Phase 1") and boiler pressure part supply ("Phase 2") was competitively bid to major boiler original equipment manufacturers (OEMs) in late 2011. The boiler modification engineering (Phase 1) includes thermal design, emissions estimates, control evaluation, detailed boiler condition assessment and analysis, demolition plan, and planning for technical field advisor support. The boiler pressure part supply (Phase 2) includes boiler tubes, headers, valves, burners, burner management

system, platforms, grating, and other related equipment/materials. Phase 1 and Phase 2 were bid at the same time and Phase 1 was awarded in January 2012 to allow Phase 2 scope to be refined through the Phase 1 engineering.

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In addition to the Phase 1 and Phase 2 scope discussed above, scopes for balance-of-plant engineering and installation/demolition work will be competitively bid. These packages will be bid following completion of the initial engineering study and Phase 1 engineering. A request for information for balance-of-plant engineering was issued to several qualified engineering firms in March 2012. The boiler pressure parts supply (Phase 2) has been bid separately from the installation/demolition scope to maintain the integrity of multiple OEM bidders for pressure parts (i.e., not to disqualify those without install/demo capabilities) and to allow time for the installation/demolition scope to be better defined. The installation/demolition scope is expected to be bid later in 2012.

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Fuels

FGT and PEF will execute a Construction, Operation, Maintenance, Ownership and Reimbursement Agreement ("Agreement").

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10) Change in Inventory Detail -

The disposition of the remaining fuel oil will be addressed in a separate project. A plan to disposition is currently being addressed by the Anclote Plant operations group.

Currently, there will be approximately \$400K written off in oil parts inventory. Inventory associated with making the units 100% will be approximately \$300K

11) Regulatory Requirements

The EPA issued the proposed Air Toxics Rule (MATS Rule) on March 16, 2011 which was published to the Federal Register on June 21, 2011. The final rule was released on December 21, 2011.

In March 2006, Progress Energy Florida (PEF) filed with the Florida Public Service Commission (FPSC) its Integrated Clean Air Compliance Plan, which outlined a variety of options for compliance with the CAIR (Clean Air Interstate Rule); as well as the Clean Air Mercury Rule (CAMR). As proposed in that plan, PEF recommended Plan D, which included the environmental controls for CR North. In November 2006, the FPSC approved recovery of prudently incurred CAIR/CAMR costs for 2006 and 2007 through the Environmental Cost Recovery Clause (ECRC).

Progress Energy Florida filed updates to the Integrated Clean Air Compliance Plan with the Florida Public Service Commission in 2007, 2008, 2009, 2010 and 2011. In 2011 PEF requested certain limited costs for ECRC recovery associated with assessing the proposed MATS Rule, preparing comments for EPA, and developing compliance strategies within aggressive regulatory timeframes. These costs were approved for recovery and the Commission is aware that upon issuance of the EGU MATS rule, PEF will conduct detailed engineering and other analyses to develop compliance strategies for inclusion in an updated Integrated Clean Air Compliance Plan.

REGULATORY FILINGS

Upon SMC approval of the proposed Anclote MATS compliance plan, PEF will file testimony with the Commission describing the project and outlining at a minimum the compliance options considered and why the gas conversion is in the best interests of the ratepayer. PEF anticipates filing as soon after management approval of the plan as reasonably possible. PEF will also be required to address MATS implications in our Integrated Clean Air Compliance Plan in the annual update typically filed in early April.

RECOVERY MECHANISM

Progress Energy Florida is allowed to submit the costs to the Florida PSC for recovery under Florida Statute §366.8255 Environmental Cost Recovery Clause (ECRC), as long as the following criteria are met:

- Costs were prudently incurred after April 13, 1993.
- The activity is legally required to comply with a governmentally imposed environmental regulation enacted, became effective, or whose effect was triggered after the company's last test year upon which rates are based.
- Costs are not recovered through some other cost recovery mechanism or through base rates.

Under the ECRC, PEF begins to recover the cost of the project when the project goes into service. PEF is allowed to begin recovering AFUDC that it has accrued upon the project being placed in service. The PEF regulatory planning function provides internal guidance and recommendations on submissions for potential recovery. The final determination of the costs that will be recoverable through the ECRC is determined by the PSC.

12) External Relations Plan –

External Relations

The overall external relations plan focuses on leveraging public support for the project through stakeholder communications, monitoring and addressing areas of opposition, and working with plant neighbors to keep them informed and address concerns. There is no known opposition to plant conversion at this time. The project is expected to garner support from within the Pasco County from local officials, key leaders and property owners based on the conversion from oil to gas.

A comprehensive stakeholder analysis will be maintained in order to anticipate issues that would hinder project execution and to develop specific plans to mitigate those issues working with Corporate Communications and plant personnel. Weekly updates of public relations initiatives will continue throughout the project planning and construction phases. Risk analysis and cost allocation for execution of the public relations plan will be updated as needed throughout the process.

Below provides various strategies for the external relations activities to support the Anclote conversion project.

- Develop stakeholder list and contact information to include
 - Agencies – state/local
 - State Legislators – representing plant area
 - Local Elected officials (city/county), county staff
 - Key community leaders and groups
 - Property owners
 - HOA or civic associations for neighboring communities
 - Environmental and special interest groups
 - Anclote park visitors/boaters
 - Pasco Economic Development Council
 - Pasco County School board for any schools within TBD proximity of the plant.
 - FPC/PE Retirees
- Conduct outreach based on project plan and schedule
 - Prior to any external communications, permitting, or other external interactions with media, local government or agencies, it will be necessary to develop a plan for initial communications to city/county, agencies, other key stakeholders:
 - notification
 - briefing on project details
 - delivery of key messaging
 - build support for the project
 - Provide support and coordination to project team for permitting and approval processes required by local government and agencies. Utilize existing contacts to facilitate agency coordination and approval.
 - Develop plan and communications for impacted property owners and property owners in plant area.
 - Messaging regarding benefits and potential impacts
 - Timeline for the project

- What property owners can expect
- How to reach PE for issues and concerns – establish toll free#, email
- Communicate any plan or schedule changes to local officials, agencies and key stakeholders throughout the project

As appropriate, employees and retirees will be briefed on the project.

Communications and Media Relations

- Messaging for state and local audiences – key messages, Q&A, external stakeholders handout
- Internal messaging for employees – “When Neighbors Ask”
- Press release

13) Internal Stakeholders-

Internal Stakeholders		
Stakeholder	Primary Contact	Role
Project sponsor	Larry Hatcher	Provide operation oversight and input on matters after initial project approval and during construction.
Project manager	Joel Moran	Primary responsibility for planning, organizing, and managing resources to bring about the successful completion of project goals and objectives. Has ultimate responsibility for the project with a primary focus on new generation.
Asset owner	Bill Luke	Provides insight to site specific information. Receives final commissioned asset from the construction organization.
Operations	Bill Luke	Provides insight into post-project implementation costs, benefits, and concerns.
Environmental	Michael Shrader	Provides input to environmental and permitting issues and concerns as they arise.
Regulatory	Glenn Alex	Provides input on regulatory issues and concerns as they arise.
Supply Chain	Brooks Strickler	Provides contracting and procurement services for the new generation portion of the project.
Fuels	Joe McCallister	Provides input regarding fuel procurement and delivery.
Community Relations	Gail Simpson	Works with the community to respond to issues and concerns raised by the public.

14) Next Steps-

The following milestone meetings will provide Senior Management with updates on the project and the opportunity to defer, stop, or otherwise change the project direction as needed:

Next Steps	
Date	Milestone – Request
March 2012	To move into the next phase of commitments. Specifically securing equipment and signing the gas contract.
March 2013	Go Build IPP
<i>Further updates to be determined as the project develops</i>	

PEF Emissions Study**2011 PEF Ten Year Site Plan (Anclote Gas Conversion)****PRODUCTION COST \$000****Annual**

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
<i><u>Fuel</u></i>										
Steam-Coal	517,416	569,516	617,275	443,075	479,054	491,053	514,779	497,565	514,805	445,935
Steam-Oil	237,756	285,181	328,520	258,252	285,792	298,158	307,881	284,389	280,794	252,350
Steam-CC	957,056	1,065,974	1,084,421	1,191,551	1,227,989	1,235,848	1,323,058	1,513,932	1,699,474	1,625,657
CT	76,309	83,396	105,518	61,281	96,432	113,681	142,333	158,735	133,617	91,271
Nuclear	0	0	10,805	65,016	61,224	70,699	64,431	76,877	71,234	149,952
<u>Fuel Sub-Total</u>	<u>1,788,537</u>	<u>2,004,067</u>	<u>2,146,540</u>	<u>2,019,174</u>	<u>2,150,491</u>	<u>2,209,439</u>	<u>2,352,483</u>	<u>2,531,498</u>	<u>2,699,926</u>	<u>2,565,166</u>
<i><u>NH3</u></i>	15,911	17,900	16,557	14,192	14,276	14,637	14,741	13,895	14,558	12,491
<i><u>CaCO3</u></i>	7,747	8,036	8,085	6,475	6,489	6,803	6,926	6,519	7,047	5,913
<i><u>CO2</u></i>	-	-	-	650,731	709,318	762,874	843,087	888,168	961,773	912,607
<i><u>Pur Pwr</u></i>										
Cogen	500,409	494,184	382,339	392,933	425,761	441,974	461,788	483,250	505,892	521,942
Tran-Purc	331,748	359,702	368,956	296,232	238,219	205,268	215,073	209,822	193,427	164,006
<u>Pur Pwr Sub-Total</u>	<u>832,157</u>	<u>853,886</u>	<u>751,295</u>	<u>689,165</u>	<u>663,980</u>	<u>647,242</u>	<u>676,860</u>	<u>693,072</u>	<u>699,319</u>	<u>685,947</u>
<u>TOTAL</u>	<u>2,644,352</u>	<u>2,883,889</u>	<u>2,922,477</u>	<u>3,379,737</u>	<u>3,544,554</u>	<u>3,640,995</u>	<u>3,894,097</u>	<u>4,133,153</u>	<u>4,382,623</u>	<u>4,182,123</u>

PEF-120103-EI-00094

PEF Emissions Study**2011 PEF Ten Year Site Plan (Anclote Gas Conversion)**

GWh

ANNUAL

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
CR NUC 3	0	0	1,394	8,271	7,722	8,271	7,472	8,271	7,608	8,271
NUC Future 1										5,203
<u>Nuclear, Total</u>	<u>0</u>	<u>0</u>	<u>1,394</u>	<u>8,271</u>	<u>7,722</u>	<u>8,271</u>	<u>7,472</u>	<u>8,271</u>	<u>7,608</u>	<u>13,475</u>
<u>Steam-Coal</u>										
CRYSTAL 1	1,490	1,518	1,614	925	1,114	1,187	1,363	1,251	1,139	984
CRYSTAL 2	1,954	2,191	2,415	1,304	1,653	1,656	1,813	1,800	1,605	1,334
CRYSTAL 4	5,583	5,078	5,254	4,225	3,990	3,968	4,292	3,565	3,832	3,316
CRYSTAL 5	5,022	5,630	5,254	3,753	3,815	4,017	3,651	3,710	3,842	2,886
<u>Steam-Coal, Total</u>	<u>14,050</u>	<u>14,417</u>	<u>14,537</u>	<u>10,208</u>	<u>10,572</u>	<u>10,828</u>	<u>11,119</u>	<u>10,326</u>	<u>10,419</u>	<u>8,520</u>
<u>Steam-Oil</u>										
ANCLOTE 1	910	1,266	1,330	1,041	1,160	1,184	1,202	1,155	1,114	915
ANCLOTE 2	1,333	1,326	1,781	1,405	1,624	1,646	1,647	1,569	1,522	1,369
SUWANNEE 1	95	91	91	85	14					
SUWANNEE 2	90	84	85	76	15					
SUWANNEE 3	233	242	240	174	42					
<u>Steam-Oil, Total</u>	<u>2,662</u>	<u>3,008</u>	<u>3,527</u>	<u>2,781</u>	<u>2,855</u>	<u>2,830</u>	<u>2,849</u>	<u>2,724</u>	<u>2,637</u>	<u>2,284</u>
<u>Steam-CC</u>										
BARTOW CC1	7,590	8,022	7,856	8,253	7,844	7,839	8,440	7,731	7,167	6,123
GEN 2x1 CC G 1								3,273	5,598	5,393
HINES 1	2,263	2,269	2,279	2,424	2,586	2,682	2,769	2,283	2,486	2,392
HINES 2	3,253	3,272	3,216	3,403	3,545	3,310	3,395	3,405	3,300	3,121
HINES 3	2,582	2,876	2,815	2,783	3,159	3,140	3,108	2,938	3,005	2,858
HINES 4	2,929	3,122	3,133	3,400	3,405	3,443	3,509	3,322	3,262	3,167
TIGERBAY 1	989	1,051	1,017	1,142	1,126	916	1,151	1,070	1,097	1,034
<u>Steam-CC, Total</u>	<u>19,606</u>	<u>20,612</u>	<u>20,316</u>	<u>21,405</u>	<u>21,667</u>	<u>21,330</u>	<u>22,372</u>	<u>24,021</u>	<u>25,915</u>	<u>24,089</u>
<u>CT, Total</u>	<u>911</u>	<u>934</u>	<u>1,086</u>	<u>619</u>	<u>862</u>	<u>1,033</u>	<u>1,220</u>	<u>1,263</u>	<u>1,048</u>	<u>671</u>
<u>Tran-Purc, Total</u>	<u>3,809</u>	<u>3,883</u>	<u>3,840</u>	<u>2,504</u>	<u>1,750</u>	<u>1,422</u>	<u>1,504</u>	<u>1,380</u>	<u>1,172</u>	<u>837</u>
<u>Cogen, Total</u>	<u>3,684</u>	<u>3,506</u>	<u>2,677</u>	<u>2,580</u>	<u>2,591</u>	<u>2,582</u>	<u>2,588</u>	<u>2,584</u>	<u>2,591</u>	<u>2,495</u>
Sales	(0)	(0)	(3)	(249)	(212)	(226)	(210)	(233)	(209)	(379)
DSM	0	0	0	0	4	3	2	3	6	2
<u>Total Load</u>	<u>44,723</u>	<u>46,360</u>	<u>47,374</u>	<u>48,120</u>	<u>47,810</u>	<u>48,073</u>	<u>48,916</u>	<u>50,338</u>	<u>51,187</u>	<u>51,993</u>

PEF-120103-EI-00095

PEF Emissions Study**2011 PEF Ten Year Site Plan (Anclote Gas Conversion)****FUEL COST \$000 (excluding gas pipe line cost)****ANNUAL**

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
CR NUC 3	0	0	9,496	57,247	53,972	62,931	57,414	69,109	64,088	74,627
NUC Future 1										53,967
<u>Nuclear, Total</u>	<u>0</u>	<u>0</u>	<u>9,496</u>	<u>57,247</u>	<u>53,972</u>	<u>62,931</u>	<u>57,414</u>	<u>69,109</u>	<u>64,088</u>	<u>128,594</u>
CRYSTAL 1	77,027	81,275	88,889	53,505	63,488	66,501	77,597	74,034	71,259	64,099
CRYSTAL 2	98,219	113,654	128,482	73,940	91,976	91,363	100,633	104,401	97,481	84,725
CRYSTAL 4	179,592	177,505	199,366	166,267	164,347	164,424	180,592	155,737	171,390	157,204
CRYSTAL 5	162,578	197,081	200,538	149,364	159,242	168,765	155,957	163,393	174,676	139,907
<u>Steam-Coal, Total</u>	<u>517,416</u>	<u>569,516</u>	<u>617,275</u>	<u>443,075</u>	<u>479,054</u>	<u>491,053</u>	<u>514,779</u>	<u>497,565</u>	<u>514,805</u>	<u>445,935</u>
ANCLOTE 1	84,782	107,943	114,273	87,603	104,693	112,829	118,558	112,323	110,102	93,295
ANCLOTE 2	115,740	126,640	151,835	112,552	145,095	155,652	159,804	142,840	139,637	127,999
SUWANNEE 1	7,238	7,436	7,686	7,721	1,365					
SUWANNEE 2	7,017	7,005	7,385	7,072	1,480					
SUWANNEE 3	15,367	17,129	17,664	13,627	3,483					
<u>Steam-Oil, Total</u>	<u>230,143</u>	<u>266,153</u>	<u>298,843</u>	<u>228,575</u>	<u>256,115</u>	<u>268,481</u>	<u>278,362</u>	<u>255,163</u>	<u>249,739</u>	<u>221,295</u>
BARTOW CC1	306,796	349,921	354,604	397,832	391,720	402,643	447,290	432,354	417,906	371,695
GEN 2x1 CC G 1								187,769	332,644	311,480
HINES 1	97,711	104,962	109,984	124,229	135,303	144,616	153,550	133,745	151,515	150,826
HINES 2	129,462	140,940	143,772	160,506	172,211	167,162	176,532	186,513	186,348	183,352
HINES 3	107,902	129,977	131,745	137,530	161,253	165,369	168,945	168,428	177,784	175,216
HINES 4	119,606	138,235	142,403	162,164	168,696	175,802	186,124	184,726	186,546	187,333
TIGERBAY 1	44,273	50,950	50,892	58,270	60,925	51,001	65,906	64,255	66,647	65,706
<u>Steam-CC, Total</u>	<u>805,750</u>	<u>914,985</u>	<u>933,400</u>	<u>1,040,530</u>	<u>1,090,109</u>	<u>1,106,593</u>	<u>1,198,347</u>	<u>1,357,790</u>	<u>1,519,389</u>	<u>1,445,607</u>
<u>CT, Total</u>	<u>62,986</u>	<u>70,639</u>	<u>92,759</u>	<u>48,521</u>	<u>83,863</u>	<u>103,017</u>	<u>123,965</u>	<u>135,330</u>	<u>110,709</u>	<u>68,382</u>
<u>Tran-Purc, Total</u>	<u>177,884</u>	<u>196,620</u>	<u>203,187</u>	<u>139,355</u>	<u>114,873</u>	<u>107,101</u>	<u>117,178</u>	<u>112,802</u>	<u>99,256</u>	<u>73,172</u>
<u>Cogen, Total</u>	<u>187,841</u>	<u>184,913</u>	<u>139,315</u>	<u>141,865</u>	<u>145,162</u>	<u>146,980</u>	<u>151,631</u>	<u>157,108</u>	<u>162,864</u>	<u>161,104</u>
<u>Fuel Cost, Total</u>	<u>1,982,020</u>	<u>2,202,826</u>	<u>2,294,276</u>	<u>2,099,169</u>	<u>2,223,147</u>	<u>2,286,156</u>	<u>2,441,676</u>	<u>2,584,868</u>	<u>2,720,850</u>	<u>2,544,088</u>

PEF-120103-EI-00096

PEF Emissions Study**2011 PEF Ten Year Site Plan (Anclote Gas Conversion)****CAPACITY FACTOR****ANNUAL**

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
CR NUC 3	-	-	100.9	100.0	93.1	100.0	90.4	100.0	91.8	100.0
NUC Future 1	-	-	-	-	-	-	-	-	-	92.8
<u>Nuclear</u>	<u>0.0</u>	<u>0.0</u>	<u>100.9</u>	<u>100.0</u>	<u>93.1</u>	<u>100.0</u>	<u>90.4</u>	<u>100.0</u>	<u>91.8</u>	<u>97.1</u>
CRYSTAL 1	45.2	46.2	49.1	28.2	33.8	36.1	41.5	38.1	34.6	30.0
CRYSTAL 2	45.0	50.6	55.8	30.1	38.1	38.3	41.9	41.6	37.0	30.8
CRYSTAL 4	89.3	81.4	84.2	67.7	63.8	63.6	68.8	57.2	61.3	53.2
CRYSTAL 5	80.5	90.5	84.5	60.3	61.2	64.6	58.7	59.6	61.6	46.4
<u>Steam-Coal</u>	<u>69.8</u>	<u>71.8</u>	<u>72.4</u>	<u>50.9</u>	<u>52.5</u>	<u>54.0</u>	<u>55.4</u>	<u>51.5</u>	<u>51.8</u>	<u>42.5</u>
ANCLOTE 1	20.7	28.4	29.7	23.3	25.8	26.4	26.9	25.8	24.8	20.4
ANCLOTE 2	29.8	29.6	39.1	30.8	35.5	36.1	36.2	34.4	33.3	30.1
SUWANNEE 1	36.2	34.6	34.5	32.3	13.1	-	-	-	-	-
SUWANNEE 2	34.3	31.9	32.4	29.0	14.0	-	-	-	-	-
SUWANNEE 3	37.4	38.8	38.5	27.9	16.2	-	-	-	-	-
<u>Steam-Oil</u>	<u>26.5</u>	<u>29.9</u>	<u>34.6</u>	<u>27.3</u>	<u>29.9</u>	<u>31.3</u>	<u>31.5</u>	<u>30.2</u>	<u>29.1</u>	<u>25.3</u>
BARTOW CC1	76.3	80.8	79.1	83.2	78.8	79.0	85.0	77.9	72.0	61.7
GEN 2x1 CC G 1	-	-	-	-	-	-	-	83.1	83.1	80.3
HINES 1	55.8	56.1	56.3	59.9	63.7	66.3	68.4	56.4	61.3	59.1
HINES 2	75.6	76.2	74.9	79.3	82.4	77.1	79.1	79.3	76.7	72.7
HINES 3	60.2	67.3	65.9	65.1	73.7	73.5	72.7	68.7	70.1	66.9
HINES 4	70.7	75.5	75.8	82.2	82.1	83.3	84.9	80.3	78.7	76.6
TIGERBAY 1	54.9	58.5	56.6	63.6	62.5	51.0	64.1	59.6	60.9	57.6
<u>Steam-CC, Total</u>	<u>68.7</u>	<u>72.4</u>	<u>71.4</u>	<u>75.2</u>	<u>75.9</u>	<u>74.9</u>	<u>78.6</u>	<u>74.1</u>	<u>73.4</u>	<u>68.5</u>
<u>CT, Total</u>	<u>4.3</u>	<u>4.4</u>	<u>5.1</u>	<u>2.9</u>	<u>4.0</u>	<u>4.8</u>	<u>5.5</u>	<u>5.5</u>	<u>4.6</u>	<u>3.1</u>
<u>Tran-Purc, Total</u>	<u>31.2</u>	<u>29.2</u>	<u>28.8</u>	<u>18.8</u>	<u>15.6</u>	<u>14.7</u>	<u>15.5</u>	<u>14.3</u>	<u>12.1</u>	<u>8.7</u>
<u>Cogen, Total</u>	<u>61.4</u>	<u>62.9</u>	<u>69.2</u>	<u>66.7</u>	<u>66.8</u>	<u>66.8</u>	<u>66.9</u>	<u>66.8</u>	<u>66.8</u>	<u>64.5</u>

PEF Emissions Study**2011 PEF Ten Year Site Plan (Anclote Gas Conversion)****TONS OF CO2****ANNUAL**

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
CRYSTAL 1	1,621,590	1,647,699	1,745,794	1,024,005	1,225,640	1,297,030	1,484,487	1,366,635	1,252,989	1,088,250
CRYSTAL 2	2,078,941	2,322,157	2,549,641	1,414,050	1,779,229	1,776,543	1,938,269	1,931,778	1,729,258	1,446,879
CRYSTAL 4	5,804,553	5,277,737	5,463,809	4,527,884	4,284,982	4,263,655	4,596,395	3,846,466	4,129,202	3,637,007
CRYSTAL 5	5,251,637	5,879,882	5,493,445	4,054,554	4,114,679	4,345,580	3,943,411	4,013,393	4,164,112	3,183,161
Steam-Coal, Total	<u>14,756,721</u>	<u>15,127,476</u>	<u>15,252,689</u>	<u>11,020,493</u>	<u>11,404,530</u>	<u>11,682,808</u>	<u>11,962,561</u>	<u>11,158,273</u>	<u>11,275,561</u>	<u>9,355,296</u>
ANCLOTE 1	684,584	858,474	889,598	710,329	780,572	797,819	808,447	783,261	758,507	628,653
ANCLOTE 2	943,826	936,319	1,121,102	897,021	1,029,582	1,043,208	1,042,959	998,493	972,474	883,442
SUWANNEE 1	75,086	71,648	71,541	67,166	11,422					
SUWANNEE 2	72,458	67,358	68,460	61,491	12,359					
SUWANNEE 3	158,204	163,952	163,107	118,266	28,842					
Steam-Oil, Total	<u>1,934,158</u>	<u>2,097,751</u>	<u>2,313,808</u>	<u>1,854,273</u>	<u>1,862,776</u>	<u>1,841,027</u>	<u>1,851,406</u>	<u>1,781,754</u>	<u>1,730,981</u>	<u>1,512,095</u>
BARTOW CC1	3,235,890	3,409,839	3,341,495	3,506,119	3,331,653	3,327,171	3,577,429	3,304,555	3,078,398	2,658,478
GEN 2x1 CC G 1								1,298,310	2,222,914	2,149,274
HINES 1	1,026,977	1,017,995	1,030,126	1,091,479	1,151,211	1,193,201	1,225,976	1,019,795	1,115,960	1,078,775
HINES 2	1,349,606	1,353,917	1,336,240	1,406,220	1,458,721	1,364,327	1,394,214	1,406,982	1,366,828	1,300,191
HINES 3	1,115,409	1,239,854	1,213,915	1,198,904	1,352,185	1,343,866	1,328,497	1,261,518	1,292,095	1,234,595
HINES 4	1,220,573	1,297,114	1,299,787	1,405,032	1,404,565	1,421,183	1,445,044	1,373,656	1,352,396	1,318,488
TIGERBAY 1	438,972	462,862	448,613	499,794	492,315	401,385	503,457	469,486	481,686	459,775
Steam-CC, Total	<u>8,387,428</u>	<u>8,781,581</u>	<u>8,670,177</u>	<u>9,107,548</u>	<u>9,190,650</u>	<u>9,051,133</u>	<u>9,474,616</u>	<u>10,134,302</u>	<u>10,910,276</u>	<u>10,199,575</u>
CT, Total	<u>602,818</u>	<u>626,529</u>	<u>750,580</u>	<u>395,075</u>	<u>596,094</u>	<u>721,399</u>	<u>842,274</u>	<u>867,235</u>	<u>706,239</u>	<u>437,773</u>
Total from Fuel	<u>25,681,125</u>	<u>26,633,336</u>	<u>26,987,254</u>	<u>22,377,388</u>	<u>23,054,049</u>	<u>23,296,367</u>	<u>24,130,857</u>	<u>23,941,564</u>	<u>24,623,057</u>	<u>21,504,738</u>
CRYSTAL 1	0	0	0	0	0	0	0	0	0	0
CRYSTAL 2	0	0	0	0	0	0	0	0	0	0
CRYSTAL 4	94,310	85,747	88,760	73,540	69,609	69,265	74,673	62,445	67,041	58,949
CRYSTAL 5	85,309	95,541	89,235	65,820	66,748	70,521	64,002	65,101	67,500	51,460
Total from Scrubber	<u>179,619</u>	<u>181,288</u>	<u>177,996</u>	<u>139,360</u>	<u>136,357</u>	<u>139,786</u>	<u>138,675</u>	<u>127,547</u>	<u>134,541</u>	<u>110,409</u>
Cogen, Total	<u>2,462,652</u>	<u>2,448,509</u>	<u>2,094,804</u>	<u>1,980,209</u>	<u>1,989,669</u>	<u>1,982,257</u>	<u>1,987,938</u>	<u>1,982,955</u>	<u>1,989,381</u>	<u>1,876,852</u>
Tran-Purc, Total	<u>2,325,030</u>	<u>2,363,233</u>	<u>2,342,598</u>	<u>1,532,282</u>	<u>1,090,960</u>	<u>887,576</u>	<u>938,896</u>	<u>862,131</u>	<u>732,265</u>	<u>523,980</u>
TOTAL	<u>30,648,425</u>	<u>31,626,366</u>	<u>31,602,652</u>	<u>26,029,238</u>	<u>26,271,035</u>	<u>26,305,986</u>	<u>27,196,366</u>	<u>26,914,197</u>	<u>27,479,243</u>	<u>24,015,979</u>

PEF-120103-EI-00098

PEF Emissions Study**2011 PEF Ten Year Site Plan (Anclote NO Gas Conversion)****PRODUCTION COST \$000****Annual**

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
Fuel										
Steam-Coal	517,416	569,807	616,922	444,063	473,638	491,367	512,658	494,678	512,115	440,214
Steam-Oil	237,756	274,357	309,716	247,338	286,590	292,512	311,363	280,831	281,770	245,020
Steam-CC	957,056	1,068,664	1,096,856	1,196,097	1,239,060	1,251,235	1,333,274	1,520,822	1,700,940	1,638,423
CT	76,309	88,489	116,019	69,257	103,517	122,321	154,775	171,517	148,153	91,598
Nuclear	0	0	10,807	65,016	61,224	70,699	64,431	76,877	71,234	149,952
Fuel Sub-Total	1,788,537	2,001,318	2,150,320	2,021,771	2,164,029	2,228,134	2,376,502	2,544,724	2,714,213	2,565,207
NH3	15,911	17,902	16,553	14,369	14,155	14,599	14,746	13,870	14,461	12,480
CaCO3	7,747	8,036	8,072	6,572	6,405	6,775	6,935	6,512	6,983	5,905
CO2	-	-	-	655,215	713,257	769,636	851,272	895,160	969,411	915,902
Pur Pwr										
Cogen	500,409	494,434	382,676	392,491	426,115	441,439	461,597	482,814	507,357	523,036
Tran-Purc	331,748	369,999	392,263	311,691	262,531	222,572	237,547	230,143	216,469	178,628
Pur Pwr Sub-Total	832,157	864,433	774,939	704,182	688,646	664,011	699,144	712,957	723,827	701,664
TOTAL	2,644,352	2,891,689	2,949,884	3,402,110	3,586,492	3,683,155	3,948,598	4,173,223	4,428,894	4,201,158

PEF Emissions Study**2011 PEF Ten Year Site Plan (Anclote Gas Conversion)****PRODUCTION COST \$000****Annual**

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
Fuel										
Steam-Coal	517,416	569,516	617,275	443,075	479,054	491,053	514,779	497,565	514,805	445,935
Steam-Oil	237,756	285,181	328,520	258,252	285,792	298,158	307,881	284,389	280,794	252,350
Steam-CC	957,056	1,065,974	1,084,421	1,191,551	1,227,989	1,235,848	1,323,058	1,513,932	1,699,474	1,625,657
CT	76,309	83,396	105,518	61,281	96,432	113,681	142,333	158,735	133,617	91,271
Nuclear	0	0	10,805	65,016	61,224	70,699	64,431	76,877	71,234	149,952
Fuel Sub-Total	1,788,537	2,004,067	2,146,540	2,019,174	2,150,491	2,209,439	2,352,483	2,531,498	2,699,926	2,565,166
NH3	15,911	17,900	16,557	14,192	14,276	14,637	14,741	13,895	14,558	12,491
CaCO3	7,747	8,036	8,085	6,475	6,489	6,803	6,926	6,519	7,047	5,913
CO2	-	-	-	650,731	709,318	762,874	843,087	888,168	961,773	912,607
Pur Pwr										
Cogen	500,409	494,184	382,339	392,933	425,761	441,974	461,788	483,250	505,892	521,942
Tran-Purc	331,748	359,702	368,956	296,232	238,219	205,268	215,073	209,822	193,427	164,006
Pur Pwr Sub-Total	832,157	853,886	751,295	689,165	663,980	647,242	676,860	693,072	699,319	685,947
TOTAL	2,644,352	2,883,889	2,922,477	3,379,737	3,544,554	3,640,995	3,894,097	4,133,153	4,382,623	4,182,123

PEF Emissions Study**2011 PEF Ten Year Site Plan (Difference)****PRODUCTION COST \$000****Annual**

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
Fuel										
Steam-Coal	0	292	-354	988	-5,415	314	-2,121	-2,888	-2,690	-5,721
Steam-Oil	0	-10,824	-18,804	-10,914	798	-5,646	3,483	-3,558	976	-7,330
Steam-CC	0	2,690	12,436	4,547	11,071	15,388	10,217	6,890	1,466	12,766
CT	0	5,093	10,500	7,976	7,085	8,639	12,441	12,781	14,535	326
Nuclear	0	0	1	0	-1	0	0	0	0	0
Fuel Sub-Total	0	-2,749	3,780	2,597	13,539	18,694	24,019	13,226	14,287	42
NH3	-	1	(3)	177	(121)	(38)	5	(25)	(98)	(10)
CaCO3	-	0	(13)	97	(85)	(28)	9	(7)	(64)	(7)
CO2	-	-	-	4,484	3,939	6,762	8,184	6,992	7,637	3,295
Pur Pwr										
Cogen	0	251	337	-442	355	-535	-190	-436	1,465	1,094
Tran-Purc	0	10,297	23,306	15,459	24,311	17,304	22,474	20,321	23,043	14,622
Pur Pwr Sub-Total	0	10,548	23,643	15,017	24,666	16,769	22,284	19,885	24,508	15,717
TOTAL	0	7,800	27,408	22,372	41,938	42,160	54,501	40,070	46,271	19,035
NPV(2012) \$	212,693,652									

PEF Emissions Study

2011 PEF Ten Year Site Plan (Anclote NO Gas Conversion)
GWh

ANNUAL	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
CR NUC 3	0	0	1,394	8,271	7,722	8,271	7,472	8,271	7,608	8,271
NUC Future 1	0	0	0	0	0	0	0	0	0	5,203
Nuclear Total	0	0	1,394	8,271	7,722	8,271	7,472	8,271	7,608	13,474
Steam-Coal										
CRYSTAL 1	1,400	1,516	1,606	865	1,104	1,186	1,339	1,197	1,161	977
CRYSTAL 2	1,954	2,198	2,434	1,263	1,642	1,693	1,768	1,801	1,588	1,271
CRYSTAL 4	5,583	5,078	5,221	4,256	3,904	3,930	4,292	3,620	3,762	3,354
CRYSTAL 5	5,022	5,630	5,261	3,837	3,796	4,024	3,687	3,647	3,811	2,821
Steam-Coal Total	14,959	14,423	14,522	10,260	10,446	10,813	11,060	10,265	10,342	8,433
Steam-Oil										
ANCLOTE 1	910	906	1,101	904	1,034	1,059	1,086	1,014	1,005	809
ANCLOTE 2	1,333	1,356	1,428	1,175	1,448	1,459	1,514	1,407	1,377	1,242
SUWANNEE 1	95	94	96	80	15					
SUWANNEE 2	80	87	93	80	16					
SUWANNEE 3	233	243	253	189	47					
Steam-Oil Total	2,662	2,776	2,971	2,427	2,660	2,618	2,812	2,421	2,382	2,051
Steam-CC										
BARTOW CC1	7,590	8,025	7,922	8,151	7,919	7,888	8,437	7,760	7,160	6,224
GEN 2x1 CC G 1										
HINES 1	2,263	2,270	2,306	2,478	2,572	2,698	2,765	2,269	2,509	2,411
HINES 2	3,253	3,273	3,213	3,380	3,550	3,306	3,374	3,410	3,300	3,106
HINES 3	2,592	2,877	2,795	2,862	3,147	3,085	3,082	2,945	2,955	2,864
HINES 4	2,509	3,122	3,134	3,406	3,363	3,451	3,478	3,301	3,251	3,148
TIGERBAY 1	989	1,054	1,019	1,137	1,141	942	1,164	1,081	1,070	1,079
Steam-CC Total	19,606	20,612	20,389	21,412	21,694	21,369	22,300	20,653	20,824	18,235
CT Total	911	1,000	1,220	893	945	1,118	1,331	1,384	1,193	892
Econpur peak	0	0	0	0	0	0	0	0	0	0
Season 30 PPA	0	0	0	0	0	0	0	0	0	0
Shady Hills	839	924	1,016	603	787	849	929	825	755	561
SOCO Franklin	1,709	1,735	1,692	1,180	309					
SOCO Scherer	585	579	562	399	159					
Vandolah (NSG)	549	797	929	535	728	812	855	791	688	437
Vandolah (Reliant)	127									
Tran-Purc Total	3,809	4,035	4,198	2,717	2,873	3,661	3,784	3,615	3,441	2,998
Cogen Total	3,684	3,506	2,673	2,580	2,590	2,877	2,583	2,573	2,593	2,495
Sales DSM	(0)	(0)	(5)	(254)	(223)	(254)	(235)	(255)	(200)	(389)
Total Load	44,723	46,360	47,374	48,129	47,810	48,973	49,916	50,338	51,197	51,993

PEF Emissions Study

2011 PEF Ten Year Site Plan (Anclote Gas Conversion)
GWh

ANNUAL	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
CR NUC 3	0	0	1,394	8,271	7,722	8,271	7,472	8,271	7,608	8,271
NUC Future 1	0	0	0	0	0	0	0	0	0	5,203
Nuclear Total	0	0	1,394	8,271	7,722	8,271	7,472	8,271	7,608	13,474
Steam-Coal										
CRYSTAL 1	1,400	1,516	1,614	925	1,114	1,187	1,363	1,251	1,130	964
CRYSTAL 2	1,954	2,191	2,415	1,304	1,853	1,906	1,813	1,800	1,605	1,334
CRYSTAL 4	5,583	5,078	5,254	4,225	3,960	3,968	4,292	3,565	3,832	3,316
CRYSTAL 5	5,022	5,630	5,254	3,703	3,815	4,017	3,651	3,710	3,942	2,886
Steam-Coal Total	14,959	14,417	14,537	10,208	10,672	10,828	11,119	10,326	10,419	8,520
Steam-Oil										
ANCLOTE 1	910	1,266	1,330	1,041	1,160	1,184	1,202	1,155	1,114	915
ANCLOTE 2	1,333	1,326	1,781	1,405	1,624	1,646	1,647	1,599	1,522	1,369
SUWANNEE 1	95	91	91	85	14					
SUWANNEE 2	80	84	85	76	15					
SUWANNEE 3	233	242	240	174	42					
Steam-Oil Total	2,662	3,068	3,527	2,791	2,855	2,830	2,849	2,724	2,631	2,284
Steam-CC										
BARTOW CC1	7,590	8,022	7,856	8,253	7,844	7,839	8,440	7,731	7,167	6,123
GEN 2x1 CC G 1										
HINES 1	2,263	2,269	2,279	2,424	2,586	2,682	2,769	2,283	2,486	2,392
HINES 2	3,253	3,272	3,216	3,403	3,545	3,310	3,365	3,406	3,300	3,121
HINES 3	2,592	2,876	2,815	2,783	3,159	3,140	3,108	2,936	3,005	2,858
HINES 4	2,509	3,122	3,133	3,400	3,406	3,443	3,509	3,322	3,262	3,167
TIGERBAY 1	989	1,051	1,017	1,142	1,126	916	1,151	1,070	1,097	1,034
Steam-CC Total	19,606	20,612	20,316	21,495	21,667	21,330	22,372	20,621	20,815	18,089
CT Total	911	924	1,085	819	862	1,032	1,220	1,263	1,048	871
Econpur peak	0	0	0	0	1					
Season 30 PPA	0	0	0	0	0	0	0	0	0	0
Shady Hills	839	855	852	524	663	739	805	722	630	469
SOCO Franklin	1,709	1,738	1,688	1,161	384					
SOCO Scherer	585	579	562	405	152					
Vandolah (NSG)	549	711	756	415	551	683	699	658	542	369
Vandolah (Reliant)	127									
Tran-Purc Total	3,809	3,883	3,849	2,504	2,780	3,422	3,504	3,380	3,172	2,927
Cogen Total	3,684	3,506	2,677	2,580	2,591	2,562	2,588	2,584	2,591	2,495
Sales DSM	(0)	(0)	(3)	(249)	(212)	(226)	(210)	(233)	(209)	(370)
Total Load	44,723	46,360	47,374	48,120	47,810	48,973	49,916	50,338	51,197	51,993

PEF Emissions Study

2011 PEF Ten Year Site Plan (Difference)
GWh

ANNUAL	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
CR NUC 3	0	0	0	0	0	0	0	0	0	0
NUC Future 1	0	0	0	0	0	0	0	0	0	0
Nuclear Total	0	0	0	0	0	0	0	0	0	0
Steam-Coal										
CRYSTAL 1	0	-1	-8	-41	-11	-22	-24	-54	22	-8
CRYSTAL 2	0	7	20	-21	-11	37	-45	1	-17	-63
CRYSTAL 4	0	0	-23	31	-86	-37	-27	55	-50	49
CRYSTAL 5	0	0	6	84	-19	7	36	-63	-31	-65
Steam-Coal Total	0	6	-9	52	-127	-14	-69	-61	-77	-87
Steam-Oil										
ANCLOTE 1	0	-270	-229	-137	-125	-125	-104	-141	-109	-106
ANCLOTE 2	0	30	-364	-230	-176	-187	-133	-162	-145	-127
SUWANNEE 1	0	3	5	5	1	0	0	0	0	0
SUWANNEE 2	0	3	8	3	1	0	0	0	0	0
SUWANNEE 3	0	2	14	15	5	0	0	0	0	0
Steam-Oil Total	0	-233	-558	-343	-295	-313	-237	-303	-255	-233
Steam-CC										
BARTOW CC1	0	3	67	-102	75	48	-2	29	-8	101
GEN 2x1 CC G 1	0	0	0	0	0	0	0	4	-19	9
HINES 1	0	1	27	54	-14	16	-4	-14	23	19
HINES 2	0	1	-3	-23	5	-4	-22	5	1	-15
HINES 3	0	0	-21	79	-11	-56	-26	7	-50	6
HINES 4	0	0	1	5	-42	8	-31	-20	-12	-19
TIGERBAY 1	0	3	2	-5	15	25	13	21	-27	45
Steam-CC Total	0	8	74	8	27	39	-72	33	-81	146
CT Total	0	66	132	74	83	85	111	121	145	21
Econpur peak	0	0	0	0	0	0	0	0	0	0
Season 30 PPA	0	0	0	0	0	-1	0	0	0	0
Shady Hills	0	70	163	79	125	110	123	102	125	92
SOCO Franklin	0	-3	24	19	15	0	0	0	0	0
SOCO Scherer	0	0	0	-6	7	0	0	0	0	0
Vandolah (NSG)	0	86	170	120	177	129	156	133	144	68
Vandolah (Reliant)	0	0	0	0	0	0	0	0	0	0
Tran-Purc Total	0	163	358	213	324	238	280	235	289	180
Cogen Total	0	0	-2	-1	-1	-3	-3	-11	4	9
Sales DSM	0	0	(2)	(5)	(11)	(27)	(25)	(21)	8	(10)
Total Load	0	0	0	0	0	0	0	0	0	0

PEF Emissions Study**2011 PEF Ten Year Site Plan (Anclote NO Gas Conversion)****FUEL COST \$000 (excluding gas pipe line cost)****ANNUAL**

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
CR NUC 3	0	0	9,498	57,247	53,971	62,931	57,414	69,109	64,088	74,627
NUC Future 1										53,967
<u>Nuclear, Total</u>	<u>0</u>	<u>0</u>	<u>9,498</u>	<u>57,247</u>	<u>53,971</u>	<u>62,931</u>	<u>57,414</u>	<u>69,109</u>	<u>64,088</u>	<u>128,594</u>
CRYSTAL 1	77,027	81,214	88,158	51,176	62,602	65,824	75,941	71,457	72,165	63,724
CRYSTAL 2	98,219	113,996	129,351	72,643	91,074	93,340	98,594	104,727	96,900	80,178
CRYSTAL 4	179,592	177,508	198,611	167,337	161,415	162,988	180,087	157,712	169,546	159,784
CRYSTAL 5	162,578	197,090	200,802	152,908	158,547	169,216	158,036	160,781	173,505	136,528
<u>Steam-Coal, Total</u>	<u>517,416</u>	<u>569,807</u>	<u>616,922</u>	<u>444,063</u>	<u>473,638</u>	<u>491,367</u>	<u>512,658</u>	<u>494,678</u>	<u>512,115</u>	<u>440,214</u>
ANCLOTE 1	84,782	101,091	119,367	92,200	116,088	123,485	132,466	118,423	118,838	96,221
ANCLOTE 2	115,740	129,773	144,246	113,427	152,270	157,600	167,629	151,432	150,127	135,994
SUWANNEE 1	7,238	7,632	8,113	8,162	1,410					
SUWANNEE 2	7,017	7,211	8,023	7,359	1,531					
SUWANNEE 3	15,367	17,226	18,541	14,763	3,865					
<u>Steam-Oil, Total</u>	<u>230,143</u>	<u>262,933</u>	<u>298,290</u>	<u>235,911</u>	<u>275,164</u>	<u>281,085</u>	<u>300,094</u>	<u>269,855</u>	<u>268,965</u>	<u>232,215</u>
BARTOW CC1	306,796	350,132	358,384	393,597	395,047	405,896	447,505	434,807	418,631	377,490
GEN 2x1 CC G 1								188,403	334,360	314,186
HINES 1	97,711	105,025	111,570	126,756	134,823	145,335	153,861	133,417	153,080	152,746
HINES 2	129,462	141,001	143,846	160,093	173,696	167,044	175,744	187,368	187,859	183,179
HINES 3	107,902	130,089	130,869	142,101	161,440	163,667	169,298	169,351	175,401	175,749
HINES 4	119,606	139,143	146,184	163,625	171,007	183,721	190,325	185,633	186,783	186,565
TIGERBAY 1	44,273	52,286	54,984	58,905	65,166	56,318	71,830	65,702	64,741	68,457
<u>Steam-CC, Total</u>	<u>805,750</u>	<u>917,675</u>	<u>945,836</u>	<u>1,045,077</u>	<u>1,101,180</u>	<u>1,121,980</u>	<u>1,208,564</u>	<u>1,364,680</u>	<u>1,520,855</u>	<u>1,458,373</u>
<u>CT, Total</u>	<u>62,986</u>	<u>75,732</u>	<u>103,259</u>	<u>56,498</u>	<u>90,948</u>	<u>111,656</u>	<u>136,406</u>	<u>148,112</u>	<u>125,244</u>	<u>68,709</u>
<u>Tran-Purc, Total</u>	<u>177,884</u>	<u>206,382</u>	<u>226,145</u>	<u>154,273</u>	<u>137,845</u>	<u>124,884</u>	<u>138,729</u>	<u>132,471</u>	<u>121,859</u>	<u>86,936</u>
<u>Cogen, Total</u>	<u>187,841</u>	<u>185,164</u>	<u>139,652</u>	<u>141,423</u>	<u>145,516</u>	<u>146,445</u>	<u>151,441</u>	<u>156,673</u>	<u>164,329</u>	<u>162,198</u>
<u>Fuel Cost, Total</u>	<u>1,982,020</u>	<u>2,217,694</u>	<u>2,339,602</u>	<u>2,134,492</u>	<u>2,278,263</u>	<u>2,340,348</u>	<u>2,505,306</u>	<u>2,635,576</u>	<u>2,777,456</u>	<u>2,577,239</u>

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PEF Emissions Study**2011 PEF Ten Year Site Plan (Anclote NO Gas Conversion)****CAPACITY FACTOR****ANNUAL**

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
CR NUC 3	-	-	100.9	100.0	93.1	100.0	90.4	100.0	91.8	100.0
NUC Future 1	-	-	-	-	-	-	-	-	-	92.8
<u>Nuclear</u>	<u>0.0</u>	<u>0.0</u>	<u>100.9</u>	<u>100.0</u>	<u>93.1</u>	<u>100.0</u>	<u>90.4</u>	<u>100.0</u>	<u>91.8</u>	<u>97.1</u>
CRYSTAL 1	45.2	46.2	48.9	26.9	33.5	35.5	40.8	36.4	35.2	29.7
CRYSTAL 2	45.0	50.8	56.3	29.6	37.8	39.1	40.9	41.6	36.6	29.4
CRYSTAL 4	89.3	81.4	83.9	68.2	62.4	63.0	68.4	58.0	60.5	53.9
CRYSTAL 5	80.5	90.5	84.6	61.7	60.9	64.7	59.3	58.6	61.1	45.4
<u>Steam-Coal</u>	<u>69.8</u>	<u>71.9</u>	<u>72.4</u>	<u>51.1</u>	<u>51.9</u>	<u>53.9</u>	<u>55.1</u>	<u>51.1</u>	<u>51.4</u>	<u>42.0</u>
ANCLOTE 1	20.7	22.7	25.1	20.6	23.5	24.1	25.0	23.1	22.8	18.4
ANCLOTE 2	29.8	30.4	32.0	26.3	32.3	32.7	33.9	31.5	30.7	27.8
SUWANNEE 1	36.2	35.6	36.6	34.3	13.7	-	-	-	-	-
SUWANNEE 2	34.3	33.0	35.3	30.3	14.6	-	-	-	-	-
SUWANNEE 3	37.4	39.1	40.8	30.3	18.1	-	-	-	-	-
<u>Steam-Oil</u>	<u>26.5</u>	<u>27.7</u>	<u>29.7</u>	<u>24.4</u>	<u>27.4</u>	<u>28.4</u>	<u>29.5</u>	<u>27.3</u>	<u>26.8</u>	<u>23.2</u>
BARTOW CC1	76.3	80.9	79.8	82.1	79.6	79.5	85.0	78.2	71.9	62.7
GEN 2x1 CC G 1	-	-	-	-	-	-	-	83.2	82.8	80.4
HINES 1	55.8	56.1	57.0	61.2	63.4	66.7	68.3	56.1	61.8	59.6
HINES 2	75.6	76.2	74.9	78.7	82.5	77.0	78.6	79.4	76.7	72.4
HINES 3	60.2	67.3	65.4	67.0	73.4	72.2	72.1	68.9	68.9	67.0
HINES 4	70.7	75.5	75.8	82.4	81.1	83.5	84.1	79.8	78.4	76.1
TIGERBAY 1	54.9	58.7	56.7	63.3	63.4	52.4	64.8	60.8	59.4	60.1
<u>Steam-CC, Total</u>	<u>68.7</u>	<u>72.4</u>	<u>71.6</u>	<u>75.2</u>	<u>76.0</u>	<u>75.1</u>	<u>78.3</u>	<u>74.2</u>	<u>73.2</u>	<u>68.9</u>
<u>CT, Total</u>	<u>4.3</u>	<u>4.7</u>	<u>5.7</u>	<u>3.3</u>	<u>4.4</u>	<u>5.2</u>	<u>6.0</u>	<u>6.1</u>	<u>5.2</u>	<u>3.2</u>
<u>Tran-Purc, Total</u>	<u>31.2</u>	<u>30.4</u>	<u>31.5</u>	<u>20.5</u>	<u>18.5</u>	<u>17.2</u>	<u>18.4</u>	<u>16.7</u>	<u>14.9</u>	<u>10.3</u>
<u>Cogen, Total</u>	<u>61.4</u>	<u>62.9</u>	<u>69.2</u>	<u>66.7</u>	<u>66.8</u>	<u>66.6</u>	<u>66.8</u>	<u>66.5</u>	<u>66.9</u>	<u>64.5</u>

PEF Emissions Study**2011 PEF Ten Year Site Plan (Anclote NO Gas Conversion)****TONS OF CO2****ANNUAL**

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
CRYSTAL 1	1,621,590	1,646,327	1,736,387	979,644	1,212,714	1,278,894	1,462,298	1,311,087	1,274,597	1,082,074
CRYSTAL 2	2,078,941	2,329,222	2,569,313	1,393,115	1,768,356	1,818,885	1,893,301	1,934,876	1,713,332	1,377,711
CRYSTAL 4	5,804,553	5,277,777	5,440,941	4,563,787	4,197,296	4,222,888	4,574,259	3,902,548	4,085,602	3,696,663
CRYSTAL 5	5,251,637	5,880,124	5,499,839	4,147,088	4,094,752	4,352,760	3,980,742	3,947,442	4,132,941	3,113,618
Steam-Coal, Total	<u>14,756,721</u>	<u>15,133,451</u>	<u>15,246,479</u>	<u>11,083,634</u>	<u>11,273,118</u>	<u>11,673,428</u>	<u>11,910,599</u>	<u>11,095,952</u>	<u>11,206,472</u>	<u>9,270,067</u>
ANCLOTE 1	684,584	752,569	837,511	681,962	783,367	810,371	848,347	785,862	776,237	618,270
ANCLOTE 2	943,826	966,022	1,023,563	834,156	1,034,041	1,050,922	1,096,527	1,023,799	1,000,000	896,230
SUWANNEE 1	75,086	73,546	75,531	71,018	11,837					
SUWANNEE 2	72,458	69,368	74,344	63,961	12,829					
SUWANNEE 3	158,204	164,891	171,534	128,144	31,996					
Steam-Oil, Total	<u>1,934,158</u>	<u>2,026,395</u>	<u>2,182,483</u>	<u>1,779,241</u>	<u>1,874,071</u>	<u>1,861,293</u>	<u>1,944,874</u>	<u>1,809,661</u>	<u>1,776,237</u>	<u>1,514,500</u>
BARTOW CC1	3,235,890	3,411,262	3,372,881	3,468,372	3,358,933	3,351,593	3,574,619	3,322,557	3,082,842	2,699,578
GEN 2x1 CC G 1								1,302,121	2,216,758	2,151,732
HINES 1	1,026,977	1,018,483	1,042,675	1,113,315	1,145,134	1,199,698	1,225,910	1,016,997	1,125,846	1,087,677
HINES 2	1,349,606	1,354,126	1,334,013	1,396,973	1,460,751	1,361,983	1,386,671	1,408,984	1,367,188	1,295,580
HINES 3	1,115,409	1,239,954	1,205,516	1,231,099	1,348,676	1,321,455	1,318,230	1,263,828	1,271,855	1,236,829
HINES 4	1,220,573	1,297,194	1,299,669	1,408,031	1,389,124	1,423,423	1,434,102	1,366,803	1,347,665	1,311,869
TIGERBAY 1	438,972	464,264	448,355	497,912	499,514	411,839	508,973	479,027	470,300	479,025
Steam-CC, Total	<u>8,387,428</u>	<u>8,785,284</u>	<u>8,703,108</u>	<u>9,115,702</u>	<u>9,202,132</u>	<u>9,069,989</u>	<u>9,448,504</u>	<u>10,160,316</u>	<u>10,882,454</u>	<u>10,262,289</u>
CT, Total	<u>602,818</u>	<u>673,795</u>	<u>843,561</u>	<u>450,846</u>	<u>653,676</u>	<u>782,914</u>	<u>923,872</u>	<u>952,859</u>	<u>807,401</u>	<u>447,317</u>
Total from Fuel	<u>25,681,125</u>	<u>26,618,925</u>	<u>26,975,631</u>	<u>22,429,422</u>	<u>23,002,997</u>	<u>23,387,623</u>	<u>24,227,850</u>	<u>24,018,787</u>	<u>24,672,564</u>	<u>21,494,173</u>
CRYSTAL 1	0	0	0	0	0	0	0	0	0	0
CRYSTAL 2	0	0	0	0	0	0	0	0	0	0
CRYSTAL 4	94,310	85,748	88,383	74,140	68,156	68,594	74,291	63,374	66,335	59,916
CRYSTAL 5	85,309	95,545	89,337	67,312	66,419	70,626	64,571	64,027	66,987	50,355
Total from Scrubber	<u>179,619</u>	<u>181,292</u>	<u>177,720</u>	<u>141,453</u>	<u>134,575</u>	<u>139,220</u>	<u>138,862</u>	<u>127,401</u>	<u>133,321</u>	<u>110,271</u>
Cogen, Total	<u>2,462,652</u>	<u>2,448,509</u>	<u>2,092,884</u>	<u>1,978,339</u>	<u>1,987,182</u>	<u>1,977,774</u>	<u>1,982,283</u>	<u>1,972,584</u>	<u>1,993,136</u>	<u>1,875,608</u>
Tran-Purc, Total	<u>2,325,030</u>	<u>2,458,228</u>	<u>2,558,776</u>	<u>1,659,385</u>	<u>1,292,152</u>	<u>1,034,535</u>	<u>1,111,378</u>	<u>1,007,288</u>	<u>898,423</u>	<u>622,626</u>
TOTAL	<u>30,648,425</u>	<u>31,706,955</u>	<u>31,805,010</u>	<u>26,208,598</u>	<u>26,416,906</u>	<u>26,539,152</u>	<u>27,460,372</u>	<u>27,126,060</u>	<u>27,697,444</u>	<u>24,102,679</u>

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TONS OF NOx - Ozone Season

Mid Gas	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<u>No Gas Conversion</u>										
Steam - Coal - Original	4,817	5,090	5,182	3,848	4,208	4,417	4,489	4,276	4,231	3,593
Anclote 1 - Revision	506	520	584	454	542	579	617	582	579	434
Anclote 2 - Revision	574	523	579	454	567	602	639	613	617	489
Suwannee 1 - Original	114	115	116	111	22					
Suwannee 2 - Original	104	106	106	101	20					
Suwannee 3 - Original	253	264	272	239	45					
Steam - CC - Original	537	542	566	545	554	555	568	595	614	565
CT - Original	347	451	710	277	496	607	649	574	560	218
	7,252	7,610	8,116	6,029	6,453	6,760	6,962	6,639	6,602	5,298
<u>Gas Conversion</u>										
Steam - Coal - Original	4,817	5,094	5,223	3,826	4,188	4,351	4,532	4,317	4,267	3,625
Anclote 1 - Revision/Original	506	1,032	1,017	773	864	920	933	852	860	669
Anclote 2 - Revision/Original	574	393	1,104	876	978	1,022	1,015	946	951	761
Suwannee 1 - Original	114	112	111	107	21					
Suwannee 2 - Original	104	103	101	96	19					
Suwannee 3 - Original	253	255	251	222	42					
Steam - CC - Original	537	541	562	544	551	558	568	596	614	562
CT - Original	347	415	625	198	505	520	562	566	478	220
	7,252	7,946	8,993	6,643	7,167	7,371	7,610	7,277	7,170	5,836
Tons of NOx	0	-336	-877	-614	-714	-611	-648	-638	-568	-539
NOX (\$/Ton)	2,145	1,222	1,101	957	823	780	634	422	169	45
	-	(411)	(966)	(588)	(588)	(476)	(411)	(269)	(96)	(24)

CPV 2012-2018 (2012\$)	(2,789.50)
CPV 2012-2018 (2011\$)	(2,613.18)
Nominal 2012-2018	(3,439.26)

High Gas	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<u>No Gas Conversion</u>										
Steam - Coal - Original	6,488	6,722	6,725	5,547	5,706	5,876	6,097	6,114	6,129	5,419
Anclote 1 - Revision	883	963	1,090	844	985	1,076	1,138	1,058	1,076	867
Anclote 2 - Revision	882	976	1,036	862	994	1,045	1,090	1,067	1,066	971
Suwannee 1 - Original	114	114	115	109	21	-	-	-	-	-
Suwannee 2 - Original	104	104	105	98	19	-	-	-	-	-
Suwannee 3 - Original	248	258	262	229	43	-	-	-	-	-
Steam - CC - Original	498	505	532	467	471	473	482	502	520	446
CT - Original	316	394	633	244	465	531	572	558	557	211
	9,533	10,036	10,497	8,399	8,704	9,001	9,379	9,298	9,348	7,914
<u>Gas Conversion</u>										
Steam - Coal - Original	6,488	6,702	6,722	5,552	5,647	5,878	6,091	6,097	6,138	5,426
Anclote 1 - Revision/Original	883	1,010	1,005	732	825	865	897	810	808	635
Anclote 2 - Revision/Original	882	428	1,129	855	984	1,031	1,042	986	981	827
Suwannee 1 - Original	114	112	110	106	21	-	-	-	-	-
Suwannee 2 - Original	104	102	100	95	19	-	-	-	-	-
Suwannee 3 - Original	248	251	249	215	41	-	-	-	-	-
Steam - CC - Original	498	506	529	465	472	472	483	507	522	451
CT - Original	316	377	596	193	498	531	564	582	495	214
Gas Conversion	9,533	9,487	10,439	8,213	8,505	8,777	9,078	8,982	8,944	7,553
	0	549	59	186	199	224	301	316	404	361
NOX (\$/Ton)	2,145	1,222	1,101	957	823	780	634	422	169	45
	-	671	65	178	164	174	191	133	68	16

CPV 2012-2018 (2012\$)	1,212.87
CPV 2012-2018 (2011\$)	\$1,136.21
Nominal 2012-2018	1,443.02

Option 1

Sell Remaining Oil

	Inventory remaining (Bbls)	WACOG \$/Bbl	Market Price - cost of removal	~Net Cost of Oil Removal	~Net Cost of Oil Removal	
Scenario 1 - Burn 25% of oil inventory by April 1 2013	146,915	\$ 84.20	\$ 58.98	\$ 2,778,500.63	\$4,740,670	High
	172,448	\$ 74.15	\$ 58.98	\$ 1,962,169.27		
Scenario 2 - Burn 50% of oil inventory by April 1 2013	146,915	\$ 84.20	\$ 58.98	\$ 1,852,333.75	\$3,160,447	Low
	172,448	\$ 74.15	\$ 58.98	\$ 1,308,112.85		
Scenario 3 - Burn 124,000 by April 1, 2013	146,915	\$ 84.20	\$ 58.98	\$ 2,141,250.67	\$3,816,868	
	172,448	\$ 74.15	\$ 58.98	\$ 1,675,617.55		

Option 2

Uneconomic Oil Burn vs. Avoided Gas Burn

	Inventory remaining (Bbls)	WACOG \$/Bbl	Gas Equivalent Price \$MMBtu	Gas Equivalent Volume (MMBtu)	Current Gas Price \$MMBtu	~Net Cost of Oil Burn
Scenario 1 - Burn 25% of oil inventory by April 1 2013	239,522	\$ 78.77	\$ 12.26	1,539,170	\$3.50	\$13,480,933
Scenario 2 - Burn 50% of oil inventory by April 1 2013	159,682	\$ 78.77	\$ 12.26	1,026,113	\$3.50	\$8,987,288
Scenario 3 - Burn 124,000 by April 1, 2013	195,363	\$ 78.77	\$ 12.26	1,255,403	\$3.50	\$10,995,536

	2012	2013
Scenario 1 - Burn 25% of oil inventory by April 1 2013	0	\$4,740.67
Scenario 2 - Burn 50% of oil inventory by April 1 2013	0	\$3,160.45
Scenario 3 - Burn 124,000 by April 1, 2013	0	\$3,816.87

CPV 2012-2018 (2012\$)	(4,441.02)	6.75%
CPV 2012-2018 (2011\$)	(4,160.31)	
Nominal 2012-2018	(4,740.67)	
CPV 2012-2018 (2012\$)	(2,960.68)	
CPV 2012-2018 (2011\$)	(2,773.54)	
Nominal 2012-2018	(3,160.45)	
CPV 2012-2018 (2012\$)	(3,575.61)	
CPV 2012-2018 (2011\$)	(3,349.60)	
Nominal 2012-2018	(3,816.87)	

Mid Gas		<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>
TOTAL FUEL COST	No Gas Conversion	1,982,020	2,217,694	2,339,602	2,134,492	2,278,263	2,340,348	2,505,306
TOTAL FUEL COST	Gas Conversion	1,982,020	2,202,826	2,294,276	2,099,169	2,223,147	2,286,156	2,441,676
CPV 2012-2018 (2012\$)		207,294.05	(0)	14,868	35,323	55,115	54,192	63,629
CPV 2012-2018 (2011\$)		194,191.37						
Nominal 2012-2018		268,453.87						

High Gas		<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>
TOTAL FUEL COST	No Gas Conversion	2,444,703	2,801,960	3,045,716	2,755,061	2,945,949	3,043,587	3,316,161
TOTAL FUEL COST	Gas Conversion	2,444,703	2,790,015	3,020,478	2,734,527	2,929,945	3,039,611	3,312,545
CPV 2012-2018 (2012\$)		11,190.68	-	11,946	20,534	16,003	3,976	3,616
CPV 2012-2018 (2011\$)		63,568.10						
Nominal 2012-2018		81,312.73						

6.75%

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<u>2019</u>	<u>2020</u>	<u>2021</u>
2,635,576	2,777,456	2,577,239
2,584,868	2,720,850	2,544,088
50,708	56,606	33,151

<u>2019</u>	<u>2020</u>	<u>2021</u>
3,568,755	3,822,114	3,521,983
3,580,418	3,824,974	3,535,562
(11,663)	(2,860)	(13,579)

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Mid or High Gas Prices	Total	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
No Gas Conversion-ESP	174,468	0	0	10,116	19,495	18,615	17,754	16,911	16,085	15,273	14,477	13,688	12,900	11,650	1,493	1,327	1,161	995	829	663	498	332	166	41
No Gas Conversion-Low Nox Gas Burners	7,334	-	0.00	494	816	779	742	707	672	638	605	572	539	452	64	56	49	42	35	28	21	14	7	2
	181,803	0	0	10,610	20,311	19,393	18,496	17,618	16,757	15,912	15,081	14,259	13,438	12,102	1,556	1,383	1,210	1,038	865	692	519	346	173	43
Gas Conversion	141,202	(0)	11,242	14,433	13,794	13,171	12,562	11,966	11,382	10,810	10,244	9,679	9,114	8,002	1,060	928	795	663	530	398	265	133	33	0
CPV 2012 (2012S)	20,908	0	(11,242)	(3,823)	6,516	6,223	5,935	5,652	5,375	5,102	4,837	4,580	4,324	4,100	496	456	415	375	335	294	254	213	140	43
Nominal	40,600																							

6.75%

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Mid Gas		<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
Variable O&M	No Gas Conversion	43,602	46,709	47,218	46,796	57,003	58,032	54,944			
Variable O&M	Gas Conversion	43,602	46,284	46,316	45,993	56,481	57,224	54,172			
CPV 2012-2018 (2012\$)		3,357	-	425	803	522	808	772	-	-	-
CPV 2012-2018 (2011\$)		3,145									
Nominal 2012-2018		4,232	-	398	660	402	583	522	-	-	-
High Gas		<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
Variable O&M	No Gas Conversion	39,461	42,661	44,188	38,662	45,911	46,864	45,698			
Variable O&M	Gas Conversion	39,461	42,436	43,647	38,154	46,498	46,682	45,295			
CPV 2012-2018 (2012\$)		1,055	-	225	509	(587)	182	403	-	-	-
CPV 2012-2018 (2011\$)		988									
Nominal 2012-2018		1,272									

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Anclote Gas Conversion vs Anclote Retrofit \$M	2011 DEC Anclote Gas Conversion Analysis Mid Gas Price CPVRR \$2012	2011 DEC Anclote Gas Conversion Analysis High Gas Price CPVRR \$2012	
Capital	20.9	20.9	Savings
Oil Removal	(3.6)	(3.6)	Additional Costs
Fuel	207.3	11.2	Savings
Gas Reservations (Fixed Gas Transportation) ²	(77.7)	(77.7)	Additional Costs
Emissions ³	14.4	27.0	Savings
Production Costs other than Fuel, Gas Reservation Charges, and Emissions	5.9	60.1	Savings
CPVRR	167.2	37.9	

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Anclote Gas Conversion vs Anclote Retrofit \$M	2011 DEC Anclote Gas Conversion Analysis Mid Gas Price Nominal \$	2011 DEC Anclote Gas Conversion Analysis High Gas Price Nominal \$	
Capital	41	41	Savings
Oil Removal	(4)	(4)	Additional Costs
Fuel	268	81	Savings
Gas Reservations (Fixed Gas Transportation) ²	(99)	(99)	Additional Costs
Emissions ³	23	35	Savings
Production Costs other than Fuel, Gas Reservation Charges, and Emissions	3	3	Savings
Nominal	233	58	

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BOILER PERFORMANCE ANALYSIS

**Progress Energy Florida
Anclore Generating Station Units 1 & 2**

September 2011

Revision 1

**Prepared for
Progress Energy Service Company, LLC**

Prepared by



Templeton, Massachusetts

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APPENDICES

Appendix 1 -- Baseline Plant Performance Data with Heavy Oil

Appendix 2 -- Boiler Model Input Data

Appendix 3 -- Boiler Performance Detailed Output Summary

Appendix 4 -- Tube Temperature Metal Temperature Profiles

Appendix 5 -- Vibration Analysis Results Tabulation

EXECUTIVE SUMMARY

The effects on the boilers of converting Ancloste Units 1 and 2 to gas firing were evaluated by Sirois Engineering & Consulting, Inc. (S E&C) under contract No. 568838 to Progress Energy Service, LLC (PE). To accomplish the technical evaluation, S E&C used the following approach common to both units, unless otherwise noted:

Basis of Evaluation

- Maintain existing Peak generator output rating under the new operating conditions with natural gas firing.
- The performance data used for establishing baseline conditions for thermodynamic modeling throughout the effective load range on Unit 2 on heavy fuel oil at ratings of 523, 392, 300 and 200 MWg, and on natural gas at 200 MWg, respectively. All of the datasets were recorded during 2011 with the Unit furnace being relatively clean. Further, the data from HVT measurements of Furnace Exit Gas temperature was used to qualify the baseline model results.
- Boiler drawings and other information used to establish the physical model parameters were obtained from the PE drawing files.
- The Flue gas Recirculation (FGR) flow rate during the respective tests was estimated as being approximately 40 percent at 100% MCR, which was used in the technical evaluation when firing oil.
- The principal model code is S E&C's proprietary model – Steam Generator Performance Evaluation Program.
- The load is at steady state conditions.
- PE has made substantial design changes to the original arrangement of the Primary Superheater (SH Front Horizontal 10" spaced Lower Assemblies) with surface reduction
- PE has done localized tube material upgrading original arrangement of the Primary Superheater (SH Front Horizontal 5" spaced Intermediate Assemblies) to protect against overheating resulting from increased furnace radiation resulting from the surface removal done in the Lower Assemblies.
- The boiler tube material evaluation for comparing the calculated mean metal temperature to the maximum allowable temperature is based on ASME Section 1 and Section 2, 2004 Edition. Comparing the calculated tube crown metal temperature to the recommended allowable oxidation temperature is based on the following tabulation;

Temperature Limit	
ASTM	Temperature -- °F
Carbon Steel, all grades	850
SA-209 T1	900
SA-213 T9	1,000
SA-213 T11	1,025
SA-213 T22	1,075
SA-213 T91	1,175
Stainless Steel, all grades	1,300

- The leakage rate calculated in the air heaters is 6.43 percent, which is considered constant throughout the load range.
- The header design temperatures applicable to this evaluation are as follows;
 - Lower Front Horizontal Inlet/Outlet -- 716°F
 - Intermediate SH Outlet -- 923°F
 - Upper Front Horizontal Inlet -- 850°F
 - Upper Front Horizontal Outlet -- 1,035°F
 - Reheater Outlet -- 1,030°F

Assumptions

- Unit 1 & 2 are considered duplicates for the purpose of this technical evaluation.
- The difference in the tube-to-tube superheater and reheater steam temperature were based on a value of 50°F was used for each section analyzed. This is linearly prorated from no imbalance at the inlet of the section. Should the temperature imbalance be significantly higher on a continuous and consistent basis then operating changes would likely be implemented to correct the condition.
- No allowance is made for transient load changes in the tube and header material selection analysis. A reasonable load ramping rate of ~5 percent per minute would likely not significantly affect the design and remaining useful life of pressure parts given that wide ranging load ramping (and the resultant period of overfiring) is generally not a requirement at Anclote.
- The motor drive for each Forced Draft Fan is rated at greater than the 4,000 hp stated in the available documentation. A resolution is pending.

Results & Conclusions

A total of ten different operational cases were established by Progress Energy based on a number of conference calls and interim information exchanges.

- The results of this technical evaluation indicate the maximum load attainable firing only natural gas is 200 MWg. This is the load point presently attainable without exceeding boiler tube design temperature limits. Above this point both pressure part and operational changes are required.
- When firing natural gas the heat rate rises proportional due to the reduction in boiler thermal efficiency. As there is virtually no attemperation in the reheater and the steam temperature profile is virtually constant the turbine cycle efficiency remains comparatively constant between fuel firing scenarios.
- The summary tabulation of the significant parameters affected by the fuel conversion on each unit, with the design changes jointly decided on and recommended is included on the following pages.

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

SIROIS ENGR. & CONSULTING, INC										
PROGRESS ENERGY – ANCLOTE UNIT #2										
FUEL CONVERSION TO NATURAL GAS -- Rev. 2										
FGR & Burner Tilt change, and PSH Surface Reduction										
	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10
ELECTRICAL LOAD MWg		523	392	300	200		523	392	300	200
APPROXIMATE BOILER RATING PERCENT OF MCR	PEAK	98.85	75	57	40	PEAK	98.85	75	57	40
BOILER/FURNACE CONDITIONS:										
FUEL TYPE	OIL	OIL	OIL	OIL	OIL	GAS	GAS	GAS	GAS	GAS
FUEL FLOW LBM/HR	282,000.00	275,748.00	217,543.00	165,751.00	114,475.00	234,045.00	215,724.00	170,172.00	131,162.00	90,561.00
COMBUSTION AIR FLOW LBM/HR	3,905,837.00	3,819,243.00	3,091,461.00	2,360,106.00	1,629,992.00	4,037,503.00	3,721,441.00	3,012,000.00	2,321,534.00	1,606,061.00
FLUE GAS FLOW(INCLUDING FGR) LBM/HR	5,444,188.00	5,323,488.00	4,242,144.00	3,334,132.00	2,664,673.00	5,168,574.00	4,370,253.00	3,716,777.00	3,188,506.00	2,375,271.00
FLUE GAS RECIRC FLOW LBM/HR	1,256,351.00	1,228,497.00	933,139.00	808,274.00	920,206.00	897,025.00	433,088.00	534,605.00	735,809.00	678,649.00
FUEL HEAT INPUT MMBTU/HR	4,875.50	4,767.40	3,761.10	2,865.68	1,979.16	5,327.70	4,910.64	3,873.72	2,985.72	2,061.48
FURNACE EXIT GAS TEMPERATURE(FEGT) F	2,184.41	2,173.00	2,122.15	2,059.11	1,869.27	2,295.75	2,315.77	2,208.26	2,133.65	1,953.94
EXCESS AIR %	3.79	3.79	6.49	6.70	6.70	3.79	3.79	6.49	6.49	6.70
BOILER EFFICIENCY %	88.40	88.51	89.07	89.68	89.69	84.48	84.61	84.94	85.43	84.83
BURNER TILT POSITION DEGREES	+8.25	+8.25	14.04	+6	+6	-10	+20	-20	-20	-19.8
FLUE GAS RECIRC PERCENT	30.00	30.00	28.20	32.00	52.75	21.00	11.00	16.80	30.00	40.00
MAIN STEAM CONDITIONS:										
FLOW LBM/HR	3,748,092.00	3,507,207.00	2,674,714.00	1,987,249.00	1,338,422.00	3,748,092.00	3,507,207.00	2,674,714.00	1,987,249.00	1,338,422.00
TEMPERATURE F	953.72	986.12	1,005.19	1,005.59	1,006.63	1,005.00	1,004.99	1,005.19	1,005.59	1,006.63
PRESSURE PSIG	2,630.00	2,415.10	2,433.15	2,384.98	2,371.63	2,630.00	2,415.10	2,433.15	2,384.98	2,371.63
BOILER DRUM DATA:										
PRESSURE PSIG	2,775.00	2,633.71	2,576.29	2,443.32	2,443.32	2,775.00	2,633.71	2,576.29	2,443.32	2,443.32
BLOWDOWN FLOW LBM/HR	3,748.00	3,507.00	2,675.00	1,987.00	1,338.00	3,748.00	3,507.00	2,675.00	1,987.00	1,338.00
FEEDWATER INLET CONDITIONS:										
TEMPERATURE F	483.00	472.20	446.15	418.52	382.85	483.00	472.20	446.15	418.52	382.85
1ST HOT REHEAT CONDITIONS:										
FLOW LBM/HR	3,333,056.00	3,203,886.00	2,428,168.00	1,811,464.00	1,222,589.00	3,423,920.00	3,127,635.00	2,383,170.00	1,770,639.00	1,192,534.00
TEMPERATURE F	999.41	1,000.00	999.39	966.90	938.46	1,000.00	1,000.00	989.95	988.47	950.23
PRESSURE PSIG	536.00	514.49	401.78	294.21	188.77	536.00	514.49	401.78	294.21	188.77
1ST COLD REHEAT CONDITIONS:										
FLOW LBM/HR	3,333,056.00	3,124,921.00	2,383,170.00	1,770,639.00	1,192,534.00	3,333,056.00	3,124,921.00	2,383,170.00	1,770,639.00	1,192,534.00
TEMPERATURE F	608.00	636.30	605.18	556.38	528.49	635.00	646.30	605.18	556.38	528.49
PRESSURE PSIG	580.00	558.49	422.78	315.21	209.77	580.00	558.49	422.78	315.21	209.77
DESUPERHEATING SPRAY FLOW:										
SUPERHEATER SPRAY LBM/HR	-	-	122,781.00	125,017.00	70,758.00	21,629.00	6,098.00	179,362.00	234,338.00	110,955.00
1ST REHEATER SPRAY LBM/HR	-	78,965.00	44,998.00	40,825.00	30,055.00	90,864.00	2,714.00	-	-	-
SUPERHEATER CIRCUIT TERMINAL TEMPERATURES										
SATURATION TEMPERATURE F										
SUPERHEATER STRINGER TUBES F	692.38	683.81	685.55	684.57	685.78	693.89	683.72	685.93	688.24	687.29
PLATEN SUPERHEATER F (716 F Design)	702.97	698.14	707.13	710.24	710.58	708.83	701.45	712.62	723.59	717.07
PRIMARY SUPERHEATER F (923 F Design)	751.57	760.07	787.55	814.75	823.36	771.90	770.79	805.30	860.73	849.39
SUPERHEATER SPRAY F (850 F Design)	751.57	760.07	746.62	750.78	766.38	767.32	769.25	742.79	732.87	756.52
FINISHING SUPERHEATER F (1,035 F Design)	953.72	986.12	1,005.19	1,005.59	1,006.63	1,005.00	1,004.99	1,005.19	1,005.59	1,006.63
1ST REHEATER CIRCUIT TERMINAL TEMPERATURES:										
REHEATER SPRAY F (655 F Design)	608.00	597.24	574.66	519.59	486.31	593.73	644.86	605.18	556.38	528.49
PRIMARY REHEATER F	763.54	757.01	759.20	761.65	752.56	744.27	766.19	754.15	775.17	765.67
REAR VERTICAL REHEATER F	783.71	777.73	774.48	790.31	779.75	764.58	783.27	767.37	802.55	790.43
FORWARD VERTICAL REHEATER F	804.10	798.71	789.87	791.68	795.97	785.23	800.79	780.59	803.85	805.51
FINISHING REHEATER F (1,030 F Design)	999.41	1,000.00	999.39	966.90	938.46	1,000.00	1,000.00	989.95	988.47	950.23
ECONOMIZER CIRCUIT TERMINAL TEMPERATURES:					5					

Sirois Engineering & Consulting, Inc.

PEF-120103-EI-00117

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

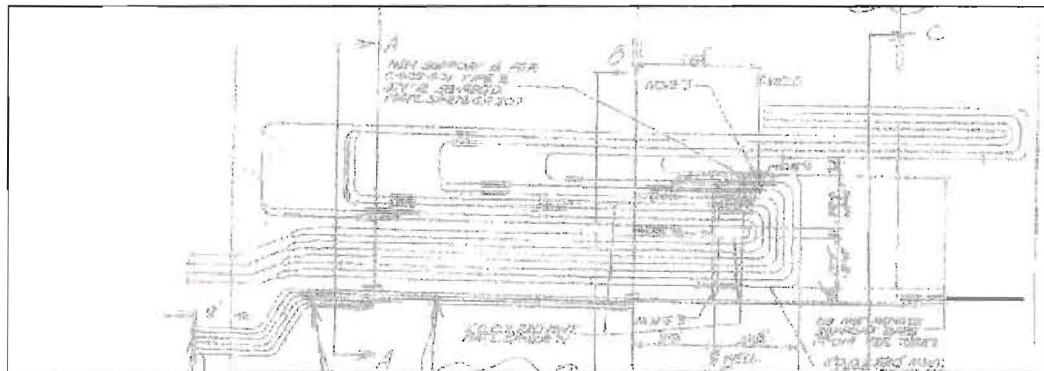
ECONOMIZER	F	522.77	514.51	490.00	449.93	441.66	520.76	509.16	487.23	453.87	442.12
ECONOMIZER STRINGER TUBES	F	541.66	534.65	503.99	491.12	462.56	541.65	529.06	502.01	500.74	463.92
<i>SUPERHEATER CIRCUIT DUTIES:</i>											
SUPERHEATER STRINGER TUBES	MMBTU/HR	162.73	161.95	128.25	106.35	77.64	182.49	160.82	127.88	113.69	79.04
PLATEN SUPERHEATER	MMBTU/HR	153.17	150.36	131.99	90.58	58.45	182.65	174.10	150.32	106.27	64.73
PRIMARY SUPERHEATER	MMBTU/HR	345.42	335.99	271.61	220.53	157.99	387.19	353.81	284.36	240.03	167.55
FINISHING SUPERHEATER	MMBTU/HR	698.24	664.65	577.79	409.27	253.73	757.94	673.19	590.51	452.23	267.92
<i>1ST REHEATER CIRCUIT DUTIES:</i>											
PRIMARY REHEATER	MMBTU/HR	308.66	304.70	254.14	242.60	173.30	312.10	219.99	199.15	210.90	148.74
REAR VERTICAL REHEATER	MMBTU/HR	38.16	37.59	20.41	27.57	17.31	39.82	30.28	17.40	25.73	15.39
FORWARD VERTICAL REHEATER	MMBTU/HR	38.53	37.99	20.45	1.61	10.40	40.37	31.10	17.35	1.50	9.44
FINISHING REHEATER	MMBTU/HR	356.21	351.86	271.68	167.01	90.35	402.59	339.93	266.45	172.14	89.59
<i>ECONOMIZER CIRCUIT DUTIES:</i>											
ECONOMIZER	MMBTU/HR	170.89	168.60	124.19	63.30	79.59	161.11	146.61	113.63	67.17	77.69
ECONOMIZER STRINGER TUBES	MMBTU/HR	84.34	83.41	40.76	85.51	29.06	92.59	81.62	41.99	92.19	29.38
<i>CONVECTIVE SECTION HEAT TRANSFER SURFACE AREAS:</i>											
PLATEN SUPERHEATER	SQFT	2,982.00	2,982.00	2,982.00	2,982.00	2,982.00	2,982.00	2,982.00	2,982.00	2,982.00	2,982.00
PRIMARY SUPERHEATER	SQFT	15,917.00	15,917.00	15,917.00	15,917.00	15,917.00	15,917.00	15,917.00	15,917.00	15,917.00	15,917.00
FINISHING SUPERHEATER	SQFT	54,301.00	54,301.00	54,301.00	54,301.00	54,301.00	54,301.00	54,301.00	54,301.00	54,301.00	54,301.00
FINISHING REHEATER	SQFT	40,974.00	40,974.00	40,974.00	40,974.00	40,974.00	40,974.00	40,974.00	40,974.00	40,974.00	40,974.00
SUPERHEATER STRINGER TUBES	SQFT	16,399.00	16,399.00	16,399.00	16,399.00	16,399.00	16,399.00	16,399.00	16,399.00	16,399.00	16,399.00
FORWARD VERTICAL REHEATER	SQFT	5,466.00	5,466.00	5,466.00	5,466.00	5,466.00	5,466.00	5,466.00	5,466.00	5,466.00	5,466.00
REAR VERTICAL REHEATER	SQFT	7,744.00	7,744.00	7,744.00	7,744.00	7,744.00	7,744.00	7,744.00	7,744.00	7,744.00	7,744.00
ECONOMIZER STRINGER TUBES	SQFT	13,393.00	13,393.00	13,393.00	13,393.00	13,393.00	13,393.00	13,393.00	13,393.00	13,393.00	13,393.00
PRIMARY REHEATER	SQFT	86,660.00	86,660.00	86,660.00	86,660.00	86,660.00	86,660.00	86,660.00	86,660.00	86,660.00	86,660.00
ECONOMIZER	SQFT	20,395.00	20,395.00	20,395.00	20,395.00	20,395.00	20,395.00	20,395.00	20,395.00	20,395.00	20,395.00
<i>FLUE GAS INLET TEMPERATURES:</i>											
PLATEN SUPERHEATER	F	2,184.41	2,173.00	2,122.15	2,059.11	1,869.27	2,295.75	2,315.77	2,208.26	2,133.65	1,953.94
PRIMARY SUPERHEATER	F	2,099.12	2,087.33	2,027.39	1,976.74	1,802.02	2,194.89	2,202.50	2,091.95	2,037.93	1,875.23
FINISHING SUPERHEATER	F	1,911.39	1,900.54	1,838.45	1,782.35	1,625.27	1,986.82	1,979.76	1,879.95	1,829.23	1,678.00
FINISHING REHEATER	F	1,492.07	1,491.82	1,389.11	1,374.39	1,303.70	1,532.91	1,501.80	1,381.34	1,381.38	1,316.11
FORWARD CAVITY	F	1,276.85	1,274.37	1,175.06	1,208.67	1,192.53	1,291.44	1,259.76	1,153.56	1,212.70	1,198.68
SUPERHEATER STRINGER TUBES	F	1,257.52	1,254.59	1,156.75	1,182.68	1,161.54	1,262.66	1,228.62	1,127.07	1,176.10	1,162.21
FORWARD VERTICAL REHEATER	F	1,163.83	1,159.25	1,060.29	1,083.50	1,073.57	1,159.89	1,121.64	1,024.57	1,073.90	1,067.43
SCREEN	F	1,139.24	1,134.43	1,043.17	1,081.22	1,059.52	1,134.00	1,097.89	1,008.65	1,071.75	1,053.72
REAR VERTICAL REHEATER	F	1,128.19	1,123.23	1,033.34	1,068.92	1,046.62	1,122.70	1,086.58	999.09	1,059.24	1,040.44
ECONOMIZER STRINGER TUBES	F	1,103.54	1,098.38	1,016.04	1,039.63	1,023.39	1,096.89	1,063.18	982.93	1,031.87	1,018.24
REAR CAVITY	F	1,054.67	1,048.92	987.62	956.51	994.61	1,045.03	1,009.24	953.15	944.75	987.91
PRIMARY REHEATER	F	1,039.82	1,033.84	972.23	938.56	968.70	1,024.19	987.53	932.21	920.70	958.61
ECONOMIZER	F	840.85	832.80	760.28	680.72	739.99	822.92	818.93	751.48	697.56	748.51
<i>AIR HEATER PERFORMANCE</i>											
<i>INLET FLUE GAS CONDITIONS:</i>											
FLOW	LBM/HR	4.19E+06	4.09E+06	3.31E+06	2.53E+06	1.74E+06	4.27E+06	3.94E+06	3.18E+06	2.45E+06	1.70E+06
TEMPERATURE		727.92	718.71	654.22	611.29	631.41	715.79	703.52	645.59	624.19	635.09
<i>OUTLET FLUE GAS CONDITIONS(UNCORRECTED)</i>											
TEMPERATURE		363.74	360.78	327.76	291.91	292.75	367.95	360.51	322.17	294.37	300.6
HEAT CAPACITY FLUE GAS	BTU/LB	0.270	0.270	0.267	0.266	0.266	0.283	0.283	0.280	0.279	0.279
<i>OUTLET FLUE GAS CONDITIONS(CORRECTED)</i>											
FLOW	LBM/HR	4.46E+06	4.36E+06	3.52E+06	2.74E+06	1.89E+06	4.55E+06	4.19E+06	3.39E+06	2.66E+06	1.84E+06
TEMPERATURE		349.13	346.48	315.29	278.58	279.47	353.95	346.9	309.87	280.53	287.39
LEAKAGE		6.431	6.431	6.431	8.367	8.367	6.431	6.431	6.431	8.367	8.367
HEAT CAPACITY OF LKG AIR	BTU/LB	0.246	0.246	0.246	0.246	0.246	0.246	0.246	0.246	0.245	0.246
HEAT CAPACITY OF FLUE GAS	BTU/LB	0.262	0.262	0.261	0.259	0.259	0.276	0.276	0.274	0.273	0.273
<i>INLET COMBUSTION AIR CONDITIONS:</i>											
FLOW	LBM/HR	3.91E+06	3.82E+06	3.09E+06	2.36E+06	1.63E+06	4.04E+06	3.72E+06	3.01E+06	2.32E+06	1.61E+06
TEMPERATURE		107.0	109.7	109.7	110.4	111.9	109.7	109.7	96.7	96.7	111.9

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

<i>OUTLET COMBUSTION AIR CONDITIONS</i>										
TEMPERATURE	531.85	526.94	486.99	477.41	501.24	529.76	523.48	483.56	489.78	510.37
HEAT CAPACITY OF COMB. AIR BTU/LB	0.248	0.248	0.248	0.247	0.248	0.248	0.248	0.247	0.247	0.248
MISCELLANEOUS		235.02	224.94	222.53	228.53	235.73	234.14	224.08	225.64	230.83
GAS DUTY BTU/HR	4.11E+08	3.95E+08	2.89E+08	2.14E+08	1.57E+08	4.21E+08	3.82E+08	2.88E+08	2.26E+08	1.59E+08
EFFECTIVENESS	0.587	0.588	0.600	0.638	0.652	0.574	0.578	0.589	0.625	0.639

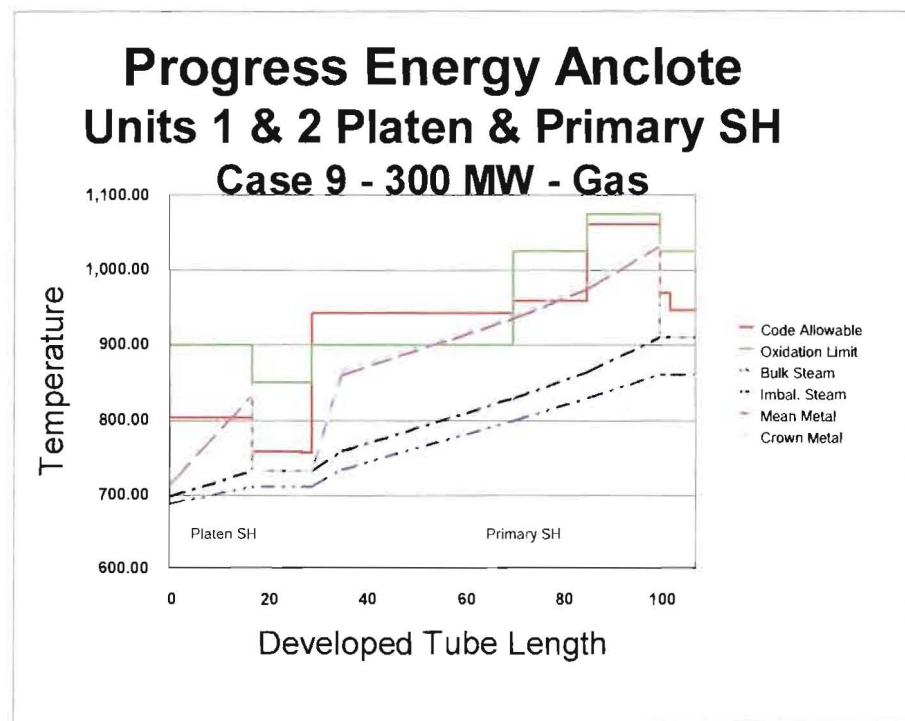
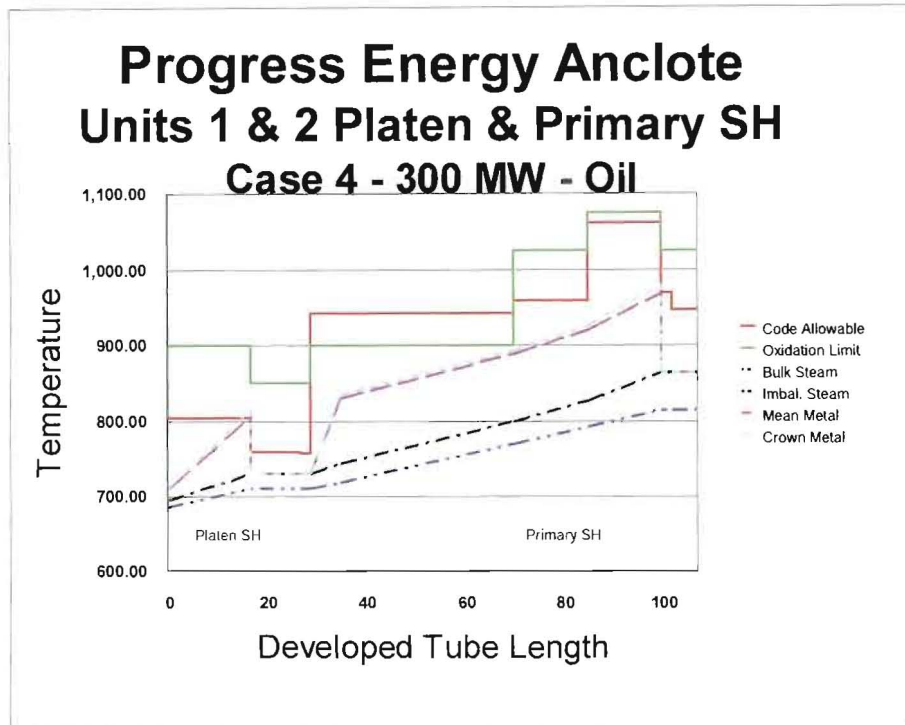
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- With the recommended pressure part changes, except for the PSH Outlet operating between 200 & 300 MW firing gas, resulting in terminal steam temperature exceeding 950°F, with a 923°F header design limit, the terminal temperatures leaving respective sections of the boiler are all within or at the stated temperature limits specified.
- The flow limit of the total main steam spray attemperation system is reported by PE as ~300kpph. This value is unconfirmed based on conversation with Plant personnel, but without superheater surface adjustments and changes to operating techniques, the predicted spray flow is >200 kpph when operating at MCR conditions firing gas.
- To maintain constant electrical rating without compromising design tube & header design temperature levels, the combination of PSH surface reduction – all of the tubing spaced at 10 inch lateral spacing, and operating adjustments as tabulated in burner tilt angle and reduced FGR were successfully used to minimize RH spray flow and maintain reasonable HP to IP steam temperature differentials that will conform the TG OEM operating limits throughout the entire load range for a tandem turbine configuration. The PSH surface adjustment concept is illustrated in the following sketch depicted in red.



PSH with Modified Surface Arrangement

- With the above PSH design change, the Unit 1 & 2 PSH tube metal temperatures slightly exceed the 2004 ASME Code temperature and oxidation temperature limits at the 300 MW firing rate – worst case load point -- with 100% natural gas in all burner elevations and using tilts controlled to -20 degrees maximum and FGR to maintain RH steam temperature to the design level. See the comparative graphed results below.



- To optimize the boiler operation with respect to preventing significant

reduction in the remaining life of the Platen and Primary Superheaters, and prevent having to do a tube material upgrade appropriate operational changes should be considered. Among the operational changes suggested for further consideration: (1) Operate with only the two or three lowest rows of burners in service, (2) Co-fire with a small fraction of fuel oil to alter the furnace heat transfer characteristics, or (3) Use the tilts to a (more than a -20 degree position) downward angle and accept a reduction in hot reheat steam temperature at this lower load level if additional FGR usage drives up the PSH outlet temperature to an excessive level.

- Based on recent experience on the fuel conversion of similar units for another utility company the physical condition of the Lower Front Horizontal Inlet/Outlet Header, which is fabricated with Carbon steel, should be checked as the entering steam temperature will rise by approximately 15°F.
- The Reheater and the Finishing Superheater are not significantly affected by the fuel change. Furthermore, the reduction in the PSH surface assists in carrying a higher Reheat steam temperature level throughout the load range.
- Should PE need to return the unit to HFO firing, there will be a decrease in main steam temperature of ~50°F at Peak load resulting from the removal of the PSH surface. Operational changes, such as use of the existing OFA ports, may be sufficient to minimize this steam temperature shortfall with a change in tilt position, excess air or FGR flow. At lower load points firing oil both main steam and hot reheat steam temperatures are expected to be controllable to their 1000/1000°F design points, but with reduced spray attenuation flow needed.
- The Unit was evaluated for the possibility of increased resonant (vonKarman vortex shedding) vibration problems in the boiler convection pass. A detailed analysis of the base MCR load case firing oil compared with firing natural gas was done. The results of the analysis indicate no significant increased vibration potential firing natural gas as tabulated in the Results section of this report. The principle reason for this is the fact that because of the need for less FGR flow when gas firing, the velocity profile throughout the Unit is lessened.
- The fuel change when operating at Peak Load is expected to increase the combustion air flow by ~3.3 percent when operating with 3.79 excess air and increase the respective pressure drop by only 1.5 percent from 40 to 40.6 iwg as the reduced flue gas flow through the boiler is offset by additional air flow in the ductwork and the air heater. Refer to **Appendix 3** for the graphical representation of the performance changes depicted on the FD curve. With the FD fan already having been tipped, it is reasonable to expect that FD fan performance is less conservative than that represented and that drive motor power requirement is higher than originally estimated. Based on the evaluation of the Forced Draft (FD) fan motor drives this could be considered a sufficient change to result in an impact on the FD fan motor

drive system with the full load amps now well above the full load amp level and operating within the Service Factor. Given the motor is operating at the limit of the Service Factor it is expected that without an upgrade the motor drive will cause a Unit derate of ~3.5 percent from the Peak Rating.

INTRODUCTION

Sirois Engineering & Consulting, Inc. (S E & C) contracted with Progress Energy Services, LLC (PE) to do a specific scope of work on Anclore Units 1 & 2 consistent with the following scope of work associated with converting these units to operation with natural gas. . S E&C was asked to perform boiler performance modeling and engineering services specifically to:

1. Increase one (or more) levels of natural gas capable burners to increase the nat. gas fired fraction higher than the present 40 percent capacity.
2. Establish the maximum load attainable on natural gas without infringing on existing design or operational limitations.
3. Determine impacts to unit heat rate
4. Determine total gas consumption at full load.

Based on the above scope, the following tasks were proposed to address the impact of combustion modifications for fuel conversion on the boiler performance, for the boiler set:

1. Develop baseline boiler performance at three load points utilizing file reference operating data provided by Progress Energy, which corresponds to the initial MCR, 75-80 percent MCR and 50-60 percent MCR load baseline conditions of the boiler firing heavy oil alone and in combination with one and two lowest burner rows firing gas; a total of nine (9) conditions evaluated.
2. Using the baseline model results, extrapolate modeling cases to include the maximum fraction of natural gas firing corresponding to load by using one or more additional burner rows converted to being gas capable. This may include gas only and or gas/oil cofiring cases as a function of load.
3. If suitable reference boiler performance is not available, a baseline test will be needed to establish an accurate, representative database for 1., above. This is an option to the base scope of work.
4. Perform an analysis of the existing superheater, header and link piping for compliance with 2004 ASME Section 1 compliance requirements. The focus will be on those sections susceptible to the effects of converting an oil fired unit to natural gas. This will confirm that surface modifications or pressure part material upgrades are not needed. The flow capacity of the spray attenuation systems will be evaluated.
5. Perform an analysis of the existing economizers. The focus will be on the conditions and remedies that could possibly result in an unacceptable steaming condition.
6. Based on file and test information, assess the combustion air FD fan system for adequacy when firing natural gas at the Full Load point.
7. Assess the potential for boiler vibration when firing natural gas. This is an option to the base scope of work.
8. If load derating or heavy RH sprays are acceptable options, a detailed steam cycle impact study may be required. This is an option to the base scope of work.

9. Prepare a report addressing the findings, conclusions and recommendations associated with this Scope of Work.

This evaluation was performed at Peak load, MCR load, and a number of lesser ratings to assess the worse case condition related to the capability of the existing units to meet performance requirements after modifying the combustion system for the fuel conversion. Low NO_x operation was not an integral part of this evaluation, but conversations with PE were held as to how the common combustion technologies applied in their future may impact boiler operation. Flue Gas Recirculation (FGR) is the most cost effective means of reducing NO_x emission levels when firing natural gas. The two most common methods of introducing FGR are; (1) Induced FGR utilizing the FD Fan as the mixing device to blend a nominal quantity (7-12 percent) flue gas into the combustion air stream and provides the motive force to supply the windbox; and (2) bulk mixed FGR which utilizes a fan to supply up to 30-35 percent FGR through mixing devices located in the hot combustion air ducting. In both cases the boiler performance and operation is affected. In all likelihood Induced FGR can be integrated without additional boiler modifications but regular FGR would require additional system changes to achieve Peak Load Rating.

For the purpose of this analysis, both boilers are considered to be of an identical design and arrangement. Further, PE has confirmed that modifications to the original PSH were done on both units.

This modeling technique and the results obtained have been qualified and confirmed with the pre-conversion predictions on a number of actual fuel conversion and NO_x reduction projects of identical design and of a similar or higher rating.

Anclote Unit 1 and 2 are duplicate Combustion Engineering (now Alstom) units each rated at 556MWe. These boilers are Assisted Circulation radiant boilers, El Paso configuration, single reheat, pressurized draft system with single furnace, tangential firing pattern with five levels of nozzles (20 burners total). They are rated with a MCR main steam flow of 3,558,662 lb/hr at a superheater outlet temperature of 1005°F at 2500 psig. Corresponding reheater steam flow at MCR is 3,172,213 lb/hr at inlet conditions of 635°F at 551 psig, and outlet conditions of 1000°F and 523 psig. Steam Temperature Control load is predicted to occur at 1,779,331 lb/hr main steam flow and 1,618,417 lb/hr RH flow. These units also have a peak load rating of 3,748,092 lb/hr main steam flow and 3,333,056 lb/hr RH flow. The units were commissioned in 1974 and 1978, respectively.

BASIS OF EVALUATION

Progress Energy was well prepared to specify and review the technical information needed to perform the boiler modeling evaluation.

As agreed to with PE project management personnel, the following guidelines were followed in executing the modeling:

- Maintain the ability to operate at Peak Rating main steam flow and the steam temperature control range under the new operating conditions.
- Although it is a low likelihood, allow for the switch back to heavy fuel firing without imposing severe operating restrictions.
- The performance data used for establishing baseline conditions for thermodynamic modeling throughout the effective load range on Unit 2 on heavy fuel oil at ratings of 523, 392, 300 and 200 MWg, and on natural gas at 200 MWg, respectively. All of the datasets were recorded during 2011 with the Unit furnace being relatively clean. If the furnace was not relatively clean the furnace heat absorption would be lower and the results of the comparative boiler performance evaluation firing natural gas would not be representative being overly conservative resulting in more extensive design changes

Further, the data from HVT measurements of Furnace Exit Gas temperature was used to qualify the baseline model results. See **Appendix 1**.

- In the dataset used to develop the baseline boiler performance model, referenced in the bullet above, a few of the parameters required for completing the modeling input data were missing and were assumed based on experience on other similar units. For example, there was no data on individual tube metal temperatures available. Therefore, reasonable assumptions were made based on previous experience on converting similar units.
- Based on discussions with Progress Energy personnel involved in this evaluation, the following tabulation of operating cases were evaluated;

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10
ELECTRICAL LOAD.....MWg		523	392	300	200		523	392	300	200
APPROXIMATE BOILER RATING, % OF MCR	PEAK	98.85	75	57	40	PEAK	98.85	75	57	40
FUEL TYPE.....	OIL	OIL	OIL	OIL	OIL	GAS	GAS	GAS	GAS	GAS

- Based on a review of the trends in boiler performance parameters compared to the 523 MW case, S E & C considers the data sets recorded at ~200 - 400 MW ratings used as being representative of accurate boiler performance firing oil, and at 200 MW firing gas. The most demanding operating conditions on the boiler is between 200 and 400 MW, which is typically the case with large tangentially fired boilers.

- Original boiler drawings and other information used to establish the physical model parameters are from PE files located at the Plant.
- The FGR rate used for steam temperature control for the baseline test is estimated at ~40 percent with heavy oil and reduced FGR quantities with natural gas to control reheat steam temperature. The FGR rate was back calculated at each load point using the HVT readings as a reference point operating throughout the load range firing oil.
- The load is at steady state conditions.
- The boiler tube material evaluation for comparing the calculated mean metal temperature to the maximum allowable temperature is based on ASME Section 1 and Section 2, 2004 Edition. Both boilers were originally designed to ASME standards in effect in 1974. During this time span, the ASME design criteria of the relatively high alloy materials in the superheater and reheater sections have allowed increasing the allowable stress by about 2.5 percent. This is a very nominal change that has no impact on the outcome of the Anclo evaluation.
- The original heating surface in the S.H. Front Intermediate Assemblies on 10" centers was partially removed (a 10 ft. section) many years ago. This design change has been confirmed by PE.
- Tube material upgrading to SA-213 T22 was done on the partial length sections exposed to furnace facing tubing has also been done in the S.H Front Intermediate Assemblies on 5" spacing when the surface removal was done in the 10" spaced section. Also tube material upgrading was done in the Platen SH located directly over the furnace
- The boiler tube material evaluation for comparing the calculated crown metal temperature to the recommended allowable oxidation temperature is based on the following tabulation;

Temperature Limit °F	
ASTM	
Carbon Steel, all grades	850
SA-209 T1	900
SA-213 T9	1,000
SA-213 T11	1,025
SA-213 T22	1,075
SA-213 T91	1,175
Stainless Steel, all grades	1,300

- The superheater and reheater steam temperature imbalance temperatures are based on estimated section data, with 50°F for all the Superheaters except the Platen Superheater and the Reheater. A value of 100°F was used in the Platen SH because of its location directly over the large furnace. S E&C's

experience is that these margins are representative of normal operation, not being overly conservative.

- Based on the baseline data at MCR firing oil, the air heater leakage was calculated as being 6.4 percent. This rate was used throughout the load range and for both fuels. Should the leakage rate be significantly higher than this value, the impact is on the Peak Load FD fan and motor drive capacity.
- The model input data for the air heater and the boiler is summarized in **Appendix 2** for the ~520MW load on Unit 2 firing heavy oil.
- The vibration analysis was calculated for all of the sections in the convection pass, comprised of the Primary and Secondary superheaters, the High Temperature and Low Temperature Reheater sections, and the Screen. The Economizer was not analyzed as it is finned surface and arranged in a staggered lattice structure, which is not conducive to vibration. Calculations were done at the inlet and outlet of the sections and the test was done for both the width and the length of the respective sections.

ASSUMPTIONS

The following assumptions are considered representative reasonable for evaluating large boiler operation and performance in the electric utility industry, and specifically the Anclore units. The information gathered from PE to perform this evaluation further supports this position.

- The electrical generator rating changes proportionately with the main steam and reheat steam flows.
- No allowance is made for transient load changes in the material selection analysis and that existing boiler metals are suitable for load changes of ~25 MW/min.
- The boiler tubes have no scale on either the outside or inside surfaces factored in the material selection analysis.
- The tube metal analysis utilized the lowest wall thickness and/or alloy in the respective sections. This results in the most conservative calculation results.
- The difference in the tube-to-tube superheater and reheater steam temperature were not reported at Anclore. Based on experience the differential temperature of 50°F was used for the PSH, FSH and RH sections analyzed. A value of 100°F was used for the Platen SH. This is linearly prorated from no imbalance at the inlet of the section.
- To maintain constant electrical rating, burner tilt and FGR are the initial means employed to maintain design steam temperature levels without incurring any RH spray attenuation throughout the load range. If these methods are not sufficient then equipment design changes are considered.
- The Primary Superheater outlet header and the link piping connection to the Finishing Superheater are designed for 923°F, based on information provided by PE.
- The excess air can be controlled to 3.79 percent on either fuel at loads exceeding 400MW. This corresponds to 0.801% excess O₂ at the economizer outlet (wet basis). Below 400 MW, the excess air is 6.49 through 6.70 percent on either fuel.
- The FD fan motor drives are reported as being 4,000 hp at 1171 rpm with a 1.15 S.F. Based on actual data, the motor drives are actually operating well within the 1.15 Service factor indicating that the tipped FD fans are routinely operated at their design limit.

RESULTS

Boiler Performance

- The Detailed Results of the boiler performance for the ten cases evaluated are included in **Appendix 3**.
- With the existing heating surface areas and arrangement, the critical point firing natural gas will occur at greater than 200 MW load, where the PSH outlet temperature will be the highest (and expected to exceed the design temperature), the main steam spray will be a near maximum.
- There is an increase in Furnace Exit Gas Temperature at a given rating when firing natural gas. This normally ranges from 100 to 200°F at high load points and is attributed to the lower boiler efficiency and reduced luminosity in the furnace with natural gas.
- The resultant increases in the gas side effectiveness results in an increase in SH spray flow rate and increases the potential for undesired RH spray flow, as indicated for the respective main steam flow conditions listed.
- The respective tube metal temperature diagrams for the Platen & Primary Superheater, Finishing Superheater, and the Primary Reheater and High Temperature Reheater, for each case with the surface adjustment made in the PSH, are included in **Appendix 4**:
 - *Platen Superheater*. The design temperature of the gas touched tubes originally fabricated with 1-5/8" diam. x 0.180" MW SA 209 T1 of 800°F. These tubes were upgraded to SA-213 T22 in 2006, which raises the allowable temperature much greater than the ~850°F expected at the Case 8 conditions (392 MW firing gas. Therefore the existing design is adequate.
 - *Primary Superheater*. The calculated tube metal temperatures of the revised PSH arrangement are all within the (acceptable) allowable range for ASME Code and Oxidation Temperature limits at the maximum Allowable Working Pressure (MAWP) under all operating conditions. The middle finishing segment of the section is expected to operate very slightly above its respective design points at the 300MW load point when firing gas. The weakest point is the SA209-T11 and the SA213-T11 outlet sections where the maximum temperature exceeds the design point by more than <50°F. For these alloys, this condition is considered marginal for long-term service and condition monitoring is required to prevent accelerated damage and shortened life.
 - *Finishing Superheater*. The calculated tube metal temperatures are all within the acceptable range for oxidation and ASME Code temperature limits at Maximum Allowable Working Pressure (MAWP) under all operating conditions. The entire section is expected to operate at or very slightly above its respective design points, at all load points when firing gas. For these alloys, this condition is considered acceptable for long-term service without incurring accelerated damage and shortened tube life.

- *Reheater (backpass and forward pass sections).* The Primary Reheater (PRH) analysis metal temperatures, using a total tube-to-tube imbalance temperature of 50°F, are all acceptable with the oxidation temperature limits under all operating conditions with heavy oil and natural gas. The weakest point is the SA213-T22 section of the Outlet section of the RH.
- *Headers and Link Piping.* Based on OEM published information the respective design points for the respective headers are;
 - Lower Front Horizontal Inlet/Outlet -- 716°F
 - Intermediate SH Outlet & Link Piping -- 923°F
 - Upper Front Horizontal Inlet -- 850°F
 - Upper Front Horizontal Outlet – 1,035°F
 - Reheater Outlet – 1,030°F

With the revised heating surface layout in the Primary SH, none of these components are expected to operate at temperature levels exceeding their respective design points under any operating condition on either gas or oil.

- The boiler performance was optimized using burner tilt positions that do not exceed minus 20 degrees so as to reduce the possibility of damaging the lower furnace components by overheating. Lowering the burner tilt position further could provide slightly more furnace temperature control at the cost of significant upgrade in lower furnace refractory and the setting. At Anclothe this added capability would be offset with a need for more FGR needed to control the main steam – hot reheat temperature differential temperature to the maximum limit usually imposed by the turbine OEM.

Spray Attenuation Systems

Based on confirming comments by PE the total SH spray attenuation flow capacity is ~300 kpph (based on flow transmitter range). This compares with a predicted total spray flow requirement of ~235 kpph under partial load conditions firing natural gas. Therefore, there is a 28 percent margin in capacity to insure the boiler operation is properly managed throughout the load range firing natural gas.

The cases were run with only a nominal amount of ‘emergency’ Reheat spray attenuation, , which results in no impact on the heat rate. Therefore, neither the flow capacity of this system nor the capacity of the boiler feedpump system is affected.

Vibration Analysis

The results of the analysis related to the resonant condition resulting from the relationship of vortex shedding frequency to the natural frequency of the gas column analysis indicates there is a low probability of a low-cycle (first or second harmonic) resonant vibration in any of the boiler convection pass sections under any operating condition firing either fuel. The reason for this is there is a relatively high percentage difference (>20 %) between the natural frequencies of the gas column in the respective sections of the boiler compared to the vortex shedding frequency that exists simultaneously with relatively high value of the Chen Number (> 2000) . Please note that there is no

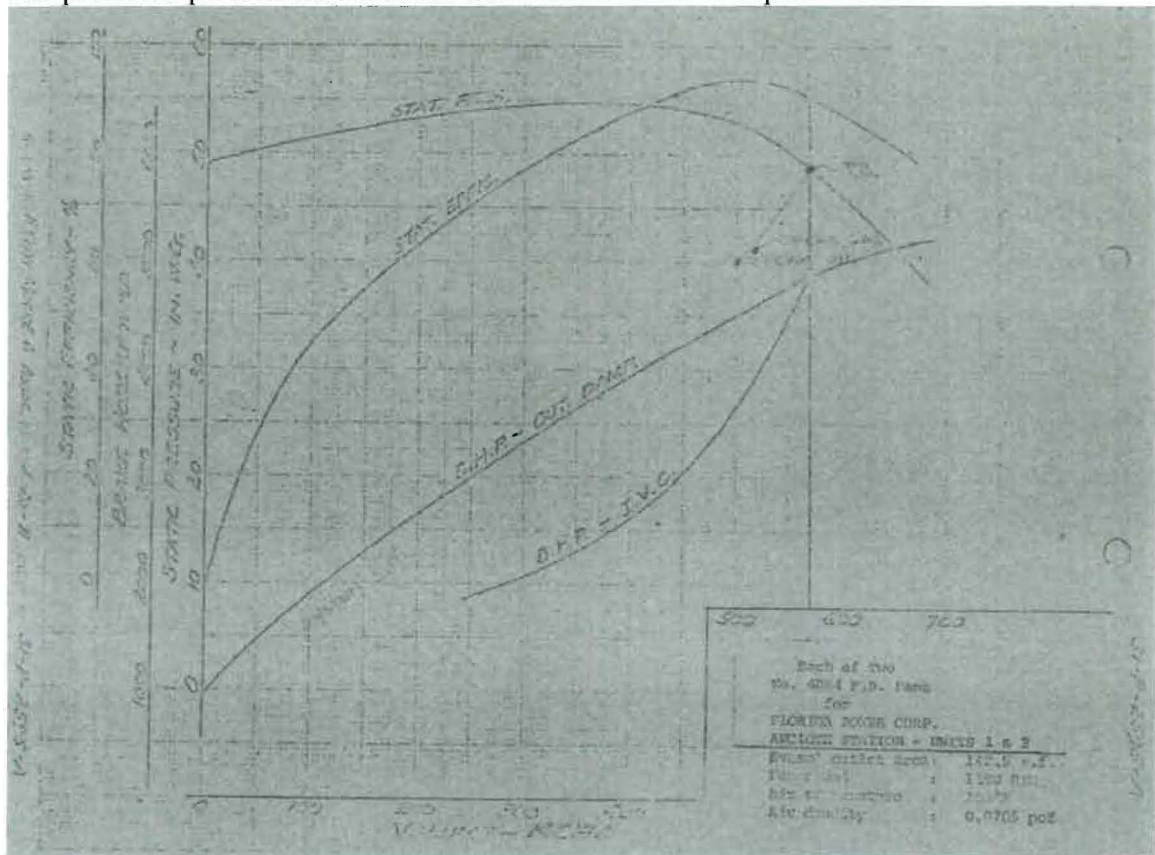
significant difference in probability of vibration problems occurring in any harmonic mode for either fuel at locations between vertical stringer tubes spans or across the Unit width. See **Appendix 5** for comparative results between oil and natural gas.

Draft Equipment Capacity

Forced Draft Fan

As the FD fan is a Westinghouse-Sturtevant backward inclined, DWDI centrifugal rated at 570 kcfm and 48 iwg with a constant speed 1190 rpm motor rated at 4,000 hp with a 1.15 Service Factor. The amperage is 502 amps. At Peak Load the flow is expected to be 512.6 kcfm at 40.59 iwg.

The predicted performance is noted on the FD Fan curve depicted below.



Based on the motor amperage readings of 553 and 574 amps, respectively, taken during the oil firing test, versus the 502 amp rating, it is expected that motor amps at peak load gas firing will exceed the redline limit even if a 15 percent service factor is allowed bringing the maximum amperage attainable to 577 amps.

Gas Recirculation Fan

As depicted on the fan curve, the FGR fan is rated at 676 kcfm and 19 iwg with a constant speed motor rated at 2,000 hp. At Peak Load firing oil the flow is expected to be

624.2 kcfm at ~12 iwg. Therefore, the fan should be adequately sized for any operating condition imposed.

Based on the motor amperage reading taken during the oil firing test 116 amps is significantly below the motor rating of 267 amps. It is expected that motor amps at peak load gas firing will be even lower than that when operating on oil. Therefore, there should be ample static pressure motor drive margin without operating in the motor service factor.

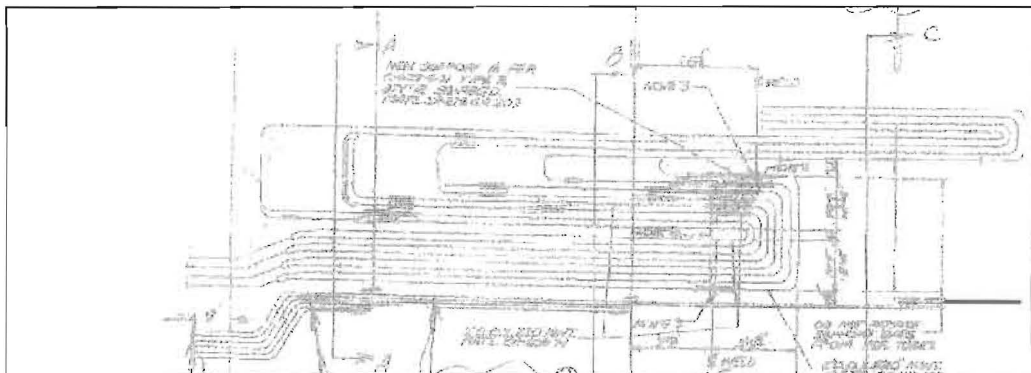
CONCLUSIONS

The following comments are based on the analyses performed; the results analyzed, and are considered suitable to establish a way forward regarding operating limits associated with converting these units to operate with either fuel oil or natural gas:

1. The boiler thermal performance analysis ranging from a lower load point of ~35 percent through to the 3,748 kpph peak rating was successfully run for both natural gas and heavy fuel oil.
2. The change in boiler efficiency and furnace heat absorption resulting from the fuel change will impose significant changes in design and operating characteristics that may affect long term boiler reliability if not addressed at the outset of conversion. The specific items are addressed in the RECOMMENDATIONS section of this report.
3. At the Peak Load rating, Ancloote Units 1 & 2 can accommodate natural gas firing without:
 - i. Exceeding the FD fan head and flow capacity limit although, the motor drive maximum amperage may be exceeded with either fuel based on the most current information received
 - ii. Incurring additional risk of boiler convection pass vibration as the FGR flow rate will be lower firing gas.
 - iii. Making material upgrades to maintain the design terminal superheat and reheat steam temperatures. Of course, this does not factor in the possible existing distress in the condition of the Horizontal/Inlet-Outlet Header (SH 5), which PE is considering evaluating.
 - iv. Jeopardizing the Primary Superheater reliability due to elevated tube metal temperature profile when compared to ASME Code allowable and oxidizing temperatures. S E&C concludes that operating with natural gas would not jeopardize the long term reliability of this section if adequate precautions are taken as described in the **Recommendations**.
 - v. Exceeding the FD fan/motor drive horsepower limit due to the additional flow or head requirement even during hot, summer conditions, if the draft system and air heater integrity is maintained. Typical items that usually affect FD system capacity include excessive air heater leakage and pluggage.
4. The critical factor affecting these boilers will be operation at approximately 50 percent MCR, where S E&C predicts that the tubing in the Primary Superheater is predicted to exceed the design terminal temperature levels by a significant margin – when firing either oil or natural gas. This situation likely cannot be managed through various operating changes.

The maximum temperature conditions will occur in the PSH at rating between 200 and 400MW, which will require removing the remaining tube assemblies spaced on 10” lateral spacing. In addition to preventing severe overheating in the PSH and the downstream piping and exceeding the spray attemperation system capacity, this modification will assist in raising the reheater steam temperature

that is now sagging. A conceptual design is depicted below; the modification (in red) includes connecting the inlet tubes being jumpered to the assemblies on 5" lateral centerlines.



PSH with Modified Surface Arrangement

5. There is an inconsistency between the reported FD fan drive motor rated horsepower and the indicated respective redline amperage. Based on calculations for the projected horsepower and amperage increases when operating at peak rating on oil or gas, the FD fan motor amps exceed the redline limit without encroaching into the motor service factor.
6. All of the Finishing Superheater and the Reheater are adequate to meet ASME Code requirements and oxidation temperature limits for any of the operating cases analyzed.
7. The PSH Outlet Header and the link piping are adequate with a design temperature of 923°F at load points. Like the PSH tube materials, operating changes are thought to be sufficient to correct this situation.
8. There is a low probability that the fuel conversion will initiate or worsen boiler vibration as the vortex shedding vibration model predicts essentially the same potential for vibration to occur throughout the convection pass sections of the boiler. Other boiler sections are not prone to resonance vibration due to the elevated temperature or the design of the tubing layout.
9. It is very unlikely that oil firing will be done after the units are converted to gas. Therefore, the usual load raising restriction due to the rapid transfer to natural gas after prolonged periods of oil firing will not occur.
10. Both the FD and FGR fans are apparently suitably sized to meet the expected performance requirements when gas is fired. However, the FD fan has been tipped, which indicates that the FD fan curve is no longer valid for the existing installation. With removal of the steam coil air heater as they are not needed when firing gas, the operating margin is improved very slightly due to the 1-1.5 iwq reduction in static head required.

RECOMMENDATIONS

- Since the convection pass pressure parts are most affected by the fuel change or increasing the FGR flow rate, a physical condition assessment of the most likely affected pressure parts through non-destructive and destructive methods (tube sampling) is recommended. On Units 1 & 2, the priority is the Primary Superheater, the Platen Superheater, then the Finishing Superheater and finally the Reheater. The Platen Superheater is particularly important since the outlet (junction header) has already posed reliability problems at other similar design boilers. It is recommended that tube temperature monitoring be done diligently.
- Modify the Primary Superheater as depicted above. The construction steps in implementing this recommendation are as follows;
 - Set up staging in the furnace to access the Platen Superheater and sections above.
 - Remove enough Platen SH tubes to gain access to the Primary Superheater above
 - Remove the Intermediate section of the Primary Superheater with tube cuts made immediately inside the furnace side of the inlet section on 10" spacing to the point where the transition to 5" spacing is made..
 - Remove the hanger clips from the stringer tubes extending upwards.
 - End prep each end of the tubes for butt welding.
 - Install the jumper tubes.
 - Replace the Platen SH tubes previously removed to gain access.
- Install spot pressure part material upgrades in the FSH to protect against damage to existing tubes from direct furnace radiation
- In addition, it may be possible to better align the main steam and reheat steam temperatures by;
 - Utilizing Burners-Out-of-Service (BOOS) techniques to alter the position of the fireball in the furnace at the lower load points.
 - Maintaining the 1,005°F hot reheat steam temperature level by manipulating the burner tilts.
 - Use a small (normally <10 percent) quantity of oil co-firing to change the furnace radiant heat transfer characteristics.
- Confirm that a vortex shedding vibration condition does not presently exist anywhere in either boiler.
- Maintain the boiler downstream components to near new condition. With the FD fan motor amperage capacity limitation, possibly due to air heater or breeching deteriorated conditions, perform a physical inspection of the air heater downstream ducting and windbox for integrity to prevent air out-leakage.

- As an initial step, remove the steam coil air heaters to reduce the SP duty on the FD fan and motor drive. An alternative could be to take a ~3.5 percent reduction in boiler Peak Rating. This should be done on a trial basis prior to upgrading the draft system.
- Insure that all of the originally installed tube temperature monitoring thermocouples are made functional to insure accurate attemperation control and that operating procedures can be optimized.
- Confirm the capacity of the SH attemperation system. Verify that the predicted maximum attemperation rate of ~300 kpph can be achieved with existing equipment.
- Inspect and correct any deficiencies in the FGR inlet and outlet damper installation to minimize FGR leakage when firing natural gas.

ANALYSIS

Boiler Performance Modeling

The primary modeling analysis was performed with a fully proven and qualified Boiler Performance Evaluation Program (BPEP). The conversion of large tangentially fired utility oil fired boilers has been successfully accomplished utilizing this Code. Among these are; the two 600 MW units at Roseton Station (was Central Hudson Electric & Gas – now Dynergy); and recently, a number of 450 MW rated units at South Coast, San Juan and Palo Seco Generating Stations for the Puerto Rico Power Authority (PREPA).

The BPEP is a PC-based, FORTRAN computer program that evaluates thermal performance of utility and industrial steam boilers. The program is used to assess changes in boiler performance afforded by variations in boiler geometric or operational characteristics. For example, changes in fuel, convection bank configuration/cleanliness, operating pressure, flue gas recirculation and steam conditions can be evaluated. In addition to thermal calculations, the program performs combustion, boiler efficiency, boiler heat balance, gas-side pressure drop, and air heater performance calculations.

Inputs to the BPEP include boiler geometric data, fuel ultimate analysis, boiler/air heater performance data, in addition to steam and flue gas stream configurations. The output includes, among other factors, boiler efficiency, furnace exit gas temperature (FEGT), and firing rate, spray flows, in addition to steam and flue gas thermodynamic conditions.

The physical boiler is first 'nodalized' into a series of discrete functional sections (e.g., furnace, convective superheater, air heater, etc.). This serves as the basis for the boiler mathematical computer model. The model is developed through execution of a series of "initialization" runs, which set certain program variables to reflect actual boiler performance. This, in essence, provides a baseline for an existing boiler, with known operating conditions. The air preheater is initialized based on combustion air and flue gas operating flow rates and temperatures. The air heater initialization run establishes thermal performance constants and leakage rates, as defined in ASME PTC-4.3.

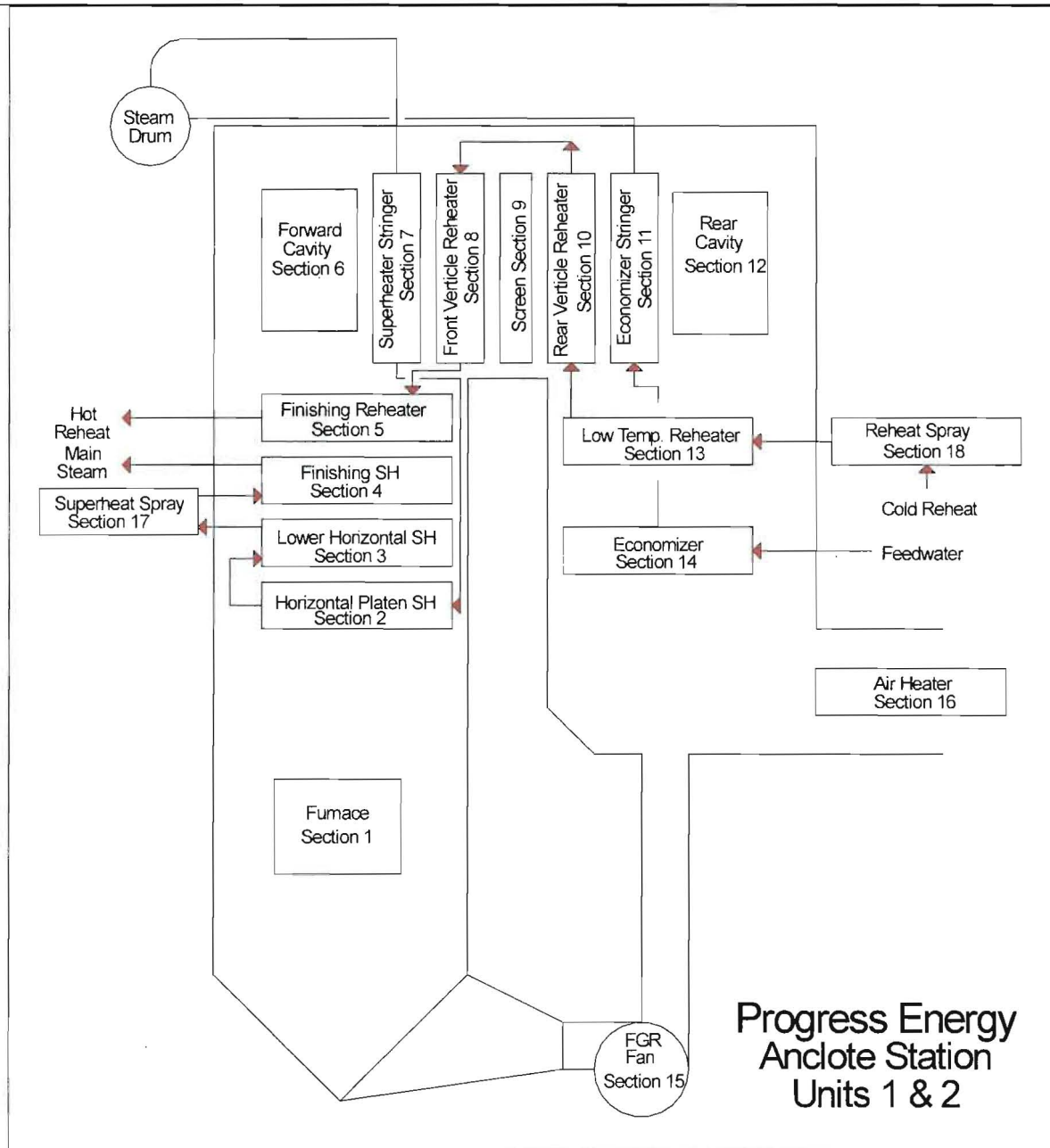
The boiler is initialized with operating data such as steam/feedwater temperatures, boiler flue gas outlet temperature, air preheater constants, excess air rate, and fuel analysis. The boiler initialization run determines the base line furnace exit gas temperature. This run also establishes convective section heat transfer coefficient adjustment factors, which tailor theoretical heat transfer calculations to reflect actual boiler performance. The variance of these parameters from 'theoretical' results indirectly provides an indication of data validity.

Following satisfactory completion of the initialization run, changes in boiler performance due to variations in operational or geometric parameters can be evaluated. The performance run was developed to assess changes whose resulting required fuel heat input is within ten percent of that of the "initialization" run.

Initialization & Base Case Model

Physical Arrangements/Nodalization

S E & C developed the nodalization diagram for Anclore Units 1 & 2 to simulate the boiler physical arrangement in the computer model. The Boiler General Arrangement Drawings were the basis of the respective diagrams:



Unit 1 & 2 Boiler Initialization Diagram

The fuel that was used throughout the initialization was the base fuel as described below:

Fuel Analysis		
	Nat. Gas	Heavy Oil
HHV, Btu/lb	22,763.52	17,289
% H ₂ O & C ₂ O	3.74	4.10
% C	71.83	85.7
% H ₂	23.81	9.54
% N ₂	0.63	0.27
% Cl	0.00	0.00
% S	0.00	1.34
% Ash	0.00	0.00
% O ₂	0.00	0.00

Air Preheater Initialization

The air preheater model used actual flue gas and combustion flow rates and temperatures to determine the air heater leakage and air heater's operating parameters for insertion into the boiler model, based on the definitions and equations of ASME PTC-4.3. The performance of the air heater is difficult to define because the leakage through the boiler setting cannot be measured; therefore, the flue gas flow only can be estimated. Based on S E & C's experience and the data from PREPA, the air leakage to the flue gas side was determined to be ~6.431 percent, which is considered low.

Boiler Initialization

Once the air preheater is defined, the remainder of the boiler can be initialized. With the physical arrangement of the boiler defined, the model was initialized based on the performance data used for establishing baseline conditions on Unit 2 is a combination of values from the 200-523 MWg load point on heavy oil fuel. The HVT test data was very useful in back calculation of the the actual FGR flow rate at various load points.

The initialization process provides displays how closely the computer model correlates with actual performance. For example, in the convective pass, the model uses actual measured steam/water temperatures and flow rates as inputs and calculates the overall heat transfer adjustment factor (UAF) for each convective section. The UAF for each convective section is defined as:

$$\text{UAF} = \frac{\text{Actual Heat Transfer}}{\text{Theoretical Heat Transfer}}$$

Where, the theoretical heat transfer is calculated by the program based on ideal or perfect heat transfer, and the actual heat transfer is based on the steam/water conditions from actual tested performance. The boiler designer decides on the factor's acceptability based on experience.

The UAF's for each convective heat transfer section are as follows:

Section	UAF— Heavy Oil
Superheater Stringer Tubes	2.827
Platen Superheater	2.706
Primary Superheater	1.195
Finishing Superheater	1.117
Finishing Reheater	1.355
Rear Vertical Reheater	0.759
Front Vertical Reheater	0.994
Primary Reheater	1.112
Economizer	0.763
Economizer Stringer Tubes	0.499

These values for UAF are considered acceptable as representative and appropriate for the analysis. From the above discussion, the initialization of the convective pass is in line with the expected performance.

Base Case Model

With the heat transfer characteristics of the boiler defined, S E & C now ran the performance model using the performance conditions as extracted from the respective baseline test information tests. The base case model for each load point served as a basis for all of the verification cases firing natural gas.

With the heat transfer characteristics defined, S E & C now ran the performance model using the performance test conditions for each of the operating conditions with estimated FGR and a near constant value for excess air. This tabulation is summarized in the **Results** section of this report.

Natural Gas Case

Once all of this information was defined, S E & C developed other operating conditions to establish the impact on steam temperatures and spray flow rates. This included cases at Low, Mid, High, MCR and Peak Load ratings on each fuel.

The Primary, Secondary Superheater and the Reheater tube temperature profiles for these cases were then developed to assess against current ASME Code allowable temperatures and Oxidation limits. These are depicted in **Appendix 4**.

The Primary Superheater is the most susceptible section of the unit to the effects of increased convective heat transfer. The convective *external* heat transfer coefficient increases simultaneously with increased attemperation flow (which tends to reduce the steam mass flow in this section) resulting in a reduced *internal* heat transfer coefficient. The temperature profiles in the Finishing Superheater and Reheater are not as sensitive to these effects.

Vibration Analysis

Vibration and noise is an infrequent problem in the operation of conventional industrial and utility boilers. Although there are a number of causes for the problems resulting from vibration in both the furnace and the convection pass of a specific boiler, the most common type of problem occurs in the convection pass and is commonly known as “vortex shedding vibration”. It is a phenomenon that results in a resonant condition when the frequency, at which the small eddy current of flue gas trailing the tubes over which it flows is nearly the same as the natural frequency of the flue gas at that location-- within 20%, a resonant condition can occur. The probability of a resonant condition is also dependent on the value of the “Chen Number”, a qualitative estimate of the excitation level energy provided by the flow. If it is over 2,000 there is some likelihood of resonant vibration of the gas column.

The natural frequency is dependent on flue gas characteristics and the dimensions of the enclosure. Depending on whether this frequency is a low or high frequency will determine if physical movement of the enclosing walls or a noise of some pitch occurs. For Progress Energy, calculations indicate that there is no increased likelihood of a harmonic resonant condition existing in the convection pass under the Peak Load case evaluated.

Correcting this type of vibration problem, should it occur, is relatively simple by installing baffles that will effectively change the dimensions of the enclosure and thus change the natural frequency of the flue gas and eliminate the problem.

APPENDIX 1

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2				100 % OIL			Gas Only Operation	
				100% MCR	40% MCR	Low Load	40% MCR	Low Load
	Start	7/19/2011 12:00		1/13/2011 18:30	1/13/2011 14:00		5/22/2011 16:00	5/22/2011 4:00
	End	7/19/2011 14:00		1/13/2011 19:30	1/13/2011 16:00		5/22/2011 18:00	5/22/2011 6:00
							Connection to the server lost. [-10723] PINET: No Connection.	
	ANC02_2TGG100XT	U2 GROSS GENERATION 0-1 MA	MW	519.9462023	203.9964497	80.59306098		74.86497233
	ANC02_NET POWER OUT	UNIT2 NET POWER OUT	MW	519.8825757	204.0069094	80.61735243	198.0855183	74.84942844
	ANC02_2FOJ308XGJ	U2 TOTAL #6 OIL FLOW	GPM	548.1068239	217.9004148	104.0768903	73.17778952	72.44244134
	ANC02_2NGJ306XGJ	U2 TOTAL FUEL GAS FLOW	KSCFH	0	0	0	2018.846218	967.5468888
Feedwater to Economizer	ANC02_2BFB305XFT1	U2 FEEDWTR ECON INLT FLOW 1	KLB/HR	3404.880109	1245.143897	505.0038311	1183.71904	491.4438367
	ANC02_2BFB305XFT2	U2 FEEDWTR ECON INLT FLOW 2	KLB/HR	3394.228545	1237.625324	471.3140044	1165.327018	459.1851938
Main Steam	ANC02_2MSB227TAI	U2 TOTAL STEAM FLOW	KLB/HR	3354.974457	1223.137515	508.7595968	1226.510624	497.1675185
SH Desuperheater Spray	ANC02_2BFB301XFT	U2 SUPERHEAT SPRAY FLOW	KLB/HR	142.4181218	59.49040909	40.61292401	112.9359235	41.72090292
RH Desuperheater Spray	ANC02_2BFB302XFT	U2 REHEAT SPRAY FLOW	KLB/HR	0	0	0	0	0
Auxiliary Steam Extractions	ANC02_2AST324XFK	U2 AUXILIARY STEAM FLOW	KLB/HR	0	0	0	0	0
Sootblowing Steam Extractions*								
Blowdown*								
	ANC02_2MSJ301XGJ	U2 STEAM FLOW	KLB/HR	3507.207049	1317.110682	570.3264317	1325.530193	558.4385725
Reheat Steam (calculated)								
RH Desuperheater Spray (calculated by heat balance)	ANC02_2BFB302XFT	U2 REHEAT SPRAY FLOW	KLB/HR	0	0	0	0	0
Throttle	ANC02_2MSJ010XPKS	TURB 2 THROTTLE PRESS SELECTED	PSIG	2299.416375	2397.529187	2102.957127	2199.579565	2066.410592
SH Outlet	ANC02_2MSB169XPT	MAIN STEAM AT BOILER 2 PRESS	PSIG	2295.137153	2416.461423	2109.163899	2151.518545	2040.066328
Drum	ANC02_2BDJ011XPKS	U2 DRUM PRESSURESELECTED	PSIG	2633.715798	2442.815742	2111.635624	2245.896378	2076.425902
Feedwater to Economizer	ANC02_2BFB108XPT	U2 ECONOMIZER INLET PRESS	PSIG	2703.202365	2496.859623	2156.944809	2293.20125	2126.041538
RH Outlet	ANC02_2MSB171XPT	RH OUTLET 2B SIDE PRESS	PSIG	511.3641883	180.6472192	74.33360095	181.4939011	72.99509197
RH Inlet (Cold RH)	ANC02_2MST609XPK	TURB 2 COLD REHEAT PRESS	PSIG	558.491514	207.8421063	95.04805006	208.3100743	93.02326607
Main Steam / SH Outlet	ANC02_2BFB302XFT	U2 REHEAT SPRAY FLOW	KLB/HR	0	0	0	0	0
Horizontal SH Finishing Sections Inlets (SH Desuperheater Outlet)	ANC02_2MSJ066XTE	2A SH DESUP OUT TMP	DEG F	803.7282185	833.6571646	833.5282298	816.864622	825.5820522
	ANC02_2MSJ063XTE	2B SH DESUP OUT TMP	DEG F	817.6121622	847.6951175	845.7994906	830.8184731	841.613528
Horizontal SH Finishing Sections Outlet	ANC02_2MSJ004XTE	2A FINAL SH OUT STM TEMP	DEG F	1004.994676	1006.31499	985.5600978	1005.085619	983.840155
	ANC02_2MSJ063XTE	2B SH DESUP OUT TMP	DEG F	817.6121622	847.6951175	845.7994906	830.8184731	841.613528
Low Temp Horizontal SH Outlet (SH Desuperheater Inlet)	ANC02_2MSB124XTE	SH INLET DESUPHTR 2A TE	DEG F	848.575254	890.1129703	925.7506615	950.0915504	927.2352046
	ANC02_2MSB125XTE	SH INLET DESUPHTR 2B TE	DEG F	867.3707894	909.8419676	933.5230637	959.7490274	953.9016281

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

SH Low Temperature Horizontal Inlet	ANCO2_2BGB413XTE	U2 SH F.H. INLT HDR ROW V PNL 9	DEG F	697.7316455	699.8388235	705.1633913	698.2161619	708.3192824
	ANCO2_2BGB415XTE	U2 SH F.H. INLT HDR ROW V PNL 23	DEG F	704.6865603	708.4427864	722.9700076	710.3419547	727.6355828
	ANCO2_2BGB418XTE	U2 SH F.H. INLT HDR ROW V PNL 37	DEG F	697.5951786	705.1893032	712.2626981	707.9136233	718.0532717
	ANCO2_2BGB420XTE	U2 SH F.H. INLT HDR ROW V PNL 51	DEG F	75.7965188	78.27459153	77.24175811	75.73656317	76.23704955
	ANCO2_2BGB428XTE	U2 SH F.H. INLT HDR ROW V PNL 65	DEG F	697.4626215	707.4766874	722.198753	710.8407619	724.0481165
	ANCO2_2BGB430XTE	U2 SH F.H. INLT HDR ROW V PNL 79	DEG F	692.9800193	699.2343496	707.1639113	703.0715151	710.423464
	ANCO2_2BGB433XTE	U2 SH F.H. INLT HDR ROW V PNL 93	DEG F	75.83358846	78.55850574	77.62022469	75.74325244	76.24864636
	ANCO2_2BGB435XTE	U2 SH FH INLT HDR ROW V PNL 107	DEG F	76.62225969	79.58183608	78.63291142	76.58230319	77.1293864
Horizontal RH Furnace Outlet (RH Outlet)	ANCO2_2MSJ041XTE	2B FINAL RH OUTLET TEMP	DEG F	989.5737348	919.9034499	940.532951	903.2798518	931.8828386
	ANCO2_2MSJ042XTE	2A FINAL RH OUTLET TEMP	DEG F	1004.440014	922.9893503	937.0786793	906.5525612	932.4646044
Horizontal RH Backpass Inlet (RH Desuperheater Outlet)	ANCO2_2MSB131XTE	2A REHEAT DESUPHTR TEMP	DEG F	646.4718387	526.9780005	580.2150754	543.1231304	579.2092156
	ANCO2_2MSB132XTE	2B REHEAT DESUPHTR TEMP	DEG F	646.1290402	527.3610385	581.2876928	541.2659182	576.773377
RH Desuperheater Inlet (Cold RH at turbine) Permanent and temporary thermocouples (SH & RH)	ANCO2_2MST303XTK	TURB 2 COLD RH OUTLET AVG TEMP	DEG F	656.3525959	537.7003864	593.5140133	553.0480451	590.17552
	ANCO2_2BGB121XTE	U2 SH HDR 9 ROW H TUBE 2 TEMP	DEG F	1029.614591	996.4026347	959.5063647	981.6579562	950.5814389
	ANCO2_2BGB122XTE	U2 SH HDR 9 ROW H TUBE 9 TEMP	DEG F	864.7998921	913.5233755	878.2584765	534.4763825	-33.56456109
	ANCO2_2BGB123XTE	U2 SH HDR 9 ROW H TUBE 16 TEMP	DEG F	-98963.39513	-98810.95466	-98850.72397	-98972.66177	-98937.53642
	ANCO2_2BGB220XTE	U2 SH HDR 9 ROW H TUBE 23 TEMP	DEG F	1029.774703	1014.385749	996.3212798	1014.941781	990.3836448
	ANCO2_2BGB221XTE	U2 SH HDR 9 ROW H TUBE 37 TEMP	DEG F	1004.7152	1014.58555	996.6351011	1012.842582	990.5103505
	ANCO2_2BGB223XTE	U2 SH HDR 9 ROW H TUBE 80 TEMP	DEG F	1005.294808	1006.5371	992.7762154	1007.342955	988.2344922
	ANCO2_2BGB224XTE	U2 SH HDR 9 ROW H TUBE 51 TEMP	DEG F	1004.983718	1022.995968	1001.477306	1018.28674	998.9978631
	ANCO2_2BGB226XTE	U2 SH HDR 9 ROW H TUBE 115 TEMP	DEG F	1012.490072	980.5606978	942.1420269	964.0010757	923.7452481
	ANCO2_2BGB412XTE	U2 SH/RH SUPPORT18 TUBE 1 TEMP	DEG F	674.9168742	666.8532248	651.728122	655.1596035	649.495808
	ANCO2_2BGB414XTE	U2 SH/RH SUPPORT18 TUBE 3 TEMP	DEG F	138.3561496	94.82834517	95.28104529	133.6000622	124.0694983
	ANCO2_2BGB416XTE	U2 SH/RH SUPPORT18 TUBE 5 TEMP	DEG F	675.4264668	667.1351815	653.7375313	655.6848057	651.7571594
	ANCO2_2BGB417XTE	U2 SH/RH SUPPORT38 TUBE 1 TEMP	DEG F	672.7884843	665.0649985	647.2918092	653.0298126	644.8392849
	ANCO2_2BGB419XTE	U2 SH/RH SUPPORT38 TUBE 3 TEMP	DEG F	-98910.81014	-98777.55331	-98817.08127	-98902	-98894.91575
	ANCO2_2BGB421XTE	U2 SH/RH SUPPORT38 TUBE 5 TEMP	DEG F	668.3735156	659.9096613	641.1616957	647.521335	638.7260658
	ANCO2_2BGB422XTE	U2 SH/RH SUPPORTS8 TUBE 1 TEMP	DEG F	670.8650342	663.0903291	644.0279369	650.9209904	641.4672018
	ANCO2_2BGB423XTE	U2 SH/RH SUPPORTS8 TUBE 2 TEMP	DEG F	671.4050763	663.4891877	644.485649	651.3109788	642.0498952
	ANCO2_2BGB424XTE	U2 SH/RH SUPPORTS8 TUBE 3 TEMP	DEG F	671.6628127	663.7251228	644.5834294	651.391945	642.0951604
	ANCO2_2BGB425XTE	U2 SH/RH SUPPORTS8 TUBE 4 TEMP	DEG F	656.7855362	648.8074791	628.5922943	635.6249534	625.6305138

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ANCO2_2BGB426XTE	U2 SH/RH SUPPORT58 TUBE 5 TEMP	DEG F	671.291859	663.1548554	644.141995	651.0717284	641.7021983
ANCO2_2BGB427XTE	U2 SH/RH SUPPORT78 TUBE 1 TEMP	DEG F	-98651.79399	-98542.23533	-98583.15557	-98688.76722	-98651.46528
ANCO2_2BGB429XTE	U2 SH/RH SUPPORT78 TUBE 3 TEMP	DEG F	672.4174559	664.6423253	647.5953777	652.6677664	645.4280295
ANCO2_2BGB431XTE	U2 SH/RH SUPPORT78 TUBE 5 TEMP	DEG F	671.4691266	663.7252245	645.7827092	651.5528459	643.3908133
ANCO2_2BGB432XTE	U2 SH/RH SUPPORT98 TUBE 1 TEMP	DEG F	-97602	-97602	-97602	-97602	-97602
ANCO2_2BGB434XTE	U2 SH/RH SUPPORT98 TUBE 3 TEMP	DEG F	648.9680701	640.616246	625.8970851	627.5464222	623.0204465
ANCO2_2BGB436XTE	U2 SH/RH SUPPORT98 TUBE 5 TEMP	DEG F	673.5348993	664.9439004	651.6020405	653.635559	649.4087795
ANCO2_2BGB467XTE	U2 HOT SH ROW H TUBE 29 TEMP	DEG F	856.6641975	805.9018472	787.0480592	804.0737376	784.6923493
ANCO2_2BGB468XTE	U2 HOT SH ROW J TUBE 29 TEMP	DEG F	1014.742817	1012.503351	994.4207117	1012.421547	987.7726241
ANCO2_2BGB469XTE	U2 HOT SH ROW K TUBE 29 TEMP	DEG F	1002.395024	992.4538147	976.2635946	990.9788462	970.520544
ANCO2_2BGB471XTE	U2 HOT SH ROW H TUBE 58 TEMP	DEG F	966.7177042	1009.211454	993.3658736	1001.810114	993.4023408
ANCO2_2BGB472XTE	U2 HOT SH ROW J TUBE 58 TEMP	DEG F	998.104537	992.2381119	983.9779893	994.0645762	979.1739172
ANCO2_2BGB473XTE	U2 HOT SH ROW K TUBE 58 TEMP	DEG F	964.206877	999.6186832	990.0543888	996.2126585	991.6427669
ANCO2_2BGB475XTE	U2 HOT SH ROW H TUBE 87 TEMP	DEG F	1002.960434	999.062734	989.3445055	1000.848938	983.1503354
ANCO2_2BGB476XTE	U2 HOT SH ROW J TUBE 87 TEMP	DEG F	-98105.6914	-97981.35049	-98018.55136	-98122.8047	-98086.15298
ANCO2_2BGB477XTE	U2 HOT SH ROW K TUBE 87 TEMP	DEG F	990.9269137	985.6051579	977.3816792	987.0917051	969.1106606
ANCO2_2BGB478XTE	U2 HOT SH ROW K TUBE 8 TEMP	DEG F	1009.447605	984.9623597	968.5054857	974.2237884	959.8706657
ANCO2_2BGB479XTE	U2 HOT SH ROW K TUBE 18 TEMP	DEG F	1006.098337	985.7039261	970.0165861	983.0235994	963.8000057
ANCO2_2BGB480XTE	U2 HOT SH ROW K TUBE 28 TEMP	DEG F	1018.817104	1005.053787	985.9175896	1004.843803	976.3258095
ANCO2_2BGB481XTE	U2 HOT SH ROW K TUBE 38 TEMP	DEG F	998.11581	996.8139578	980.4557832	997.4486102	978.4374195
ANCO2_2BGB482XTE	U2 HOT SH ROW K TUBE 48 TEMP	DEG F	978.7757326	992.1921216	980.1190794	992.7461268	981.0129003
ANCO2_2BGB484XTE	U2 HOT SH ROW K TUBE 68 TEMP	DEG F	975.0914054	976.8178089	970.7246476	978.6910484	967.878259
ANCO2_2BGB485XTE	U2 HOT SH ROW K TUBE 78 TEMP	DEG F	980.0670588	985.7207266	976.3731678	984.6841126	971.0988084
ANCO2_2BGB486XTE	U2 HOT SH ROW K TUBE 88 TEMP	DEG F	1008.017672	995.7331222	985.8853112	1000.624723	976.6527155
ANCO2_2BGB487XTE	U2 HOT SH ROW K TUBE 98 TEMP	DEG F	988.7269409	978.1284437	973.0300515	982.5865143	961.980157
ANCO2_2BGB488XTE	U2 HOT SH ROW K TUBE 108 TEMP	DEG F	1001.254149	980.6702097	965.7499971	974.4757192	947.0322938
ANCO2_2BGB490XTE	U2 SH INT ROW X TUBE 29 TEMP	DEG F	75.41039491	77.71127665	76.85466262	75.50437367	75.99202799
ANCO2_2BGB491XTE	U2 SH INT ROW Y TUBE 29 TEMP	DEG F	851.1936935	889.5434663	914.9551376	942.1265046	932.1346409
ANCO2_2BGB492XTE	U2 SH INT ROW Z TUBE 29 TEMP	DEG F	818.7242667	894.5668559	910.2290054	943.5625824	927.520392
ANCO2_2BGB494XTE	U2 SH INT ROW X TUBE 58 TEMP	DEG F	829.1940736	924.4660904	943.3143668	976.8540943	963.5169107
ANCO2_2BGB495XTE	U2 SH INT ROW Y TUBE 58 TEMP	DEG F	76.11458186	78.82306056	77.91586618	75.35756851	76.07498517
ANCO2_2BGB496XTE	U2 SH INT ROW Z TUBE 58 TEMP	DEG F	822.687284	910.9366885	933.2969408	962.5146601	953.629323
ANCO2_2BGB498XTE	U2 SH INT ROW X TUBE 87 TEMP	DEG F	76.29422593	78.87397246	78.07089528	75.91960254	76.55932234
ANCO2_2BGB499XTE	U2 SH INT ROW Y TUBE 87 TEMP	DEG F	75.73758227	78.56499375	77.75499375	75.60508964	76.14823426
ANCO2_2BGB500XTE	U2 SH INT ROW Z TUBE 87 TEMP	DEG F	834.6943172	871.6851474	918.5608755	940.7269971	921.2563419
ANCO2_2BGB501XTE	U2 SH INT ROW W TUBE 8 TEMP	DEG F	847.1405504	871.4233625	883.8503171	904.4684634	899.1564121
ANCO2_2BGB502XTE	U2 SH INT ROW W TUBE 18 TEMP	DEG F	-98737.99873	-98596.08037	-98639.39172	-98770.87402	-98733.30152
ANCO2_2BGB503XTE	U2 SH INT ROW W TUBE 28 TEMP	DEG F	839.0287209	873.911242	898.9242819	921.7615357	911.6987907

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ANC02_2BGB504XTE	U2 SH INT ROW W TUBE 38 TEMP	DEG F	76.73014992	79.41606663	78.41741175	76.43549022	76.95449998
ANC02_2BGB505XTE	U2 SH INT ROW W TUBE 48 TEMP	DEG F	831.8628559	899.523726	920.9218598	951.2488692	936.3444379
ANC02_2BGB507XTE	U2 SH INT ROW W TUBE 68 TEMP	DEG F	849.6607485	898.2445054	925.5025967	959.8137476	945.0364563
ANC02_2BGB508XTE	U2 SH INT ROW W TUBE 78 TEMP	DEG F	826.9864194	871.3651314	907.1965024	931.4891498	922.2137658
ANC02_2BGB509XTE	U2 SH INT ROW W TUBE 88 TEMP	DEG F	76.47084372	78.9771353	77.97497215	75.94910111	76.60758977
ANC02_2BGB510XTE	U2 SH INT ROW W TUBE 98 TEMP	DEG F	71.62968375	73.5240058	72.65973049	71.44058655	71.8736748
ANC02_2BGB511XTE	U2 SH INT ROW W TUBE 108 TEMP	DEG F	71.03021786	72.93608931	72.12811537	71.0433077	71.17938839
ANC02_2BGB518XTE	U2 SH HDR 9 TUBE 30 TEMP	DEG F	1004.901281	1000.938043	989.6872678	1001.010854	980.5801786
ANC02_2BGB519XTE	U2 SH HDR 9 TUBE 44 TEMP	DEG F	979.9649901	1002.013523	987.7459193	997.9139897	992.2462388
ANC02_2BGB520XTE	U2 SH HDR 9 TUBE 66 TEMP	DEG F	1002.565318	1014.474901	999.8122044	1012.141872	996.3428676
ANC02_2BGB521XTE	U2 SH HDR 9 TUBE 73 TEMP	DEG F	1002.542323	1014.260955	1003.482	1016.459691	1001.488728
ANC02_2BGB522XTE	U2 SH HDR 9 TUBE 94 TEMP	DEG F	1018.713635	1005.446784	994.3308473	1010.663638	984.3484774
ANC02_2BGB523XTE	U2 SH HDR 9 TUBE 101 TEMP	DEG F	1022.37814	1003.592549	991.8870068	1006.109747	977.9662126
ANC02_2BGB524XTE	U2 SH HDR 9 TUBE 108 TEMP	DEG F	-99147.71648	-99017.51852	-99052.81919	-99155.72186	-99122.77907
ANC02_2SHOHLBRTBM	SHOH MAX BLR TUBE TEMP	DEG F	1029.880842	1022.073812	1000.794246	1019.616751	1001.509771
ANC02_2BGB413XTE	U2 SH F.H. INLT HDR ROW V PNL 9	DEG F	697.7316455	699.8388235	705.1633913	698.2161619	708.3192824
ANC02_2BGB415XTE	23 U2 SH F.H. INLT HDR ROW V PNL	DEG F	704.6865603	708.4427864	722.9700076	710.3419547	727.6355828
ANC02_2BGB418XTE	37 U2 SH F.H. INLT HDR ROW V PNL	DEG F	697.5951786	705.1893032	712.2626981	707.9136233	718.0532717
ANC02_2BGB420XTE	51 U2 SH F.H. INLT HDR ROW V PNL	DEG F	75.7965188	78.27459153	77.24175811	75.73656317	76.23704955
ANC02_2BGB428XTE	65 U2 SH F.H. INLT HDR ROW V PNL	DEG F	697.4626215	707.4766874	722.198753	710.8407619	724.0481165
ANC02_2BGB430XTE	79 U2 SH F.H. INLT HDR ROW V PNL	DEG F	692.9800193	699.2343496	707.1639113	703.0715151	710.423464
ANC02_2BGB433XTE	93 U2 SH FH INLT HDR ROW V PNL	DEG F	75.83358846	78.55850574	77.62022469	75.74325244	76.24864636
ANC02_2BGB435XTE	107 U2 SH FH INLT HDR ROW V PNL	DEG F	76.62225969	79.58183608	78.63291142	76.58230319	77.1293864
ANC02_2BGB110XTE	U2 RH HDR 2 ROW D TUBE 9 TEMP	DEG F	1001.266976	902.3194359	929.9692314	889.4731871	928.8364178
ANC02_2BGB111XTE	U2 RH HDR 2 ROW D TUBE 30 TEMP	DEG F	1032.826081	944.0494304	953.5356063	928.0416582	945.0028137
ANC02_2BGB112XTE	U2 RH HDR 2 ROW D TUBE 44 TEMP	DEG F	1025.051741	946.0848861	958.1100345	925.1024182	950.2518945
ANC02_2BGB113XTE	U2 RH HDR 2 ROW D TUBE 73 TEMP	DEG F	1042.54415	1012.497247	993.7258274	1011.978708	985.4596883
ANC02_2BGB115XTE	U2 RH HDR 2 ROW D TUBE 94 TEMP	DEG F	1008.385272	955.6011772	969.5482693	937.1518516	971.405806
ANC02_2BGB117XTE	U2 RH HDR 2 ROW D TUBE 101 TEMP	DEG F	1007.880201	927.9706604	951.4239412	912.2665031	943.4739903
ANC02_2BGB118XTE	U2 RH HDR 2 ROW D TUBE 108 TEMP	DEG F	76.910916	79.09473994	78.28085599	76.60637906	77.18569
ANC02_2BGB119XTE	U2 RH HDR 2 ROW D TUBE 115 TEMP	DEG F	-98846.20441	-98694.0616	-98735.31117	-98856.51216	-98820.86778
ANC02_2BGB120XTE	U2 SH/RH SUPPORT18 TUBE 1 TEMP	DEG F	-97225.93936	-97076.2492	-97115.67284	-97239.1751	-97203.31273
ANC02_2BGB412XTE	U2 SH/RH SUPPORT18 TUBE 3 TEMP	DEG F	674.9168742	666.8532248	651.728122	655.1596035	649.495808
ANC02_2BGB414XTE	U2 SH/RH SUPPORT18 TUBE 5 TEMP	DEG F	138.3561496	94.82834517	95.28104529	133.6000622	124.0694983
ANC02_2BGB416XTE	TEMP	DEG F	675.4264668	667.1351815	653.7375313	655.6848057	651.7571594

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ANC02_2BGB417XTE	U2 SH/RH SUPPORT38 TUBE 1 TEMP	DEG F	672.7884843	665.0649985	647.2918092	653.0298126	644.8392849
ANC02_2BGB419XTE	U2 SH/RH SUPPORT38 TUBE 3 TEMP	DEG F	-98910.81014	-98777.55331	-98817.08127	-98902	-98894.91575
ANC02_2BGB421XTE	U2 SH/RH SUPPORT38 TUBE 5 TEMP	DEG F	668.3735156	659.9096613	641.1616957	647.521335	638.7260658
ANC02_2BGB422XTE	U2 SH/RH SUPPORT58 TUBE 1 TEMP	DEG F	670.8650342	663.0903291	644.0279369	650.9209904	641.4672018
ANC02_2BGB423XTE	U2 SH/RH SUPPORT58 TUBE 2 TEMP	DEG F	671.4050763	663.4891877	644.485649	651.3109788	642.0498952
ANC02_2BGB424XTE	U2 SH/RH SUPPORT58 TUBE 3 TEMP	DEG F	671.6628127	663.7251228	644.5834294	651.391945	642.0951604
ANC02_2BGB425XTE	U2 SH/RH SUPPORT58 TUBE 4 TEMP	DEG F	656.7855362	648.8074791	628.5922943	635.6249534	625.6305138
ANC02_2BGB426XTE	U2 SH/RH SUPPORT58 TUBE 5 TEMP	DEG F	671.291859	663.1548554	644.141995	651.0717284	641.7021983
ANC02_2BGB427XTE	U2 SH/RH SUPPORT78 TUBE 1 TEMP	DEG F	-98651.79399	-98542.23533	-98583.15557	-98688.76722	-98651.46528
ANC02_2BGB429XTE	U2 SH/RH SUPPORT78 TUBE 3 TEMP	DEG F	672.4174559	664.6423253	647.5953777	652.6677664	645.4280295
ANC02_2BGB431XTE	U2 SH/RH SUPPORT78 TUBE 5 TEMP	DEG F	671.4691266	663.7252245	645.7827092	651.5528459	643.3908133
ANC02_2BGB432XTE	U2 SH/RH SUPPORT98 TUBE 1 TEMP	DEG F	-97602	-97602	-97602	-97602	-97602
ANC02_2BGB434XTE	U2 SH/RH SUPPORT98 TUBE 3 TEMP	DEG F	648.9680701	640.616246	625.8970851	627.5464222	623.0204465
ANC02_2BGB436XTE	U2 SH/RH SUPPORT98 TUBE 5 TEMP	DEG F	673.5348993	664.9439004	651.6020405	653.635559	649.4087795
ANC02_2BGB438XTE	U2 HOT RH ROW B TUBE 29 TEMP	DEG F	1018.086046	942.1751134	952.0906112	919.6110814	942.4816543
ANC02_2BGB439XTE	U2 HOT RH ROW C TUBE 29 TEMP	DEG F	1023.671626	944.4728048	956.0925948	923.6947274	947.6794416
ANC02_2BGB440XTE	U2 HOT RH ROW D TUBE 29 TEMP	DEG F	75.80512072	78.43670221	77.55208818	75.82767042	76.38583102
ANC02_2BGB441XTE	U2 HOT RH ROW E TUBE 29 TEMP	DEG F	1041.502313	956.3985567	965.206654	938.1292329	955.1266724
ANC02_2BGB442XTE	U2 HOT RH ROW F TUBE 29 TEMP	DEG F	1038.867754	961.4548559	963.3737988	943.0992737	956.3120371
ANC02_2BGB444XTE	U2 HOT RH ROW B TUBE 58 TEMP	DEG F	983.7171145	941.1537718	958.9696083	915.005538	961.049944
ANC02_2BGB445XTE	U2 HOT RH ROW C TUBE 58 TEMP	DEG F	976.5494367	934.9346844	951.8021132	909.2814768	956.8321521
ANC02_2BGB446XTE	U2 HOT RH ROW D TUBE 58 TEMP	DEG F	989.2550546	946.7149179	960.9973171	924.4373026	963.6434634
ANC02_2BGB447XTE	U2 HOT RH ROW E TUBE 58 TEMP	DEG F	997.121048	953.7928918	967.1963991	929.6567614	970.936255
ANC02_2BGB448XTE	U2 HOT RH ROW F TUBE 58 TEMP	DEG F	994.8003656	958.9437134	966.4300667	933.8195732	969.4826767
ANC02_2BGB450XTE	U2 HOT RH ROW B TUBE 87 TEMP	DEG F	-100052.7009	-99912.78172	-99951.83888	-100068.5248	-100032.8095
ANC02_2BGB451XTE	U2 HOT RH ROW C TUBE 87 TEMP	DEG F	1015.200932	946.8265092	960.8887451	-16919.68811	-19190.93503
ANC02_2BGB452XTE	U2 HOT RH ROW D TUBE 87 TEMP	DEG F	1013.66775	942.1817854	958.0714329	928.4515228	954.9033731
ANC02_2BGB453XTE	U2 HOT RH ROW E TUBE 87 TEMP	DEG F	1026.292024	953.7292306	964.0322295	941.0997683	961.3866303
ANC02_2BGB454XTE	U2 HOT RH ROW F TUBE 87 TEMP	DEG F	75.76904881	77.69518933	76.87373456	75.54426319	75.97302154
ANC02_2BGB455XTE	U2 HOT RH ROW F TUBE 8 TEMP	DEG F	1005.846002	917.9213239	932.4072011	905.2743434	933.2040976
ANC02_2BGB456XTE	U2 HOT RH ROW F TUBE 18 TEMP	DEG F	872.6146134	803.7157166	806.2648763	771.7922275	786.4745397
ANC02_2BGB457XTE	U2 HOT RH ROW F TUBE 28 TEMP	DEG F	1041.270274	965.5477101	966.3230118	949.3281743	957.9162994
ANC02_2BGB458XTE	U2 HOT RH ROW F TUBE 38 TEMP	DEG F	899.4953877	887.444638	883.3988968	878.6942387	877.7405193
ANC02_2BGB459XTE	U2 HOT RH ROW F TUBE 48 TEMP	DEG F	1020.078723	970.473604	970.1525865	946.094696	967.5791448
ANC02_2BGB461XTE	U2 HOT RH ROW F TUBE 68 TEMP	DEG F	1011.993227	965.5358641	967.9661745	943.9693718	970.3907552
ANC02_2BGB462XTE	U2 HOT RH ROW F TUBE 78 TEMP	DEG F	1008.149448	951.9129642	961.3244269	937.1278317	962.5445331

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	ANC02_2BGB463XTE	U2 HOT RH ROW F TUBE 88 TEMP	DEG F	1024.250168	956.7027756	964.6916829	943.6773307	961.4174586
	ANC02_2BGB464XTE	U2 HOT RH ROW F TUBE 98 TEMP	DEG F	-96992.80727	-96864.21534	-96900.49023	-97008.13708	-96971.72606
	ANC02_2BGB465XTE	U2 HOT RH ROW F TUBE 108 TEMP	DEG F	994.6969486	901.0085285	911.4051494	881.6369596	900.2064419
	ANC02_2BGB512XTE	U2 RH HDR 2 TUBE 2 TEMP	DEG F	1039.333366	906.9701451	896.6679744	890.3458786	898.6279868
	ANC02_2BGB513XTE	U2 RH HDR 2 TUBE 16 TEMP	DEG F	1012.766608	919.6135689	939.995041	900.2979894	935.3885142
	ANC02_2BGB514XTE	U2 RH HDR 2 TUBE 37 TEMP	DEG F	1023.935302	952.7868793	959.0844293	930.1574634	954.3903789
	ANC02_2BGB515XTE	U2 RH HDR 2 TUBE 51 TEMP	DEG F	1006.675555	948.2086197	955.8410598	923.6965969	958.9001028
	ANC02_2BGB516XTE	U2 RH HDR 2 TUBE 66 TEMP	DEG F	-99034.0806	-98906.032	-98941.80001	-99044.0326	-99012.06549
	ANC02_2BGB517XTE	U2 RH HDR 2 TUBE 80 TEMP	DEG F	984.7032184	926.358174	948.733681	909.5494411	947.0160705
Economizer Outlet Links	ANC02_2BDB140XTE	U2 RH HDR 2 TUBE 66 TEMP	DEG F	-99034.0806	-98906.032	-98941.80001	-99044.0326	-99012.06549
	ANC02_2BDB141XTE	U2 RH HDR 2 TUBE 80 TEMP	DEG F	984.7032184	926.358174	948.733681	909.5494411	947.0160705
Feedwater to Economizer	ANC02_2BFB106XTE	U2 FEEDWTR ECON INLT TEMP	DEG F	472.1842626	381.8706168	323.0709503	382.2694654	321.5770249
	ANC02_2BDB140XTE	2A ECON OUT HEADER TEMP	DEG F	529.0932093	463.110453	490.3315033	461.1117825	491.4540727
	ANC02_2BDB141XTE	2B ECON OUT HEADER TEMP	DEG F	529.7225035	464.4612912	490.5239476	463.029237	491.6503838
Air Heater Gas Outlets **	ANC02_2BGD128XTE	2A AIR PREHTR OUTLT GAS TEMP	DEG F	368.3112857	243.5426952	217.099812	273.9183792	249.8180924
	ANC02_2BGD129XTE	2A AIR PREHTR OUTLT GAS TEMP	DEG F	356.0078958	236.4817188	208.9377528	268.1860855	242.5332733
	ANC02_2BGD130XTE	2A AIR PREHTR OUTLT GAS TEMP	DEG F	361.1747638	241.3644771	215.9359002	271.1409647	247.8184826
	ANC02_2BGD131XTE	2A AIR PREHTR OUTLT GAS TEMP	DEG F	332.7443478	232.4536007	204.5186744	259.637954	238.3483473
	ANC02_2BGD132XTE	2B AIR PREHTR OUTLT GAS TEMP	DEG F	329.6325224	222.5899588	197.6432831	253.9802639	234.0368574
	ANC02_2BGD133XTE	2B AIR PREHTR OUTLT GAS TEMP	DEG F	339.0422501	225.1356531	200.3963923	255.3879842	235.9184443
	ANC02_2BGD134XTE	2B AIR PREHTR OUTLT GAS TEMP	DEG F	354.3006465	228.3408737	204.5001962	260.6571318	239.4600116
	ANC02_2BGD135XTE	2B AIR PREHTR OUTLT GAS TEMP	DEG F	371.8180762	234.850719	209.4413809	267.4373001	244.3183697
Air Heater Gas Inlets (Economizer Gas Outlets)**	ANC02_2BGD120XTE	2A AIR PREHTR INLET GAS TEMP	DEG F	735.2940928	549.6356549	514.3478255	544.7712754	516.0126576
	ANC02_2BGD121XTE	2A AIR PREHTR INLET GAS TEMP	DEG F	714.5901481	539.9778192	510.6369939	531.47444	509.8996291
	ANC02_2BGD122XTE	2A AIR PREHTR INLET GAS TEMP	DEG F	741.9307295	559.7750305	531.8329688	556.8041472	531.7525302
	ANC02_2BGD123XTE	2A AIR PREHTR INLET GAS TEMP	DEG F	756.2669559	570.5739887	539.1647763	566.1341285	539.5716384
	ANC02_2BGD124XTE	2B AIR PREHTR INLET GAS TEMP	DEG F	744.8181067	577.8441369	548.8728984	571.3330113	549.8981275
	ANC02_2BGD125XTE	2B AIR PREHTR INLET GAS TEMP	DEG F	733.4372802	568.0530488	536.3381421	559.5194071	536.166005
	ANC02_2BGD126XTE	2B AIR PREHTR INLET GAS TEMP	DEG F	698.6946753	531.6146028	501.2561834	526.7863203	498.5172526
	ANC02_2BGD127XTE	2B AIR PREHTR INLET GAS TEMP	DEG F	731.4993453	551.5444374	517.1844387	547.2810093	516.8064633

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Air Heater Air Outlets	ANC02_2BGD112XTE	2A AIR PREHTR	OUTLT AIR TEMP	DEG F	513.0334203	435.6029145	419.4911216	444.429505	429.543405
	ANC02_2BGD113XTE	2A AIR PREHTR	OUTLT AIR TEMP	DEG F	526.0819614	425.5925911	417.2205701	441.2061277	426.6087787
	ANC02_2BGD114XTE	2A AIR PREHTR	OUTLT AIR TEMP	DEG F	569.4809187	451.0910406	431.7803407	459.8317593	440.1132529
	ANC02_2BGD115XTE	2A AIR PREHTR	OUTLT AIR TEMP	DEG F	580.85568	452.9032894	430.1234957	458.6135086	437.4772851
	ANC02_2BGD116XTE	2B AIR PREHTR	OUTLT AIR TEMP	DEG F	501.1574366	428.5009299	412.1356659	435.2474233	422.2954184
	ANC02_2BGD117XTE	2B AIR PREHTR	OUTLT AIR TEMP	DEG F	517.4893369	435.5280339	421.4170074	443.5721065	431.5216955
	ANC02_2BGD118XTE	2B AIR PREHTR	OUTLT AIR TEMP	DEG F	515.3395917	418.7302403	405.1260124	427.3630537	415.1390894
	ANC02_2BGD119XTE	2B AIR PREHTR	OUTLT AIR TEMP	DEG F	571.2943848	453.6522181	432.7930443	459.1929166	441.3535216
Air Heater Air Inlets	ANC02_2BGD104XTE	2A AIR PREHTR	INLET AIR TEMP	DEG F	107.9154934	77.17338167	77.68224971	144.0308195	147.209491
	ANC02_2BGD105XTE	2A AIR PREHTR	INLET AIR TEMP	DEG F	109.1985785	77.08405341	78.51357484	142.7656015	140.9905137
	ANC02_2BGD106XTE	2A AIR PREHTR	INLET AIR TEMP	DEG F	111.0181176	78.10593178	79.69963844	133.4040125	134.8198592
	ANC02_2BGD107XTE	2A AIR PREHTR	INLET AIR TEMP	DEG F	111.0940144	78.36373331	79.84152212	116.4722187	118.1203725
	ANC02_2BGD108XTE	2B AIR PREHTR	INLET AIR TEMP	DEG F	111.4504151	72.91325666	74.65768669	128.5282768	134.8932481
	ANC02_2BGD109XTE	2B AIR PREHTR	INLET AIR TEMP	DEG F	109.5334539	73.15763818	74.85195218	127.1998139	130.613238
	ANC02_2BGD110XTE	2B AIR PREHTR	INLET AIR TEMP	DEG F	107.9247233	72.82312174	74.7071408	131.0488083	136.8495773
	ANC02_2BGD111XTE	2B AIR PREHTR	INLET AIR TEMP	DEG F	109.3869335	73.20756328	75.14578168	125.9555598	124.6705007
Ambient Air	ANC02_2AWW100XTE	AMBIENT AIR TEMP		DEG F	84.88444184	46.14793131	44.17262828	85.73851471	78.99767755
Ambient (Barometric Pressure)	ANC00_0AWD141XA	BAROMETER	PRESSURE	IN HG	30.00789621	30.40493545	30.38885082	30.04941861	30.0281818
Forced Draft Fan Discharge (Air Heater Air Inlet)	ANC02_2BGD102XPT	2A FD FAN	DISCH PRESS	IN WG	33.74796296	6.125978071	3.538652698	9.103010332	5.487053036
	ANC02_2BGD103XPT	2B FD FAN	DISCH PRESS	IN WG	36.22186994	7.068898389	4.704421265	9.928885755	6.453285693
Windbox/Furnace Differential Pressure	ANC02_2BGB144XPT	U2 WINDBOX TO	FURN D/P 1	IN WG	7.555477678	3.191738596	3.177512498	5.937010312	4.815013088
	ANC02_2BGB144XPT2	U2 WINDBOX TO	FURN D/P 2	IN WG	7.49267608	3.201607492	3.264143179	5.783099669	4.74091003
Furnace	ANC02_2BGB145XPT	2A FURNACE PRESS		IN WG	20.03125592	2.846298951	0.966703227	3.136697983	1.259693057
	ANC02_2BGB150XPT	2B FURNACE PRESS		IN WG	19.96299178	2.864420234	0.938558939	3.098789725	1.224281151
Absolute or differential pressures, as available	ANC02_2BGB135XPT	U2 SUPER-HEATER DIFF PRESS		IN WG	1.170702527	0.132236186	0.006693233	0.048167495	-0.027142979
	ANC02_2BGB136XPT	U2 RE-HEATER FRONT DIFF PRESS		IN WG	0.098574712	-0.081292954	-0.099914725	-0.084237041	-0.096629305
	ANC02_2BGB137XPT	U2 ECONOMIZER DIFF PRESS		IN WG	5.49902352	1.480708935	0.951948337	1.322253066	0.95201166
	ANC02_2BGB138XPT	U2 RE-HEATER REAR DIFF PRESS		IN WG	5.730461758	1.789352454	1.28678106	1.52624964	1.214209936
	ANC02_2BGB143XPT	2A GRF DIFF PRESS		IN WG	10.76573936	2.702861643	1.104794779	2.022006249	1.11029038
	ANC02_2BGB163XPT	DIFF PRESS AT COIL 2A		IN WG	1.725665986	0.58255687	0.636873394	0.639368764	0.537676567

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	ANC02_2BGB164XPT	DIFF PRESS	AT COIL 2B	IN WG	2.021011134	0.684306222	0.358946896	0.951394959	0.507701856
Air Heater Gas Side Differential Pressures	ANC02_2BGD138XPT	2A AIR PREHTR	GAS DP	IN WG	5.869657276	1.019325321	0.617768624	1.158345284	0.529746962
	ANC02_2BGD139XPT	2B AIR PREHTR	GAS DP	IN WG	5.883326201	1.258380383	0.775032562	1.362738931	0.822116835
Air Heater Air Side Differential Pressures	ANC02_2BGD136XPT	2A AIR PREHTR	AIR DP	IN WG	-0.750368315	0.085029349	0.002961997	-1.704230554	-1.699389087
	ANC02_2BGD137XPT	2B AIR PREHTR	AIR DP	IN WG	0.591186457	0.451305301	0.057637887	0.650438114	0.474668289
Flue gas temperature inlet to FGR Fan , °F	ANC02_2BGB263XTE	2A GRF INLET	DUCT A TEMP 1	DEG F	635.7989903	585.8809972	544.3080632	570.1734784	548.1869424
	ANC02_2BGB264XTE	2A GRF INLET	DUCT A TEMP 2	DEG F	624.4021677	589.5489679	548.3528629	574.0321399	553.0569784
	ANC02_2BGB265XTE	2A GRF INLET	DUCT A TEMP 3	DEG F	618.0277973	571.8018667	531.8300531	551.6176162	534.7500412
	ANC02_2BGB266XTE	2A GRF INLET	DUCT A TEMP 4	DEG F	548.5276159	516.9757404	483.7143271	501.6528262	485.8181564
	ANC02_2BGB267XTE	2A GRF INLET	DUCT B TEMP 1	DEG F	628.7133303	582.6913359	543.1212071	560.9375455	548.8643252
	ANC02_2BGB268XTE	2A GRF INLET	DUCT B TEMP 2	DEG F	635.3873224	577.7733637	538.2855502	558.0220288	544.4666762
	ANC02_2BGB269XTE	2A GRF INLET	DUCT B TEMP 3	DEG F	622.2464577	570.7920229	531.1924131	543.7349347	536.5496615
	ANC02_2BGB270XTE	2A GRF INLET	DUCT B TEMP 4	DEG F	606.6422053	566.8925222	527.2209183	539.9664495	531.5704156
Flue gas temperature outlet of FGR fan, °F	ANC02_2BGB251XTE	2A GRF DISCH	DUCT TEMP 1	DEG F	636.6518102	585.8456669	546.2313404	571.4768358	548.8136176
	ANC02_2BGB252XTE	2A GRF DISCH	DUCT TEMP 2	DEG F	-27489.86506	-98388.5321	-98431.96379	-98080.67037	-98494.32718
	ANC02_2BGB253XTE	2A GRF DISCH	DUCT TEMP 3	DEG F	636.3756259	585.3188919	546.2289079	571.3047513	549.4837398
	ANC02_2BGB254XTE	2A GRF DISCH	DUCT TEMP 4	DEG F	-98920.04192	-98791.1941	-98833.61007	-98924.3683	-98887.50987
	ANC02_2BGB255XTE	2A GRF DISCH	DUCT TEMP 5	DEG F	637.7777977	585.6292047	547.1462161	571.3197795	550.6548039
	ANC02_2BGB256XTE	2A GRF DISCH	DUCT TEMP 6	DEG F	640.1477887	586.4803192	547.999772	572.0046347	551.3402881
	ANC02_2BGB257XTE	2A GRF DISCH	DUCT TEMP 7	DEG F	636.1370203	584.0263752	546.0681692	568.4009775	549.2936715
	ANC02_2BGB258XTE	2A GRF DISCH	DUCT TEMP 8	DEG F	-98226.48313	-94184.35766	-98418.92233	-98756.90375	-98732.52937
	ANC02_2BGB259XTE	2A GRF DISCH	DUCT TEMP 9	DEG F	636.1403545	584.428889	547.0051507	566.8019319	550.172754
	ANC02_2BGB260XTE	2A GRF DISCH	DUCT TEMP 10	DEG F	-9406.729703	-8870.891032	-8250.181843	-7806.890927	-7660.136221
	ANC02_2BGB261XTE	2A GRF DISCH	DUCT TEMP 11	DEG F	633.2570572	581.3628926	544.3459427	560.69966	546.9615842
	ANC02_2BGB262XTE	2A GRF DISCH	DUCT TEMP 12	DEG F	639.5326574	581.1274287	544.9529984	562.0794767	547.6041758
Flue Gas Recirc Fan Amps	ANC02_2BGB143XPT	2A GRF DIFF	PRESS	IN WG	10.76573936	2.702861643	1.104794779	2.022006249	1.11029038
	ANC02_2BG1101XAI	2A GAS RECIRC	FAN MTR AMPS	AMPS	106.2240189	119.8193055	116.9433069	109.4317783	113.7234447
	ANC02_2BG1005XAI	2A GAS RCRC FAN	DMPR POSITION	%	22.79462607	23.90780844	18.60872985	10.68715054	15.93738565

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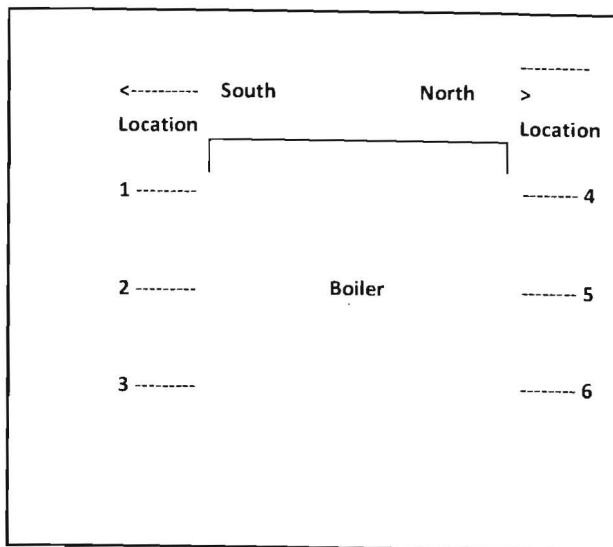
Fuel Nozzle Tilt, degrees from horizontal	ANC02_2bgj008xax	U2 BURNER TILT DEMAND	%	8.259531834	5.416992188	0.114462614	-19.80000114	-19.80000114
Windbox Damper Positions, percent	ANC02_2BGJ009AAX	2A1 FUEL AIR DAMPER DEMAND	%	100	75.9462971	64.09324549	79.1734441	61.94601909
	ANC02_2BGJ009BAX	2B1 FUEL AIR DAMPER DEMAND	%	100	75.94682524	64.10269125	79.1734441	-5
	ANC02_2BGJ009CAX	2C1 FUEL AIR DAMPER DEMAND	%	100	75.94499104	64.1608213	79.1734441	61.95260847
	ANC02_2BGJ009DAX	2D1 FUEL AIR DAMPER DEMAND	%	100	75.93687939	64.16007661	79.1734441	61.93794719
	ANC02_2BGJ010AAX	2A2 FUEL AIR DAMPER DEMAND	%	100	75.93845644	64.11113204	79.1734441	61.94622424
	ANC02_2BGJ010BAX	2B2 FUEL AIR DAMPER DEMAND	%	100	75.93845644	64.08289571	79.1734441	61.9512292
	ANC02_2BGJ010CAX	2C2 FUEL AIR DAMPER DEMAND	%	100	75.93687939	64.12301658	79.1734441	61.95837483
	ANC02_2BGJ010DAX	2D2 FUEL AIR DAMPER DEMAND	%	100	75.93102887	64.09175433	79.44174478	61.93138769
	ANC02_2BGJ011AAX	2A3 FUEL AIR DAMPER DEMAND	%	100	75.93265466	64.09088963	-5	-5
	ANC02_2BGJ011BAX	2B3 FUEL AIR DAMPER DEMAND	%	100	75.95443631	-4.402538288	-5	-5
	ANC02_2BGJ011CAX	2C3 FUEL AIR DAMPER DEMAND	%	100	75.9512334	64.10588333	-5	-4.890891896
	ANC02_2BGJ011DAX	2D3 FUEL AIR DAMPER DEMAND	%	100	75.97321605	-5	-5	-5
	ANC02_2BGJ012AAX	2A4 FUEL AIR DAMPER DEMAND	%	100	75.98809851	-5	-5	-5
	ANC02_2BGJ012BAX	2B4 FUEL AIR DAMPER DEMAND	%	100	75.98213695	-5	-5	-5
	ANC02_2BGJ012CAX	2C4 FUEL AIR DAMPER DEMAND	%	100	75.94343607	-5	-5	-5
	ANC02_2BGJ012DAX	2D4 FUEL AIR DAMPER DEMAND	%	100	75.95101615	-5	-5	-5
	ANC02_2BGJ013AAX	2A5 FUEL AIR DAMPER DEMAND	%	100	10	10	10	10
	ANC02_2BGJ013BAX	2B5 FUEL AIR DAMPER DEMAND	%	100	10	10	10	10
	ANC02_2BGJ013CAX	2C5 FUEL AIR DAMPER DEMAND	%	100	10	10	10	10
	ANC02_2BGJ013DAX	2D5 FUEL AIR DAMPER DEMAND	%	100.0000458	10	10	10	10
	ANC02_2BGJ014AAX	2A1 AUX AIR DAMPER DEMAND	%	99.88203751	0.789222013	0.205946176	39.03218114	2.479251834
	ANC02_2BGJ014BAX	2B1 AUX AIR DAMPER DEMAND	%	99.88203751	0.789222013	0.205946176	39.02161463	2.478306047
	ANC02_2BGJ014CAX	2C1 AUX AIR DAMPER DEMAND	%	99.88203751	0.789222013	0.205946176	39.01339349	2.477833536
	ANC02_2BGJ014DAX	2D1 AUX AIR DAMPER DEMAND	%	99.88203751	0.789222013	0.205946176	39.04192311	2.486049102
	ANC02_2BGJ015AAX	2A2 AUX AIR DAMPER DEMAND	%	99.88203751	0.789222013	0.205946176	39.02275264	2.460200009
	ANC02_2BGJ015BAX	2B2 AUX AIR DAMPER DEMAND	%	99.88203751	0.789222013	0.205946176	39.0167189	2.457847472
	ANC02_2BGJ015CAX	2C2 AUX AIR DAMPER DEMAND	%	99.88203751	0.789222013	0.205946176	39.027649	2.454075824
	ANC02_2BGJ015DAX	2D2 AUX AIR DAMPER DEMAND	%	99.88203751	0.789222013	0.205946176	39.01582912	2.477297531
	ANC02_2BGJ016AAX	2A3 AUX AIR DAMPER DEMAND	%	99.88203751	0.789222013	0.205946176	-4.924361339	17.93038581
	ANC02_2BGJ016BAX	2B3 AUX AIR DAMPER DEMAND	%	99.97932744	0.789222013	0.205946176	-4.924361339	17.95010531
	ANC02_2BGJ016CAX	2C3 AUX AIR DAMPER DEMAND	%	99.97932744	0.789222013	0.205946176	-4.924357966	17.94749644
	ANC02_2BGJ016DAX	2D3 AUX AIR DAMPER DEMAND	%	99.88203751	0.789222013	0.205946176	-4.924361339	17.93034948
	ANC02_2BGJ017AAX	2A4 AUX AIR DAMPER DEMAND	%	99.97932744	0.789222013	0.205946176	-5	17.94682281
	ANC02_2BGJ017BAX	2B4 AUX AIR DAMPER DEMAND	%	99.97932744	0.789222013	0.205946176	-5	17.94341843
	ANC02_2BGJ017CAX	2C4 AUX AIR DAMPER DEMAND	%	99.97932744	0.789222013	0.205946176	-5	17.95101208
	ANC02_2BGJ017DAX	2D4 AUX AIR DAMPER DEMAND	%	99.97932744	0.789222013	0.205946176	-5	17.95393454
	ANC02_2BGJ018AAX	2A5 AUX AIR DAMPER DEMAND	%	99.97932744	-2.275	0.038244805	-5	17.9445538
	ANC02_2BGJ018BAX	2B5 AUX AIR DAMPER DEMAND	%	99.97932744	-2.275	0.038244805	-5	17.9350175
	ANC02_2BGJ018CAX	2C5 AUX AIR DAMPER DEMAND	%	99.97932744	-2.275	0.026950516	-5	17.9350175

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Ancote Station Units 1&2

	ANC02_2BGJ018DAX	2D5 AUX AIR DAMPER DEMAND	%	99.97932744	-2.269366291	0.038244805	-5	17.9511987
SOFA Overfire Air Damper Positions (if installed)	N/A	N/A	N/A					
SOFA Overfire Air Nozzle Tilts (if installed)	N/A	N/A	N/A					
Measured Air and Gas Flows, as available	ANC02_2BGB321TAI	U2 TOTAL AIR FLOW	KLB/HR	-0.295763871	-0.076554634	-0.048483844	-0.283753673	-0.294147946
	ANC02_2BGB342XFK	2A COMB AIR COMP FLOW	KLB/HR	0	0	0	0	0
	ANC02_2BGB342XFKS	2A COMB AIR FLOWSELECTED	KLB/HR	1662.705628	700.5685919	498.4467913	707.3334098	496.6138649
	ANC02_2BGB342XFT	2B COMB AIR FLOW	KLB/HR	0	0	0	0	0
	ANC02_2BGB342XFT1	2A COMB AIR FLOW1	KLB/HR	1654.220628	686.7300619	479.2902609	685.5544001	466.8238908
	ANC02_2BGB342XFT2	2A COMB AIR FLOW2	KLB/HR	1670.510525	716.3902184	518.0946046	730.1669098	527.0076983
	ANC02_2BGB343XFK	2B COMB AIR COMP FLOW	KLB/HR	0	0	0	0	0
	ANC02_2BGB343XFKS	2B COMB AIR FLOWSELECTED	KLB/HR	1718.088403	755.6912022	607.8965378	769.5535979	609.1894745
	ANC02_2BGB343XFT	2A COMB AIR FLOW	KLB/HR	0	0	0	0	0
	ANC02_2BGB343XFT1	2B COMB AIR FLOW1	KLB/HR	1719.685032	767.5733614	625.8279669	773.8054801	616.9822596
	ANC02_2BGB343XFT2	2B COMB AIR FLOW2	KLB/HR	1715.062679	741.7369148	588.1305692	764.741356	600.6214072
	ANC02_2BGB842XFK	2A COMB AIR FLOW	KLB/HR	[-11059] No Good Data For Calculation	[-11059] No Good Data For Calculation	[-11059] No Good Data For Calculation	[-11059] No Good Data For Calculation	[-11059] No Good Data For Calculation
	ANC02_2BGB843XFK	2B COMB AIR FLOW	KLB/HR	[-11059] No Good Data For Calculation	[-11059] No Good Data For Calculation	[-11059] No Good Data For Calculation	[-11059] No Good Data For Calculation	[-11059] No Good Data For Calculation
	ANC02_2BGD156XAI	U2 DUCT FLUE GAS FLOW(FROM CEMS)			-0.886954763	-0.871751355	-0.857917407	-0.870873782
	ANC02_2BGJ301XGJ	TOTAL AIR FLOW	KLB/HR	91.68416048	39.4558489	30.00557679	40.07886907	29.98281914
	ANC02_2BGJ302XGJ	U2 O2 TRIMMED AIR FLOW	%	93.97652908	37.44702394	22.95881941	38.28543005	21.94290635
Ambient Air Humidity (for efficiency calculations)	ANC00_OAWD140XAI	RELATIVE HUMIDITY	%	14.90872323	9.092030193	7.766506674	27.08192958	23.55056227
Oxygen Content Leaving Economizer (to determine excess air), percent ***	ANC02_2BGB201XAI	2A1 O2 PROBE (#1)	%	0.67	1.6	1.6	0	0
	ANC02_2BGB202XAI	2A2 O2 PROBE (#2)	%	0.63	1.5	1.5	0	0
	ANC02_2BGB203XAI	2A3 O2 PROBE (#3)	%	0.67	1.5	1.5	0	0
	ANC02_2BGB204XAI	2B1 O2 PROBE (#4)	%	0.97	1.2	1.2	0	0
	ANC02_2BGB205XAI	2B2 O2 PROBE (#5)	%	0.87	1.2	1.2	0	0
	ANC02_2BGB206XAI	2B3 O2 PROBE (#6)	%	0.97	1.2	1.2	0	0
CO2 Content Leaving Economizer (if available), percent ***		Blank Tagname	X	Blank Tagname	Blank Tagname	Blank Tagname	Blank Tagname	Blank Tagname
Oxygen Content Leaving Air Heater (if available), percent ***		Blank Tagname	X	Blank Tagname	Blank Tagname	Blank Tagname	Blank Tagname	Blank Tagname
CO2 Content Leaving Air Heater (if available), percent ***	ANC02_2BGD154XAI	U2 CO2 (FROM CEMS)			-0.606733825	-0.606864889	-0.610934827	-0.610630711
	ANC02_CEMS-NOX	2 CEMS NOX		0.294330696	0.212085586	0.275927004	0.046443494	0.152817645
	ANC02_2COAVG	2 FLUE GAS CO AVG		-474.3055667	-474.2751846	-474.2673068	-474.2566747	-474.2658285
	ANC02_2FOJ025XTE	U2 FUEL OIL HTR TEMP		195.6403906	191.5338408	203.3464167	162.7977554	162.942531

PEF-120103-EI-00154

Furnace Exit Gas Temp (Uncorrected)												
Load	544	544	400	280	185	185	185	185	185	185 *	185 **	185 ***
Location	SW	S	S	S	S	SE	SW	NW	N	NE	NW	NW
Start	830	845	945	1135	1330	1345	1400	1415	1425	1435	1440	1450
End	840	850	955	1145	1340	1355	1410	1425	1430	1440	1445	1455
3'	1980	2080	1960	1900	1500	1200	1250	1510	1210	1120		
6'	1990	2115	1985	1955	1650	1450	1500	1680	1650	1410		
9'	2045	2125	2000	1960	1730	1550	1700	1690	1690	1620	1580	1590
12'	2060	2130	2010	1970	1735	1570	1730	1710	1720	1690	1680	1690
15'	2080	2135	2015	1970	1730	1590	1730	1720	1740	1725	1710	1700
Average	2031	2117	1994	1951	1669	1472	1582	1662	1602	1513	1657	1660
Avg (less hi and Lo)	2032	2123	1998	1964	1703	1523	1665	1693	1687	1573	1657	1660
Avg (less outliers)	2031	2117	2003	1964	1732	1570	1720	1700	1700	1678	1657	1660



Furnace Exit Gas Temp (Corrected)												
Load	544	544	400	280	185	185	185	185	185	185 *	185 **	185 ***
Location	SW	S	S	S	S	SE	SW	NW	N	NE	NW	NW
Start	830	845	945	1135	1330	1345	1400	1415	1425	1435	1440	1450
End	840	850	955	1145	1340	1355	1410	1425	1430	1440	1445	1455
3'	0	0	0	0	0	0	0	0	0	0		
6'	0	0	0	0	0	0	0	0	0	0		
9'	0	0	0	0	0	0	0	0	0	0	0	0
12'	0	0	0	0	0	0	0	0	0	0	0	0
15'	0	0	0	0	0	0	0	0	0	0	0	0
Average	0	0	0	0	0	0	0	0	0	0	0	0
Avg (less hi and Lo)	0	0	0	0	0	0	0	0	0	0	0	0
Avg (less outliers)	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX 2

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units1&2

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* !!Progress Energy -- Anclote, Unit 2 - OIL FIRING - 98.55% MCR-
* BASELINE!! Burner tilts @ +8.25 deg.
* 7-19-11 Test on U2 @12:00pm -- 519.88 MWg
* TYPES OF RUN:
*      1 -- INPUT AND CHECK DATA
*      2 -- INITIALIZATION OF UAF AND FEGT
*      3 -- PERFORMANCE ANALYSIS
*
* RUN
* MODE
* ----
*      3
*
* NUMBER OF    NUMBER OF    NUMBER OF    NUMBER OF    NUMBER OF    TYPE
*   SECT      SHT SECT    RHT 1 SECT  RHT 2 SECT  ECON SECT  FUEL
* ----
*      18          5          5          0          2          2
*
* BACK PASS CONFIGURATION
*
*   TYPE      SECTIONS IN BYPASS/REHEATER STREAM      KSPLIT      IWRITE
* ----
*          0          0          0          1
*
* SECT TYPE DESCRIPTION
* ----+-----+
*  1  1  'FURNACE'
*  2  2  'PLATEN SUPERHEATER'
*  3  2  'PRIMARY SUPERHEATER'
*  4  2  'FINISHING SUPERHEATER'
*  5  3  'FINISHING REHEATER'
*  6  9  'FORWARD CAVITY'
*  7  2  'SUPERHEATER STRINGER TUBES'
*  8  3  'FORWARD VERTICAL REHEATER'
*  9  5  'SCREEN'
* 10  3  'REAR VERTICAL REHEATER'
* 11  4  'ECONOMIZER STRINGER TUBES'
* 12  9  'REAR CAVITY'
* 13  3  'PRIMARY REHEATER'
* 14  4  'ECONOMIZER'
* 15 10  'FLUE GAS RECIRCULATION CONNECTION'
* 16 12  'AIR PREHEATER'
* 17 14  'SUPERHEATER SPRAY'
* 18 14  'REHEATER SPRAY'
*
* STRING OF SUPERHEATER SECTIONS IN ORDER OF STEAM FLOW
* ----+-----+-----+-----+-----+-----+-----+-----+
*      7      2      3      17      4
*
* STRING OF REHEATER SECTIONS IN ORDER OF STEAM FLOW
* ----+-----+-----+-----+-----+-----+-----+
*     18     13     10      8      5

```

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Ancote Station Units 1&2

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*
*  STRING OF 2ND REHEATER SECTIONS IN ORDER OF STEAM FLOW
*  -----+-----+-----+-----+-----+-----+-----+-----+
*
*
*  STRING OF ECONOMIZER SECTIONS IN ORDER OF WATER FLOW
*  -----+-----+-----+-----+-----+-----+-----+-----+
*    14    11
*
*-----STEAM CONDITION DATA-----
*  SUPERHEATER OUTLET CONDITIONS
*
*    FLOW(LB/HR)      TEMP (F)      PRESSURE (PSIG)
*    -----
*    3507207.         1004.99         2415.1
*                                uses 120 psi MS lin delta P
*  REHEATER INLET CONDITIONS
*
*    FLOW(LB/HR)      TEMP (F)      PRESSURE (PSIG)      SPRAY FLOW (LB/HR)
*    -----
*    3124921.         646.3         558.49         0.0
*  89.1% of MS Flow
*
*                                --NOTE--REHEATER SPRAY FLOW IS INTENDED TO
*                                BE A MEANS OF CONTROLLING INLET
*                                CONDITIONS FOR PARALLEL OR BYPASS
*                                TYPE BOILERS, IF DESIRED.
*                                REHEATER SPRAY FLOW IS GENERALLY SET
*                                AT ZERO.
*
*  1ST REHEATER OUTLET CONDITIONS
*
*    TEMP (F)  -- TARGET
*    -----
*    997.0
*
*
*                                2ND REHEATER INLET/OUTLET CONDITIONS
*
*    FLOW (LB/HR)      INLET      INLET      OUTLET
*    -----      TEMP (F)      PRESSURE (PSIG)      TEMP (F)  --TARGET
*    0.0             0.0             0.0             0.0
*
*  ECONOMIZER INLET (FLOW BASED ON SUPERHEAT STEAM AND BLOWDOWN)
*
*                                TEMP (F)      PRESSURE (PSIG)
*                                -----
*                                472.2         2703.2
*
*  BOILING SECTION CONDITIONS
*
*    PWALL (PSIG)      BLOWDOWN (%MS)      WALL OUT TEMP (F)
*    -----
*    2633.71          0.1
*                      estimated

```

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclo Station Units1&2

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*          --NOTE--BOILER WALL OUT TEMP REQUIRED
*          FOR SUPERCRITICAL CASES ONLY.
*
*-----SECTION STEAM/WATER TERMINAL CONDITIONS-----
*
* NSECT      TEMP OUT (F)
*-----
*   2         698.09
*   3         857.97
*   4        1004.99
*   5         997.00
*   7         683.90 'estimated'
*   8         828.00 'estimated'
*  10         810.00 'estimated'
*  11         539.41
*  13         792.00 'estimated'
*  14         519.62 'estimated'
*  17         817.61
*  18         646.3
*
* NAME AND SOURCE OF FUEL (UP TO 60 CHARACTERS LONG--LEFT JUSTIFIED)
*
HEAVY OIL
*
* FUEL ULTIMATE ANALYSIS, AS FIRED(% BY WEIGHT):
*   C      H2      S      O2      N2      H2O      CL      NA      ASH
*-----
* 85.70    9.54    1.34    0.00    0.27    4.10    0.00    0.00    0.00
* Analysis is from 6/2011 Analysis
*   HHV      CPFUEL      TFUEL      TOTAIR      TAIRTH      TAIRFH      TFGO(UNC)
*-----
* 17289.    0.526      213.    103.79    109.69    536.84    366.20
*
* CREDITS(%)  LOSSES(%):  UNBURN FUEL  UNACCOUNTED  RAD(ABMA)
*-----
*   0.00              0.00          1.00          0.19
*
*-----FURNACE DATA-----
*
*   ELEV      AFURNO      RFEGT      CFEGT      RHEATI
*-----
*   0.0      1792.55    2116.40    0.00      0.470792D+10
*   49.167 x 36.458
*
* PLATEN SUPERHEATER
*
*-----CONVECTIVE SECTION DATA-----
*
* NSECT      WSECT      HSECT      TUBEOD      TUBEID      ST      SL
*-----
*   2         49.167    36.458    1.625    1.2625    10.0    2.0
*
* NTUBET      NTUBEL      ALEG      TUBEL      ILAT      EXTSRF      AWEFF
*-----

```

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclo Station Units1&2

58	6	1.105	18.23	1	1.00	1.0
HXTYPE	DTTUBE	PCTDFR	CLX	FC	UAF	ANGA
3	125.0	20.0	1.0	1.0	2.626	90.0
F	DTWALL	DPSTM	ANGWL	PCTLEAK		
0.02	65.0	43.61	0.0	0.0		
PRIMARY SUPERHEATER (As Modified -- Partial Lower loop removed)						
-----CONVECTIVE SECTION DATA-----						
NSECT	WSECT	HSECT	TUBEOD	TUBEID	ST	SL
3	49.167	36.458	2.000	1.382	5.0	3.0
NTUBET	NTUBEL	ALEG	TUBEL	ILAT	EXTSRF	AWEFF
116	4	4.0	30.83	1	1.0	1.0
HXTYPE	DTTUBE	PCTDFR	CLX	FC	UAF	ANGA
2	100.0	80.0	1.0	1.0	1.409	90.0
F	DTWALL	DPSTM	ANGWL	PCTLEAK		
0.03	50.0	45.0	0.0	0.0		
FINISHING SUPERHEATER						
-----CONVECTIVE SECTION DATA-----						
NSECT	WSECT	HSECT	TUBEOD	TUBEID	ST	SL
4	49.167	36.458	2.084	1.363	5.0	4.0
NTUBET	NTUBEL	ALEG	TUBEL	ILAT	EXTSRF	AWEFF
116	4	6.0	35.75	1	1.0	1.0
HXTYPE	DTTUBE	PCTDFR	CLX	FC	UAF	ANGA
2	100.0	0.0	1.0	1.0	0.964	90.0
F	DTWALL	DPSTM	ANGWL	PCTLEAK		
0.045	50.0	85.0	0.0	0.0		
FINISHING REHEATER						
-----CONVECTIVE SECTION DATA-----						

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclo Station Units1&2

* NSECT	WSECT	HSECT	TUBEOD	TUBEID	ST	SL
* 5	49.167	36.458	2.125	1.829	5.0	4.0
* NTUBET	NTUBEL	ALEG	TUBEL	ILAT	EXTSRF	AWEFF
* 116	6	2.96	35.75	1	1.0	1.0
* HXTYPE	DTTUBE	PCTDFR	CLX	FC	UAF	ANGA
* 3	50.0	0.0	1.0	1.0	1.201	90.0
* F	DTWALL	DPSTM	ANGWL	PCTLEAK		
* 0.043	25.0	24.0	0.0	0.0		
FORWARD CAVITY						
-----CAVITY SECTION DATA-----						
* NSECT	WSECT	HSECT	DSECT	AWEFF	DTWALL	PCTLEAK
* 6	49.167	24.00	12.0	1.0	20.0	0.0
SUPERHEATER STRINGER TUBES						
-----CONVECTIVE SECTION DATA-----						
* NSECT	WSECT	HSECT	TUBEOD	TUBEID	ST	SL
* 7	49.167	40.00	1.500	1.045	5.0	4.0
* NTUBET	NTUBEL	ALEG	TUBEL	ILAT	EXTSRF	AWEFF
* 116	6	1.0	40.0	1	1.50	1.0
* HXTYPE	DTTUBE	PCTDFR	CLX	FC	UAF	ANGA
* 4	25.0	0.0	1.0	1.0	2.539	0.0
* F	DTWALL	DPSTM	ANGWL	PCTLEAK		
* 0.016	20.0	45.0	0.0	0.0		
FORWARD VERTICAL REHEATER						
-----CONVECTIVE SECTION DATA-----						
* NSECT	WSECT	HSECT	TUBEOD	TUBEID	ST	SL
* 8	49.167	12.00	2.50	2.204	5.0	2.50
* NTUBET	NTUBEL	ALEG	TUBEL	ILAT	EXTSRF	AWEFF

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclo Station Units1&2

116	6	1.0	12.0	1	1.00	1.0
HXTYPE	DTTUBE	PCTDFR	CLX	FC	UAF	ANGA
4	25.0	0.0	1.0	1.0	1.172	90.0
F	DTWALL	DPSTM	ANGWL	PCTLEAK		
0.035	20.0	7.0	90.0	0.0		
SCREEN						
-----CONVECTIVE SECTION DATA-----						
NSECT	WSECT	HSECT	TUBEOD	TUBEID	ST	SL
9	49.167	17.00	2.0	1.467	10.0	3.0
NTUBET	NTUBEL	ALEG	TUBEL	ILAT	EXTSRF	AWEFF
58	4	1.00	17.0	1	1.0	1.0
HXTYPE	DTTUBE	PCTDFR	CLX	FC	UAF	ANGA
1	25.0	0.0	1.0	1.0	1.0	90.0
F	DTWALL	DPSTM	ANGWL	PCTLEAK		
0.025	20.0	5.0	90.0	0.0		
REAR VERTICAL REHEATER						
-----CONVECTIVE SECTION DATA-----						
NSECT	WSECT	HSECT	TUBEOD	TUBEID	ST	SL
10	49.167	17.0	2.500	2.204	5.0	3.0
NTUBET	NTUBEL	ALEG	TUBEL	ILAT	EXTSRF	AWEFF
116	6	1.0	17.0	1	1.0	1.0
HXTYPE	DTTUBE	PCTDFR	CLX	FC	UAF	ANGA
4	20.0	0.0	1.0	1.0	0.885	55.0
F	DTWALL	DPSTM	ANGWL	PCTLEAK		
0.035	20.0	5.0	55.0	0.0		
ECONOMIZER STRINGER TUBES						
-----CONVECTIVE SECTION DATA-----						

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Ancloste Station Units1&2

* NSECT	WSECT	HSECT	TUBEOD	TUBEID	ST	SL
* 11	49.167	49.0	2.250	1.05	5.0	14.0
* NTUBET	NTUBEL	ALEG	TUBEL	ILAT	EXTSRF	AWEFF
* 116	4	1.00	49.0	1	1.0	1.0
* HXTYPE	DTTUBE	PCTDFR	CLX	FC	UAF	ANGA
* 4	20.0	0.0	1.0	1.0	0.905	45.0
* F	DTWALL	DPSTM	ANGWL	PCTLEAK		
* 0.02	20.0	34.49	45.0	0.0		
REAR CAVITY						
-----CAVITY SECTION DATA-----						
* NSECT	WSECT	HSECT	DSECT	AWEFF	DTWALL	PCTLEAK
* 12	49.167	17.68	18.00	1.0	20.0	0.0
PRIMARY REHEATER						
-----CONVECTIVE SECTION DATA-----						
* NSECT	WSECT	HSECT	TUBEOD	TUBEID	ST	SL
* 13	49.167	24.78	2.500	2.177	5.0	4.5
* NTUBET	NTUBEL	ALEG	TUBEL	ILAT	EXTSRF	AWEFF
* 116	6	8.0	23.78	1	1.0	1.0
* HXTYPE	DTTUBE	PCTDFR	CLX	FC	UAF	ANGA
* 3	20.0	0.0	1.00	1.0	0.874	90.0
* F	DTWALL	DPSTM	ANGWL	PCTLEAK		
* 0.055	20.0	8.0	0.0	0.0		
ECONOMIZER						
-----CONVECTIVE SECTION DATA-----						
* NSECT	WSECT	HSECT	TUBEOD	TUBEID	ST	SL
* 14	49.167	24.78	1.750	1.315	1.875	4.50
* NTUBET	NTUBEL	ALEG	TUBEL	ILAT	EXTSRF	AWEFF

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclo Station Units 1&2

156	2	6.00	23.78	2	1.00	1.0
HXTYPE	DTTUBE	PCTDFR	CLX	FC	UAF	ANGA
3	20.0	0.0	0.8	1.0	0.752	90.0
F	DTWALL	DPSTM	ANGWL	PCTLEAK		
0.694	20.0	35.0	0.0	0.0		
-----GAS RECIRCULATION DATA-----*						
NSECT	PCTGS	KFGR	TGS			
15	40.00	1	597.00			
estimated based on actual FEGT						
-----AIR HEATER CONTROL DATA-----						
NSECT	NAH					
16	1					
SUPERHEATER SPRAY						
-----SPRAY SECTION DATA-----						
NSECT	PRES (PSIG)	TEMP (F)	MAX ALLOWABLE FLOW (LB/HR)			
17	2800.	340.	500000.			
REHEATER SPRAY						
-----SPRAY SECTION DATA-----						
NSECT	PRES (PSIG)	TEMP (F)	MAX ALLOWABLE FLOW (LB/HR)			
18	2800.	340.	200000.			
-----AIR HEATER SECTION DESCRIPTION-----						
MSECT	MATYPE	PCTAIR	PCTFG	MTITLE		
'AH1'	2	100.	100.	'BISECTOR HEATER'		
-----BISECTOR AIR HEATER DATA-----						
NASECT	"C"	"C1"	PCTLKG	TAI		
'AH1'	73.449	1.0	6.431	109.70		
*****WARNING*****						
**** IT IS IMPERATIVE THAT ALL AIR HEATER ****						
**** INPUTS BE BASED ON A VALID HEAT BALANCE. ****						

APPENDIX 3

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Ancote Station Units 1&2

PROGRESS ENERGY – ANCOTE UNIT # 1 & 2										
Detailed Performance Listing	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10
ELECTRICAL LOAD MWg		523	392	300	200		523	392	300	200
APPROXIMATE BOILER RATING PERCENT OF MCR	PEAK	98.85	75	57	40	PEAK	98.85	75	57	40
BOILER/FURNACE CONDITIONS										
FUEL TYPE	OIL	OIL	OIL	OIL	OIL	GAS	GAS	GAS	GAS	GAS
1. FURNACE										
MASS QUANTITIES PER 10,000 BTU FUEL INPUT										
FUEL BURNED (ASH FREE) LB	0.58	0.58	0.58	0.58	0.58	0.44	0.44	0.44	0.44	0.44
FUEL BURNED (AS FIRED) LB	0.58	0.58	0.58	0.58	0.58	0.44	0.44	0.44	0.44	0.44
DRY AIR LB	7.91	7.91	8.11	8.13	8.13	7.48	7.48	7.68	7.68	7.69
H2O IN AIR LB	0.1	0.1	0.11	0.11	0.11	0.1	0.1	0.1	0.1	0.1
H2O IN FUEL LB	0.52	0.52	0.52	0.52	0.52	0.95	0.95	0.95	0.95	0.95
H2O IN FLUE GAS, TOTAL LB	0.62	0.62	0.62	0.62	0.62	1.05	1.05	1.05	1.05	1.05
H2O IN FLUE GAS, % BY WGT %	7.21	7.21	7.07	7.06	7.06	13.08	13.08	12.79	12.79	12.77
DRY FLUE GAS, TOTAL LB	7.97	7.97	8.18	8.19	8.19	6.97	6.97	7.16	7.16	7.18
WET FLUE GAS, TOTAL LB	8.59	8.59	8.8	8.81	8.81	8.02	8.02	8.21	8.21	8.23
HEAT QUANTITIES PER 10,000 BTU FUEL INPUT										
HEAT INPUT FROM FUEL BTU	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
SENSIBLE HEAT FROM FUEL BTU	34.99	40.46	35.6	34.68	34.68	0	0	0	0	0
HEAT INPUT FROM AIR BTU	923.91	913.66	851.07	832.23	883.53	869.89	857.34	798	810.66	854.42
HEAT INPUT FROM FLUE GAS RECIRC. BTU	441.3	434.74	374.08	392.34	671.95	297.49	152.65	215.29	369.34	503.55
HEAT INPUT, TOTAL BTU	11400.2	11388.87	11260.75	11259.25	11590.16	11167.38	11009.99	11013.28	11180	11357.98
LESS LATENT HEAT LOSS BTU	-537.53	-537.53	-537.53	-537.53	-537.53	-989.26	-989.26	-989.26	-989.26	-989.26
HEAT AVAILABLE, MAXIMUM BTU	10862.67	10851.34	10723.22	10721.72	11052.63	10178.12	10020.73	10024.02	10190.74	10368.71
LESS LOSSES IN COMBUSTION ZONE. BTU	-59.5	-59.5	-59.5	-64.5	-64.5	-59.5	-59.5	-59.5	-59.5	-64.5
HEAT AVAILABLE. BTU	10803.17	10791.84	10663.72	10657.22	10988.13	10118.62	9961.23	9964.52	10131.24	10304.21

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units1&2

BOILER EFFICIENCY										
HEAT LOSS IN DRY GAS %	4.91	4.8	4.26	3.57	3.56	4.32	4.19	3.88	3.4	3.88
LATENT HEAT LOSS, H2O IN FUEL . %	5.38	5.38	5.38	5.38	5.38	9.89	9.89	9.89	9.89	9.89
HEAT LOSS FROM MOISTURE IN AIR . %	0.12	0.12	0.11	0.09	0.09	0.12	0.11	0.1	0.09	0.1
HEAT LOSS FROM UNBURNED CARBON . %	0	0	0	0	0	0	0	0	0	0
RADIATION(ABMA) LOSS. %	0.19	0.19	0.19	0.29	0.29	0.19	0.19	0.19	0.19	0.29
UNACCOUNTED LOSSES %	1	1	1	1	1	1	1	1	1	1
TOTAL LOSSES %	11.6	11.49	10.93	10.32	10.31	15.52	15.39	15.06	14.57	15.17
LESS HEAT CREDITS %	0	0	0	0	0	0	0	0	0	0
NET LOSSES %	11.6	11.49	10.93	10.32	10.31	15.52	15.39	15.06	14.57	15.17
EFFICIENCY(100 - NET LOSSES) . %	88.4	88.51	89.07	89.68	89.69	84.48	84.61	84.94	85.43	84.83
BOILER DATA										
FUEL FLOW LB/HR	282000	275748	217543	165751	114475	234045	215724	170172	131162	90561
COMBUSTION AIR FLOW LB/HR	3905837	3819243	3091461	2360106	1629992	4037503	3721441	3012000	2321534	1606061
FLUE GAS FLOW AT FURNACE EXIT LB/HR	5444188	5323488	4242144	3334132	2664673	5168574	4370253	3716777	3188506	2375271
TOTAL AIR INLEAKAGE LB/HR	0	0	0	0	0	0	0	0	0	0
FLUE GAS FLOW AT AIR HEATER LB/HR	4187837	4094991	3309004	2525857	1744467	4271549	3937165	3182172	2452697	1696622
GAS RECIRCULATION FLOW LB/HR	1256351	1228497	933139	808274	920206	897025	433088	534605	735809	678649
BOILER DUTY BTU/HR	4.31E+09	4.22E+09	3.35E+09	2.57E+09	1.78E+09	4.50E+09	4.15E+09	3.29E+09	2.55E+09	1.75E+09
CONVECTIVE DUTY BTU/HR	2.36E+09	2.30E+09	1.84E+09	1.41E+09	9.48E+08	2.56E+09	2.21E+09	1.81E+09	1.48E+09	9.49E+08
EVAPORATIVE DUTY BTU/HR	1.95E+09	1.92E+09	1.51E+09	1.16E+09	8.27E+08	1.94E+09	1.94E+09	1.48E+09	1.07E+09	7.99E+08
BLOWDOWN DUTY BTU/HR	8.73E+05	7.81E+05	6.72E+05	4.95E+05	3.76E+05	8.73E+05	8.04E+05	6.78E+05	4.73E+05	3.74E+05
HEAT INPUT BTU/HR	4.88E+09	4.77E+09	3.76E+09	2.87E+09	1.98E+09	5.33E+09	4.91E+09	3.87E+09	2.99E+09	2.06E+09
FURNACE EXIT GAS TEMPERATURE F	2184.41	2173	2122.15	2059.11	1869.27	2295.75	2315.77	2208.26	2133.65	1953.94
2. PLATEN SUPERHEATER										
INLET FLUE GAS CONDITIONS										
FLOW FROM UPSTREAM SECTION . LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Ancote Station Units 1&2

AIR INLEAKAGE FLOW LBM/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SECTION INLET FLOW LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
MASS FLOW LBM/SQFT-HR	3.31E+03	3.23E+03	2.58E+03	2.02E+03	1.62E+03	3.14E+03	2.65E+03	2.26E+03	1.94E+03	1.44E+03
TEMPERATURE F	2184.408	2173.003	2122.154	2059.108	1869.265	2295.749	2315.774	2208.263	2133.647	1953.935
ENTHALPY BTU/LBM	739.055	735.374	717.952	697.685	637.428	809.983	816.864	778.113	752.788	692.225
VELOCITY FT/SEC	60.817	59.212	46.293	35.497	26.231	63.815	54.35	44.39	37.016	25.662
OUTLET FLUE GAS CONDITIONS										
TEMPERATURE F	2099.125	2087.331	2027.399	1976.745	1802.019	2194.894	2202.508	2091.953	2037.939	1875.238
ENTHALPY BTU/LBM	711.594	707.807	687.637	671.441	616.285	775.463	778.061	738.692	720.498	666.025
VELOCITY FT/SEC	58.855	57.285	44.594	34.336	25.474	61.479	52.132	42.455	35.65	24.825
PRESSURE DROP IN-H2O	0.019	0.018	0.011	0.007	0.004	0.018	0.013	0.009	0.006	0.003
INLET STEAM CONDITIONS										
FLOW LBM/HR	3.75E+06	3.51E+06	2.55E+06	1.86E+06	1.27E+06	3.73E+06	3.50E+06	2.50E+06	1.75E+06	1.23E+06
MASS FLOW LBM/SQFT-HR	1.24E+06	1.16E+06	8.44E+05	6.16E+05	4.19E+05	1.23E+06	1.16E+06	8.25E+05	5.79E+05	4.06E+05
TEMPERATURE F	692.378	683.807	685.55	684.566	685.783	693.891	683.724	685.933	688.235	687.295
PRESSURE PSIA	2779.7	2591.41	2563.99	2444.91	2436.56	2779.7	2591.41	2563.99	2444.91	2436.56
ENTHALPY BTU/LBM	1100.759	1122.385	1133.355	1154.898	1159.037	1106.316	1122.145	1134.348	1162.648	1162.185
OUTLET STEAM CONDITIONS										
TEMPERATURE F	702.966	698.143	707.132	710.241	710.576	708.831	701.453	712.616	723.59	717.073
SATURATION TEMPERATURE F	681.704	670.91	669.923	664.214	663.71	681.704	670.91	669.923	664.214	663.71
PRESSURE PSIA	2739.7	2547.8	2530.85	2434.68	2426.33	2739.7	2547.8	2530.85	2434.68	2426.33
ENTHALPY BTU/LBM	1141.626	1165.256	1185.078	1203.539	1205.145	1155.33	1171.872	1194.586	1223.274	1214.924
SECTION DUTIES										
STEAM DUTY BTU/HR	1.53E+08	1.50E+08	1.32E+08	9.06E+07	5.84E+07	1.83E+08	1.74E+08	1.50E+08	1.06E+08	6.47E+07
UPSTREAM CAVITY RADIATION BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DOWNSTREAM CAVITY RADIATION BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DIRECT FURNACE RADIATION BTU/HR	5.66E+06	5.57E+06	5.12E+06	4.61E+06	3.28E+06	6.74E+06	6.95E+06	5.88E+06	5.21E+06	3.83E+06
CONVECTION TO STEAM BTU/HR	1.48E+08	1.45E+08	1.27E+08	8.60E+07	5.52E+07	1.76E+08	1.67E+08	1.44E+08	1.01E+08	6.09E+07

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclo Station Units1&2

HEAT TO THE WALL BTU/HR	2.00E+06	1.97E+06	1.73E+06	1.53E+06	1.17E+06	2.50E+06	2.43E+06	2.08E+06	1.89E+06	1.33E+06
GAS DUTY BTU/HR	1.50E+08	1.47E+08	1.29E+08	8.75E+07	5.63E+07	1.78E+08	1.70E+08	1.47E+08	1.03E+08	6.22E+07
CONVECTIVE HEAT TRANSFER DATA										
OVERALL HTC BTU/SQFT-HR-F	34.258	33.739	30.868	21.834	16.266	38.213	35.78	33.387	24.558	16.844
HTC ADJUSTMENT FACTOR, "UAF"	2.626	2.626	2.706	2.15	1.846	2.626	2.626	2.706	2.15	1.846
SECTION LMTD	1443.772	1438.894	1378.11	1320.328	1137.336	1543.565	1566.065	1450.37	1379.657	1212.24
WALL SAT TEMPERATURE	684.408	676.654	673.399	665.617	665.617	684.408	676.654	673.399	665.617	665.617
WALL LMTD	1456.942	1453.09	1400.841	1351.889	1169.703	1560.367	1581.809	1475.943	1419.636	1248.552
WALL HTC	8.501	8.395	7.647	7.01	6.184	9.951	9.531	8.755	8.27	6.587
COMPONENTS OF FLUE GAS CONVECTIVE CONDUCTANCE										
"UCCPRI"	87.758	86.566	75.369	65.071	56.756	85.02	76.749	69.529	63.322	52.912
"FPP"	0.142	0.142	0.141	0.14	0.137	0.15	0.151	0.148	0.147	0.144
"REYNO"	4524.363	4439.633	3572.281	2838.401	2352.437	4208.71	3555.324	3083.005	2674.251	2062.07
"FA"	0.729	0.728	0.717	0.707	0.701	0.725	0.716	0.71	0.705	0.697
"FD"	0.955	0.955	0.955	0.955	0.955	0.955	0.955	0.955	0.955	0.955
"CLX"	1	1	1	1	1	1	1	1	1	1
"UCG", CONVECTIVE CONDUCTANCE	8.681	8.533	7.265	6.148	5.199	8.856	7.906	6.997	6.28	5.071
COMPONENTS OF STEAM CONVECTIVE CONDUCTANCE										
"UCLPRI"	2702.407	2562.546	1987.108	1544.504	1135.363	2690.236	2559.016	1951.692	1471.335	1106.411
"FT"	0.959	0.959	0.959	0.959	0.959	0.959	0.959	0.959	0.959	0.959
"FPP"	0.599	0.568	0.55	0.523	0.52	0.589	0.564	0.544	0.509	0.514
"UCS", CONVECTIVE CONDUCTANCE	1206.31	1084.535	813.82	601.648	439.791	1180.848	1075.808	790.718	558.427	423.318
COMPONENTS OF INTERTUBE RADIATION CONDUCTANCE										
"URPRI"	11.223	11.13	10.855	10.554	9.573	11.799	11.833	11.275	10.959	10.018
"K"	0.456	0.456	0.451	0.45	0.45	0.566	0.566	0.558	0.558	0.483
"FS"	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
"URG", ITR CONDUCTANCE	5.123	5.08	4.893	4.753	4.311	6.68	6.699	6.293	6.117	4.836

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Ancote Station Units 1&2

3. PRIMARY SUPERHEATER										
INLET FLUE GAS CONDITIONS:										
FLOW FROM UPSTREAM SECTION LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
AIR INLEAKAGE FLOW LBM/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SECTION INLET FLOW LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
MASS FLOW LBM/SQFT-HR	4.74E+03	4.64E+03	3.69E+03	2.90E+03	2.32E+03	4.50E+03	3.81E+03	3.24E+03	2.78E+03	2.07E+03
TEMPERATURE F	2099.125	2087.326	2027.394	1976.74	1802.019	2194.889	2202.503	2091.948	2037.934	1875.229
ENTHALPY BTU/LBM	711.594	707.807	687.637	671.441	616.285	775.463	778.061	738.692	720.498	666.025
VELOCITY FT/SEC	84.409	82.157	63.956	49.244	36.534	88.172	74.767	60.888	51.128	35.604
OUTLET FLUE GAS CONDITIONS:										
TEMPERATURE F	1911.391	1900.55	1838.452	1782.352	1625.274	1986.828	1979.767	1879.948	1829.229	1678
ENTHALPY BTU/LBM	651.7	648.264	627.791	610.121	561.256	705.019	702.647	667.709	650.903	601.123
VELOCITY FT/SEC	78.216	76.133	59.097	45.315	33.679	81.261	68.511	55.829	46.856	32.596
PRESSURE DROP IN-H2O	0.074	0.071	0.044	0.026	0.016	0.069	0.05	0.034	0.025	0.013
INLET STEAM CONDITIONS:										
FLOW LBM/HR	3.75E+06	3.51E+06	2.55E+06	1.86E+06	1.27E+06	3.73E+06	3.50E+06	2.50E+06	1.75E+06	1.23E+06
MASS FLOW LBM/SQFT/HR	5.75E+05	5.38E+05	3.91E+05	2.86E+05	1.94E+05	5.72E+05	5.37E+05	3.83E+05	2.69E+05	1.88E+05
TEMPERATURE F	702.966	698.143	707.132	710.241	710.576	708.831	701.453	712.616	723.59	717.073
PRESSURE PSIA	2739.7	2547.8	2530.85	2434.68	2426.33	2739.7	2547.8	2530.85	2434.68	2426.33
ENTHALPY BTU/LBM	1141.626	1165.256	1185.078	1203.539	1205.145	1155.33	1171.872	1194.586	1223.274	1214.924
OUTLET STEAM CONDITIONS:										
TEMPERATURE F	751.57	760.066	787.547	814.752	823.365	771.901	770.792	805.302	860.728	849.385
SATURATION TEMPERATURE F	679.233	668.983	667.985	663.428	663.103	679.233	668.983	667.985	663.428	663.103
PRESSURE PSIA	2694.7	2514.8	2497.85	2421.68	2416.33	2694.7	2514.8	2497.85	2421.68	2416.33
ENTHALPY BTU/LBM	1233.785	1261.055	1291.512	1321.962	1329.774	1259.232	1272.929	1308.54	1360.207	1351.423
SECTION DUTIES:										
STEAM DUTY BTU/HR	3.45E+08	3.36E+08	2.72E+08	2.21E+08	1.58E+08	3.87E+08	3.54E+08	2.84E+08	2.40E+08	1.68E+08
UPSTREAM CAVITY RADIATION BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units1&2

DOWNSTREAM CAVITY RADIATION . BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DIRECT FURNACE RADIATION . BTU/HR	2.27E+07	2.23E+07	2.05E+07	1.84E+07	1.31E+07	2.69E+07	2.78E+07	2.35E+07	2.08E+07	1.53E+07
CONVECTION TO STEAM..... BTU/HR	3.23E+08	3.14E+08	2.51E+08	2.02E+08	1.45E+08	3.60E+08	3.26E+08	2.61E+08	2.19E+08	1.52E+08
HEAT TO THE WALL BTU/HR	3.31E+06	3.26E+06	2.74E+06	2.34E+06	1.75E+06	3.85E+06	3.58E+06	3.00E+06	2.70E+06	1.92E+06
GAS DUTY BTU/HR	3.26E+08	3.17E+08	2.54E+08	2.04E+08	1.47E+08	3.64E+08	3.30E+08	2.64E+08	2.22E+08	1.54E+08
CONVECTIVE HEAT TRANSFER DATA										
OVERALL HTC BTU/SQFT-HR-F	15.913	15.633	13.365	11.435	9.691	16.815	15.172	13.424	12.159	9.718
HTC ADJUSTMENT FACTOR, "UAF"	1.195	1.195	1.195	1.195	1.195	1.195	1.195	1.195	1.195	1.195
SECTION LMTD.....	1274.339	1260.75	1180.478	1110.391	939.267	1345.966	1349.754	1220.662	1132.638	984.226
WALL SAT TEMPERATURE ...	684.408	676.654	673.399	665.617	665.617	684.408	676.654	673.399	665.617	665.617
WALL LMTD	1318.623	1315.071	1257.158	1211.328	1045.538	1403.879	1411.55	1309.691	1265.097	1108.073
WALL HTC	7.855	7.754	6.825	6.046	5.245	8.584	7.93	7.165	6.684	5.41
COMPONENTS OF FLUE GAS CONVECTIVE CONDUCTANCE										
"UCCPRI"	98.486	97.149	84.583	73.026	63.694	95.414	86.132	78.029	71.063	59.38
"FPP"	0.14	0.14	0.139	0.139	0.136	0.148	0.148	0.146	0.146	0.143
"REYNO"	8668.801	8493.15	6826.757	5408.228	4467.058	8075.047	6833.94	5907.001	5088.973	3919.188
"FA"	0.787	0.785	0.752	0.72	0.699	0.78	0.752	0.731	0.713	0.686
"FD"	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985
"CLX"	1	1	1	1	1	1	1	1	1	1
"UCG", CONVECTIVE CONDUCTANCE...	10.714	10.527	8.729	7.179	5.955	10.866	9.46	8.226	7.282	5.73
COMPONENTS OF STEAM CONVECTIVE CONDUCTANCE										
"UCLPRI"	1393.674	1321.546	1024.783	796.525	585.525	1387.397	1319.725	1006.518	758.791	570.594
"FT"	0.968	0.968	0.968	0.968	0.969	0.968	0.968	0.968	0.969	0.969
"FPP"	0.55	0.511	0.486	0.46	0.456	0.527	0.502	0.474	0.441	0.445
"UCS", CONVECTIVE CONDUCTANCE .	559.88	493.905	364.176	268.167	195.305	534.373	484.032	349.269	244.823	185.892
COMPONENTS OF INTERTUBE RADIATION CONDUCTANCE										
"URPRI"	10.354	10.299	10.048	9.821	8.967	10.872	10.85	10.381	10.238	9.353
"K"	0.311	0.311	0.307	0.307	0.307	0.362	0.362	0.358	0.358	0.326

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Ancote Station Units 1&2

"FS"	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
"URG", ITR CONDUCTANCE	3.216	3.199	3.088	3.016	2.754	3.941	3.933	3.716	3.664	3.05
4. FINISHING SUPERHEATER										
INLET FLUE GAS CONDITIONS:										
FLOW FROM UPSTREAM SECTION LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
AIR INLEAKAGE FLOW LBM/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SECTION INLET FLOW LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
MASS FLOW LBM/SQFT-HR	5.14E+03	5.02E+03	4.00E+03	3.15E+03	2.51E+03	4.88E+03	4.12E+03	3.51E+03	3.01E+03	2.24E+03
TEMPERATURE F	1911.391	1900.545	1838.452	1782.347	1625.269	1986.823	1979.76	1879.948	1829.229	1678
ENTHALPY BTU/LBM	651.7	648.264	627.791	610.121	561.256	705.019	702.647	667.709	650.903	601.123
VELOCITY FT/SEC	84.739	82.482	64.026	49.094	36.488	88.038	74.225	60.485	50.763	35.315
OUTLET FLUE GAS CONDITIONS										
TEMPERATURE F	1492.076	1491.824	1389.114	1374.399	1303.707	1532.917	1501.806	1381.343	1381.381	1316.108
ENTHALPY BTU/LBM	521.036	520.958	489.104	484.615	463.356	555.413	545.387	505.813	505.825	485.147
VELOCITY FT/SEC	69.754	68.198	51.507	40.161	30.86	71.704	59.682	47.595	40.831	29.336
PRESSURE DROP IN-H2O	0.343	0.327	0.2	0.121	0.073	0.317	0.225	0.155	0.112	0.059
INLET STEAM CONDITIONS:										
FLOW LBM/HR	3.75E+06	3.51E+06	2.67E+06	1.99E+06	1.34E+06	3.75E+06	3.51E+06	2.67E+06	1.99E+06	1.34E+06
MASS FLOW LBM/SQFT/HR	7.97E+05	7.46E+05	5.69E+05	4.23E+05	2.85E+05	7.97E+05	7.46E+05	5.69E+05	4.23E+05	2.85E+05
TEMPERATURE F	751.57	760.066	746.62	750.777	766.385	767.318	769.252	742.789	732.87	756.518
PRESSURE PSIA	2694.7	2514.8	2497.85	2421.68	2416.33	2694.7	2514.8	2497.85	2421.68	2416.33
ENTHALPY BTU/LBM	1233.785	1261.055	1246.72	1258.662	1276.165	1253.787	1271.265	1241.965	1237.043	1265.566
OUTLET STEAM CONDITIONS:										
TEMPERATURE F	953.721	986.121	1005.19	1005.59	1006.63	1005	1004.99	1005.19	1005.59	1006.63
SATURATION TEMPERATURE F	676.445	663.92	665.007	662.089	661.272	676.445	663.92	665.007	662.089	661.272
PRESSURE PSIA	2644.7	2429.8	2447.85	2399.68	2386.33	2644.7	2429.8	2447.85	2399.68	2386.33
ENTHALPY BTU/LBM	1420.077	1450.564	1462.74	1464.608	1465.739	1456.007	1463.208	1462.74	1464.608	1465.739

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

SECTION DUTIES										
STEAM DUTY BTU/HR	6.98E+08	6.65E+08	5.78E+08	4.09E+08	2.54E+08	7.58E+08	6.73E+08	5.91E+08	4.52E+08	2.68E+08
UPSTREAM CAVITY RADIATION . BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DOWNSTREAM CAVITY RADIATION . BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DIRECT FURNACE RADIATION . . BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CONVECTION TO STEAM. . . . BTU/HR	6.98E+08	6.65E+08	5.78E+08	4.09E+08	2.54E+08	7.58E+08	6.73E+08	5.91E+08	4.52E+08	2.68E+08
HEAT TO THE WALL. BTU/HR	1.31E+07	1.31E+07	1.05E+07	9.19E+06	7.14E+06	1.53E+07	1.41E+07	1.12E+07	1.04E+07	7.56E+06
GAS DUTY BTU/HR	7.11E+08	6.78E+08	5.88E+08	4.18E+08	2.61E+08	7.73E+08	6.87E+08	6.02E+08	4.63E+08	2.75E+08
CONVECTIVE HEAT TRANSFER DATA										
OVERALL HTC BTU/SQFT-HR-F	15.868	15.672	15.699	11.683	8.819	16.887	15.458	15.806	12.374	8.796
HTC ADJUSTMENT FACTOR, "UAF"	0.964	0.964	1.117	0.956	0.836	0.964	0.964	1.117	0.956	0.836
SECTION LMTD.	809.719	780.568	677.256	644.221	529.112	825.904	801.372	687.888	672.979	560.908
WALL SAT TEMPERATURE	684.408	676.654	673.399	665.617	665.617	684.408	676.654	673.399	665.617	665.617
WALL LMTD	1002.753	1005.723	922.208	897.351	787.962	1059.3	1045.988	935.198	921.624	818.14
WALL HTC	9.707	9.639	8.177	7.594	6.723	10.726	9.985	8.901	8.335	6.853
COMPONENTS OF FLUE GAS CONVECTIVE CONDUCTANCE										
"UCCPRI"	104.207	102.792	89.496	77.268	67.394	100.956	91.135	82.562	75.191	62.829
"FPP"	0.137	0.137	0.135	0.135	0.133	0.144	0.143	0.14	0.14	0.138
"REYNO"	9613.918	9378.344	7625.284	6028.743	4919.918	8973.969	7622.841	6671.602	5752.611	4365.197
"FA"	0.949	0.948	0.938	0.919	0.906	0.946	0.938	0.927	0.916	0.899
"FD"	1	1	1	1	1	1	1	1	1	1
"CLX"	1	1	1	1	1	1	1	1	1	1
"UCG", CONVECTIVE CONDUCTANCE	13.516	13.339	11.34	9.555	8.107	13.752	12.266	10.747	9.638	7.807
COMPONENTS OF STEAM CONVECTIVE CONDUCTANCE										
"UCLPRI"	1870.354	1773.555	1427.899	1125.842	820.635	1870.354	1773.555	1427.899	1125.842	820.635
"FT"	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971
"FPP"	0.433	0.415	0.414	0.409	0.407	0.422	0.412	0.414	0.411	0.408
"UCS", CONVECTIVE CONDUCTANCE	514.219	467.864	375.157	292.381	212.085	501.574	464.145	375.588	293.841	212.608

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

COMPONENTS OF INTERTUBE RADIATION CONDUCTANCE										
"URPRI"	9 128	9 165	8 642	8 486	7 943	9 53	9 407	8,68	8 559	8.071
"K"	0 382	0 382	0 377	0 377	0 377	0 462	0 462	0 456	0 456	0 404
"FS"	1	1	1	1	1	1	1	1	1	1
"URG", ITR CONDUCTANCE	3 489	3 503	3 261	3 199	2 994	4 4	4,343	3 957	3 902	3,262
5. FINISHING REHEATER										
INLET FLUE GAS CONDITIONS										
FLOW FROM UPSTREAM SECTION LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
AIR INLEAKAGE FLOW LBM/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SECTION INLET FLOW LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
MASS FLOW LBM/SQFT-HR	5.21E+03	5.09E+03	4.06E+03	3.19E+03	2.55E+03	4.94E+03	4.18E+03	3.56E+03	3.05E+03	2.27E+03
TEMPERATURE F	1492.071	1491.817	1389.109	1374.394	1303.701	1532.911	1501.799	1381.343	1381.381	1316.108
ENTHALPY BTU/LBM	521.036	520.958	489.104	484.615	463.356	555.413	545.387	505.813	505.825	485.147
VELOCITY FT/SEC	70.715	69.138	52.217	40.715	31.286	72.692	60.504	48.251	41.394	29.741
OUTLET FLUE GAS CONDITIONS:										
TEMPERATURE F	1276.853	1274.367	1175.064	1208.679	1192.53	1291.442	1259.76	1153.564	1212.704	1198.678
ENTHALPY BTU/LBM	455.892	455.149	425.142	435.045	430.267	478.456	468.512	434.61	452.906	448.487
VELOCITY FT/SEC	62.917	61.434	46.172	37.036	29.313	63.883	53.038	42.281	37.601	27.774
PRESSURE DROP IN-H ₂ O	0.216	0.206	0.124	0.077	0.048	0.198	0.139	0.094	0.071	0.038
INLET STEAM CONDITIONS										
FLOW LBM/HR	3.33E+06	3.20E+06	2.43E+06	1.81E+06	1.22E+06	3.42E+06	3.13E+06	2.38E+06	1.77E+06	1.19E+06
MASS FLOW LBM/SQFT-HR	2.62E+05	2.52E+05	1.91E+05	1.43E+05	9.63E+04	2.70E+05	2.46E+05	1.88E+05	1.39E+05	9.39E+04
TEMPERATURE F	804.099	798.714	789.868	791.682	795.968	785.233	800.791	780.593	803.848	805.509
PRESSURE PSIA	574.7	553.19	424.48	316.91	211.47	574.7	553.19	424.48	316.91	211.47
ENTHALPY BTU/LBM	1411.642	1409.641	1410.56	1416.225	1422.95	1401.249	1410.779	1405.597	1422.595	1427.854
OUTLET STEAM CONDITIONS										
TEMPERATURE F	999.413	1000	999.39	966.9	938.46	1000	1000	989.952	988.465	950.233

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

SATURATION TEMPERATURE . F	477.074	472.895	448.569	420.039	383.249	477.074	472.895	448.569	420.039	383.249
PRESSURE PSIA	550.7	529.19	416.48	308.91	203.47	550.7	529.19	416.48	308.91	203.47
ENTHALPY BTU/LBM	1518.513	1519.464	1522.446	1508.423	1496.849	1518.831	1519.464	1517.402	1519.813	1502.977
SECTION DUTIES										
STEAM DUTY BTU/HR	3.56E+08	3.52E+08	2.72E+08	1.67E+08	9.03E+07	4.03E+08	3.40E+08	2.66E+08	1.72E+08	8.96E+07
UPSTREAM CAVITY RADIATION . BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DOWNSTREAM CAVITY RADIATION . BTU/HR	7.61E+06	7.58E+06	4.89E+06	5.95E+06	5.69E+06	1.16E+07	1.00E+07	6.35E+06	8.03E+06	6.11E+06
DIRECT FURNACE RADIATION . BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CONVECTION TO STEAM BTU/HR	3.49E+08	3.44E+08	2.67E+08	1.61E+08	8.47E+07	3.91E+08	3.30E+08	2.60E+08	1.64E+08	8.35E+07
HEAT TO THE WALL BTU/HR	6.06E+06	6.05E+06	4.54E+06	4.20E+06	3.51E+06	6.76E+06	6.05E+06	4.54E+06	4.62E+06	3.60E+06
GAS DUTY BTU/HR	3.55E+08	3.50E+08	2.71E+08	1.65E+08	8.82E+07	3.98E+08	3.36E+08	2.65E+08	1.69E+08	8.71E+07
CONVECTIVE HEAT TRANSFER DATA										
OVERALL HTC BTU/SQFT-HR-F	17.628	17.374	16.804	9.535	5.428	18.372	16.771	16.613	9.993	5.371
HTC ADJUSTMENT FACTOR, "UAF"	1.201	1.201	1.355	0.889	0.589	1.201	1.201	1.355	0.889	0.589
SECTION LMTD	482.63	483.64	387.434	412.205	380.684	519.414	480.056	382.091	400.817	379.342
WALL SAT TEMPERATURE	684.408	676.654	673.399	665.617	665.617	684.408	676.654	673.399	665.617	665.617
WALL LMTD	694.505	700.827	602.358	622.243	580.726	721.042	697.137	586.704	627.653	589.829
WALL HTC	8.784	8.687	7.594	6.802	6.082	9.441	8.739	7.791	7.407	6.151
COMPONENTS OF FLUE GAS CONVECTIVE CONDUCTANCE										
"UCCPRI"	104.286	102.869	89.564	77.326	67.445	101.033	91.204	82.624	75.248	62.877
"FPP"	0.133	0.133	0.131	0.13	0.129	0.138	0.138	0.135	0.136	0.134
"REYNO"	10426.849	10203.789	8320.283	6547.858	5298.139	9859.684	8379.546	7328.646	6231.202	4701.751
"FA"	0.942	0.941	0.932	0.911	0.896	0.939	0.932	0.921	0.907	0.888
"FD"	1	1	1	1	1	1	1	1	1	1
"CLX"	1	1	1	1	1	1	1	1	1	1
"UCG", CONVECTIVE CONDUCTANCE	13.027	12.829	10.894	9.195	7.818	13.099	11.693	10.258	9.257	7.501
COMPONENTS OF STEAM CONVECTIVE CONDUCTANCE										
"UCLPRI"	725.078	702.451	562.748	445.132	325.024	740.805	689.097	554.414	437.134	318.63

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Ancote Station Units 1&2

"FT"	0.986	0.986	0.985	0.985	0.985	0.985	0.986	0.985	0.985	0.985
"FPP"	0.331	0.33	0.326	0.321	0.317	0.33	0.33	0.325	0.323	0.318
"UCS", CONVECTIVE CONDUCTANCE	203.574	196.704	155.501	121.197	87.263	207.506	193.015	152.775	119.671	85.866
COMPONENTS OF INTERTUBE RADIATION CONDUCTANCE										
"URPRI"	7.42	7.405	6.952	6.932	6.699	7.52	7.398	6.853	7.022	6.781
"K"	0.376	0.376	0.371	0.371	0.371	0.454	0.454	0.448	0.448	0.398
"FS"	1	1	1	1	1	1	1	1	1	1
"URG", ITR CONDUCTANCE	2.792	2.786	2.582	2.572	2.486	3.416	3.361	3.073	3.149	2.701
6. FORWARD CAVITY										
INLET FLUE GAS CONDITIONS										
FLOW FROM UPSTREAM SECTION, LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
AIR INLEAKAGE FLOW, LBM/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SECTION INLET FLOW, LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
TEMPERATURE, F	1276.853	1274.372	1175.056	1208.674	1192.53	1291.442	1259.76	1153.564	1212.704	1198.678
ENTHALPY, BTU/LBM	455.892	455.149	425.142	435.045	430.267	478.456	468.512	434.61	452.906	448.487
OUTLET FLUE GAS CONDITIONS										
TEMPERATURE, F	1257.516	1254.587	1156.742	1182.679	1161.531	1262.661	1228.62	1127.07	1176.101	1162.203
ENTHALPY, BTU/LBM	450.113	449.239	419.747	427.358	421.122	469.421	458.776	426.46	441.566	437.21
SECTION DUTIES										
RAD TO UPSTREAM SECTION, BTU/HR	7.61E+06	7.58E+06	4.89E+06	5.95E+06	5.69E+06	1.16E+07	1.00E+07	6.35E+06	8.03E+06	6.11E+06
RAD TO DOWNSTREAM SECTION, BTU/HR	1.25E+07	1.26E+07	9.45E+06	1.03E+07	9.79E+06	1.85E+07	1.71E+07	1.26E+07	1.47E+07	1.08E+07
RAD TO THE WALL, BTU/HR	1.13E+07	1.13E+07	8.56E+06	9.37E+06	8.90E+06	1.66E+07	1.54E+07	1.14E+07	1.34E+07	9.85E+06
GAS DUTY, BTU/HR	3.15E+07	3.15E+07	2.29E+07	2.56E+07	2.44E+07	4.67E+07	4.26E+07	3.03E+07	3.62E+07	2.68E+07
7. SUPERHEATER STRINGER TUBES										
INLET FLUE GAS CONDITIONS										
FLOW FROM UPSTREAM SECTION, LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

AIR INLEAKAGE FLOW. LBM/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SECTION INLET FLOW. LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
MASS FLOW. LBM/SQFT-HR	2.77E+03	2.71E+03	2.16E+03	2.42E+03	1.36E+03	2.63E+03	2.22E+03	1.89E+03	2.32E+03	1.21E+03
TEMPERATURE. F	1257.521	1254.592	1156.747	1182.684	1161.536	1262.661	1228.62	1127.07	1176.101	1162.208
ENTHALPY. BTU/LBM	450.113	449.239	419.747	427.358	421.122	469.421	458.776	426.46	441.566	437.21
VELOCITY. FT/SEC	33.091	32.302	24.282	27.688	15.298	33.418	27.698	22.118	27.931	14.447
OUTLET FLUE GAS CONDITIONS:										
TEMPERATURE. F	1163.834	1159.248	1060.292	1083.496	1073.572	1159.891	1121.636	1024.566	1073.905	1067.43
ENTHALPY. BTU/LBM	422.3	420.947	391.534	398.255	395.364	437.421	425.62	395.2	410.191	408.159
VELOCITY. FT/SEC	31.285	30.505	22.833	26.016	14.468	31.424	25.943	20.69	26.186	13.603
PRESSURE DROP. IN-H2O	0.003	0.003	0.002	0.005	0.001	0.003	0.002	0.001	0.005	0.001
INLET STEAM CONDITIONS:										
FLOW. LBM/HR	3.75E+06	3.51E+06	2.55E+06	1.86E+06	1.27E+06	3.73E+06	3.50E+06	2.50E+06	1.75E+06	1.23E+06
MASS FLOW. LBM/SQFT/HR	9.04E+05	8.46E+05	6.16E+05	4.49E+05	3.06E+05	8.99E+05	8.45E+05	6.02E+05	4.23E+05	2.96E+05
TEMPERATURE. F	684.408	676.654	673.399	665.617	665.617	684.408	676.654	673.399	665.617	665.617
PRESSURE. PSIA	2789.7	2648.41	2590.99	2458.02	2458.02	2789.7	2648.41	2590.99	2458.02	2458.02
ENTHALPY. BTU/LBM	1057.344	1076.209	1083.1	1097.792	1097.792	1057.344	1076.209	1083.1	1097.792	1097.792
OUTLET STEAM CONDITIONS:										
TEMPERATURE. F	692.378	683.807	685.55	684.566	685.783	693.891	683.724	685.933	688.235	687.295
SATURATION TEMPERATURE. F	683.871	673.423	671.847	664.831	664.328	683.871	673.423	671.847	664.831	664.328
PRESSURE. PSIA	2779.7	2591.41	2563.99	2444.91	2436.56	2779.7	2591.41	2563.99	2444.91	2436.56
ENTHALPY. BTU/LBM	1100.759	1122.385	1133.355	1154.898	1159.037	1106.316	1122.145	1134.348	1162.648	1162.185
SECTION DUTIES										
STEAM DUTY. BTU/HR	1.63E+08	1.62E+08	1.28E+08	1.06E+08	7.76E+07	1.82E+08	1.61E+08	1.28E+08	1.14E+08	7.90E+07
UPSTREAM CAVITY RADIATION. BTU/HR	1.25E+07	1.26E+07	9.45E+06	1.03E+07	9.79E+06	1.85E+07	1.71E+07	1.26E+07	1.47E+07	1.08E+07
DOWNSTREAM CAVITY RADIATION. BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DIRECT FURNACE RADIATION. BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CONVECTION TO STEAM. BTU/HR	1.50E+08	1.49E+08	1.19E+08	9.60E+07	6.78E+07	1.64E+08	1.44E+08	1.15E+08	9.90E+07	6.82E+07

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

HEAT TO THE WALL BTU/HR	1.24E+06	1.23E+06	8.87E+05	1.00E+06	7.85E+05	1.36E+06	1.19E+06	8.63E+05	1.08E+06	7.91E+05
GAS DUTY BTU/HR	1.51E+08	1.51E+08	1.20E+08	9.70E+07	6.86E+07	1.65E+08	1.45E+08	1.16E+08	1.00E+08	6.90E+07
CONVECTIVE HEAT TRANSFER DATA										
OVERALL HTC BTU/SQFT-HR-F	17.574	17.335	16.938	12.818	9.382	19.206	17.765	17.827	13.503	9.51
HTC ADJUSTMENT FACTOR, "UAF"	2.539	2.539	2.827	1.197	1.846	2.539	2.539	2.827	1.197	1.846
SECTION LMTD	521.11	525.457	427.661	456.827	440.987	520.733	493.254	394.443	446.897	437.346
WALL SAT TEMPERATURE	684.408	676.654	673.399	665.617	665.617	684.408	676.654	673.399	665.617	665.617
WALL LMTD	524.876	528.834	433.333	465.714	450.507	525.19	496.554	400.234	457.485	447.53
WALL HTC	6.952	6.861	6.027	6.341	5.132	7.602	7.032	6.347	6.939	5.205
COMPONENTS OF FLUE GAS CONVECTIVE CONDUCTANCE										
"UCCPRI"	81.275	80.171	69.801	74.889	52.563	78.74	71.08	64.393	72.877	49.003
"FPP"	0.126	0.125	0.124	0.124	0.124	0.13	0.129	0.127	0.128	0.127
"REYNO"	4276.217	4193.821	3426.249	3825.291	2149.022	4058.595	3470.631	3027.175	3664.005	1916.658
"FA"	0.949	0.949	0.945	0.947	0.937	0.948	0.945	0.942	0.946	0.937
"FD"	0.955	0.955	0.955	0.955	0.955	0.955	0.955	0.955	0.955	0.955
"CLX"	1	1	1	1	1	1	1	1	1	1
"UCG", CONVECTIVE CONDUCTANCE	4.256	4.189	3.578	8.39	2.676	4.254	3.8	3.377	8.401	2.569
COMPONENTS OF STEAM CONVECTIVE CONDUCTANCE										
"UCLPRI"	2181.393	2068.497	1604.001	1246.729	916.469	2171.568	2065.647	1575.413	1187.667	893.099
"FT"	0.991	0.991	0.991	0.991	0.991	0.991	0.991	0.991	0.991	0.991
"FPP"	1.034	0.97	0.912	0.826	0.821	1.014	0.97	0.91	0.811	0.814
"UCS", CONVECTIVE CONDUCTANCE	1557.584	1385.271	1009.995	710.968	519.412	1521.164	1384.197	989.593	664.926	502.348
COMPONENTS OF INTERTUBE RADIATION CONDUCTANCE										
"URPRI"	5.587	5.537	5.142	5.217	5.162	5.592	5.398	5.017	5.194	5.154
"K"	0.483	0.483	0.476	0.476	0.476	0.599	0.599	0.592	0.592	0.511
"FS"	1	1	1	1	1	1	1	1	1	1
"URG", ITR CONDUCTANCE	2.696	2.672	2.449	2.482	2.456	3.348	3.232	2.97	3.075	2.636

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units1&2

8. FORWARD VERTICAL REHEATER										
INLET FLUE GAS CONDITIONS										
FLOW FROM UPSTREAM SECTION LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
AIR INLEAKAGE FLOW LBM/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SECTION INLET FLOW LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
MASS FLOW LBM/SQFT-HR	1.85E+04	1.80E+04	1.44E+04	1.13E+04	9.03E+03	1.75E+04	1.48E+04	1.26E+04	1.08E+04	8.05E+03
TEMPERATURE F	1163.834	1159.248	1060.292	1083.496	1073.572	1159.886	1121.636	1024.566	1073.905	1067.43
ENTHALPY BTU/LBM	422.3	420.947	391.534	398.255	395.364	437.421	425.62	395.2	410.191	408.159
VELOCITY FT/SEC	208.469	203.271	152.146	121.409	96.407	209.394	172.871	137.864	122.201	90.642
OUTLET FLUE GAS CONDITIONS										
TEMPERATURE F	1139.23	1134.427	1043.175	1081.223	1059.526	1134.004	1097.887	1008.654	1071.754	1053.716
ENTHALPY BTU/LBM	415.052	413.637	386.563	397.593	391.278	429.429	418.325	390.387	409.535	403.988
VELOCITY FT/SEC	205.31	200.155	150.432	121.23	95.524	206.048	170.274	136.386	122.029	89.828
PRESSURE DROP IN-H2O	0.651	0.62	0.371	0.234	0.148	0.585	0.409	0.278	0.212	0.117
INLET STEAM CONDITIONS										
FLOW LBM/HR	3.33E+06	3.20E+06	2.43E+06	1.81E+06	1.22E+06	3.42E+06	3.13E+06	2.38E+06	1.77E+06	1.19E+06
MASS FLOW LBM/SQFT-HR	1.81E+05	1.74E+05	1.32E+05	9.82E+04	6.63E+04	1.86E+05	1.70E+05	1.29E+05	9.60E+04	6.47E+04
TEMPERATURE F	783.712	777.735	774.482	790.312	779.752	764.579	783.267	767.365	802.548	790.433
PRESSURE PSIA	581.7	560.19	428.48	320.91	215.47	581.7	560.19	428.48	320.91	215.47
ENTHALPY BTU/LBM	1400.083	1397.785	1402.139	1415.334	1414.444	1389.458	1400.836	1398.317	1421.745	1419.935
OUTLET STEAM CONDITIONS										
TEMPERATURE F	804.099	798.714	789.868	791.682	795.968	785.233	800.791	780.593	803.848	805.509
SATURATION TEMPERATURE F	481.593	477.55	450.452	422.405	386.506	481.593	477.55	450.452	422.405	386.506
PRESSURE PSIA	574.7	553.19	424.48	316.91	211.47	574.7	553.19	424.48	316.91	211.47
ENTHALPY BTU/LBM	1411.642	1409.641	1410.56	1416.225	1422.95	1401.249	1410.779	1405.597	1422.595	1427.854
SECTION DUTIES										
STEAM DUTY BTU/HR	3.85E+07	3.80E+07	2.04E+07	1.61E+06	1.04E+07	4.04E+07	3.11E+07	1.73E+07	1.50E+06	9.44E+06
UPSTREAM CAVITY RADIATION BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

DOWNSTREAM CAVITY RADIATION, BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DIRECT FURNACE RADIATION, BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CONVECTION TO STEAM, BTU/HR	3.85E+07	3.80E+07	2.04E+07	1.61E+06	1.04E+07	4.04E+07	3.11E+07	1.73E+07	1.50E+06	9.44E+06
HEAT TO THE WALL, BTU/HR	9.36E+05	9.28E+05	6.37E+05	5.94E+05	4.89E+05	9.32E+05	7.84E+05	5.41E+05	5.86E+05	4.63E+05
GAS DUTY, BTU/HR	3.95E+07	3.89E+07	2.11E+07	2.21E+06	1.09E+07	4.13E+07	3.19E+07	1.79E+07	2.09E+06	9.91E+06
CONVECTIVE HEAT TRANSFER DATA										
OVERALL HTC, BTU/SQFT-HR-F	19.712	19.38	13.874	1.014	6.824	19.854	17.909	13.08	1.02	6.582
HTC ADJUSTMENT FACTOR, "UAF"	1.172	1.172	0.994	0.087	0.699	1.172	1.172	0.994	0.087	0.699
SECTION LMTD	357.618	358.558	269.538	291.354	278.685	372.005	317.72	242.613	269.615	262.593
WALL SAT TEMPERATURE	684.408	676.654	673.399	665.617	665.617	684.408	676.654	673.399	665.617	665.617
WALL LMTD	467.018	470.074	378.267	416.741	400.888	462.416	433.001	343.15	407.211	394.919
WALL HTC	18.998	18.724	15.964	13.511	11.571	19.105	17.17	14.961	13.648	11.121
COMPONENTS OF FLUE GAS CONVECTIVE CONDUCTANCE										
"UCCPRI"	211.783	208.907	181.886	157.033	136.967	205.177	185.217	167.793	152.813	127.69
"FPP"	0.126	0.126	0.124	0.125	0.125	0.13	0.13	0.127	0.129	0.129
"REYNO"	40000	40000	37599.179	29261.541	23496.86	40000	38085.858	33304.864	27964.851	20923.237
"FA"	0.69	0.69	0.682	0.652	0.632	0.69	0.683	0.667	0.648	0.623
"FD"	0.955	0.955	0.955	0.955	0.955	0.955	0.955	0.955	0.955	0.955
"CLX"	1	1	1	1	1	1	1	1	1	1
"UCG", CONVECTIVE CONDUCTANCE	17.643	17.378	14.726	12.238	10.316	17.598	15.684	13.608	12.206	9.784
COMPONENTS OF STEAM CONVECTIVE CONDUCTANCE										
"UCLPRI"	518.308	502.134	402.27	318.194	232.338	529.551	492.588	396.313	312.477	227.767
"FT"	0.992	0.992	0.992	0.992	0.992	0.992	0.992	0.992	0.992	0.992
"FPP"	0.323	0.322	0.316	0.312	0.307	0.323	0.322	0.315	0.313	0.308
"UCS", CONVECTIVE CONDUCTANCE	146.621	141.49	111.09	86.776	62.446	149.463	138.875	109.26	85.508	61.42
COMPONENTS OF INTERTUBE RADIATION CONDUCTANCE										
"URPRI"	5.804	5.762	5.355	5.513	5.437	5.707	5.628	5.183	5.522	5.453
"K"	0.234	0.234	0.231	0.231	0.231	0.264	0.264	0.261	0.261	0.245

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

"FS"	1	1	1	1	1	1	1	1	1	1
"URG", ITR CONDUCTANCE ..	1 355	1 346	1 237	1.273	1 255	1 507	1 486	1 353	1 441	1 337
9. SCREEN										
INLET FLUE GAS CONDITIONS:										
FLOW FROM UPSTREAM SECTION LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
AIR INLEAKAGE FLOW..... LBM/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SECTION INLET FLOW.....LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
MASS FLOW..... LBM/SQFT-HR	8.14E+03	7.96E+03	6.34E+03	4.99E+03	3.99E+03	7.73E+03	6.54E+03	5.56E+03	4.77E+03	3.55E+03
TEMPERATURE.....F	1139.235	1134.427	1043.17	1081.223	1059.521	1134.004	1097.892	1008.654	1071.754	1053.721
ENTHALPY..... BTU/LBM	415.052	413.637	386.563	397.593	391.278	429.429	418.325	390.387	409.535	403.988
VELOCITY..... FT/SEC	90.578	88.304	66.367	53.484	42.143	90.904	75.121	60.17	53.837	39.63
OUTLET FLUE GAS CONDITIONS										
TEMPERATURE..... F	1128.185	1123.229	1033.331	1068.916	1046.618	1122.702	1086.574	999.089	1059.235	1040.439
ENTHALPY..... BTU/LBM	411.805	410.348	383.714	394.011	387.534	425.948	414.857	387.499	405.723	399.954
VELOCITY..... FT/SEC	89.952	87.683	65.933	53.057	41.785	90.259	74.575	59.778	53.396	39.282
PRESSURE DROP.....IN-H2O	0.061	0.058	0.035	0.022	0.014	0.055	0.038	0.026	0.02	0.011
INLET STEAM CONDITIONS:										
FLOW..... LBM/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MASS FLOW..... LBM/SQFT/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEMPERATURE.....F	684.408	676.654	673.399	665.617	665.617	684.408	676.654	673.399	665.617	665.617
PRESSURE..... PSIA	0	0	0	0	0	0	0	0	0	0
ENTHALPY.....BTU/LBM	0	0	0	0	0	0	0	0	0	0
OUTLET STEAM CONDITIONS										
TEMPERATURE..... F	684.408	676.654	673.399	665.617	665.617	684.408	676.654	673.399	665.617	665.617
SATURATION TEMPERATURE.....F	0	0	0	0	0	0	0	0	0	0
PRESSURE..... PSIA	0	0	0	0	0	0	0	0	0	0
ENTHALPY..... BTU/LBM	0	0	0	0	0	0	0	0	0	0

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

SECTION DUTIES										
STEAM DUTY BTU/HR	1.67E+07	1.65E+07	1.14E+07	1.13E+07	9.42E+06	1.70E+07	1.43E+07	1.01E+07	1.15E+07	9.05E+06
UPSTREAM CAVITY RADIATION BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DOWNSTREAM CAVITY RADIATION BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DIRECT FURNACE RADIATION BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CONVECTION TO STEAM. . . BTU/HR	1.67E+07	1.65E+07	1.14E+07	1.13E+07	9.42E+06	1.70E+07	1.43E+07	1.01E+07	1.15E+07	9.05E+06
HEAT TO THE WALL BTU/HR	9.88E+05	9.78E+05	6.76E+05	6.68E+05	5.58E+05	1.01E+06	8.47E+05	6.00E+05	6.79E+05	5.35E+05
GAS DUTY BTU/HR	1.77E+07	1.75E+07	1.21E+07	1.19E+07	9.98E+06	1.80E+07	1.52E+07	1.07E+07	1.22E+07	9.58E+06
CONVECTIVE HEAT TRANSFER DATA										
OVERALL HTC BTU/SQFT-HR-F	17.995	17.707	15.154	13.341	11.778	18.529	16.678	14.85	13.898	11.483
HTC ADJUSTMENT FACTOR, "UAF"	1	1	1	1	1	1	1	1	1	1
SECTION LMTD	449.282	452.151	364.832	409.424	387.419	443.921	415.556	330.449	399.845	381.425
WALL SAT TEMPERATURE	684.408	676.654	673.399	665.617	665.617	684.408	676.654	673.399	665.617	665.617
WALL LMTD	449.282	452.151	364.832	409.424	387.419	443.921	415.556	330.449	399.845	381.425
WALL HTC	17.995	17.707	15.154	13.341	11.778	18.529	16.678	14.85	13.898	11.483
COMPONENTS OF FLUE GAS CONVECTIVE CONDUCTANCE										
"UCCPRI"	140.249	138.344	120.45	103.992	90.703	135.874	122.656	111.118	101.197	84.56
"FPP"	0.124	0.124	0.122	0.123	0.122	0.128	0.127	0.125	0.126	0.126
"REYNO"	17098.452	16772.8	13690.549	10679.866	8584.011	16254.797	13898.008	12102.807	10238.606	7663.603
"FA"	0.965	0.964	0.948	0.933	0.923	0.961	0.949	0.941	0.931	0.913
"FD"	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
"CLX"	1	1	1	1	1	1	1	1	1	1
"UCG", CONVECTIVE CONDUCTANCE	15.298	15.037	12.702	10.838	9.317	15.212	13.471	11.899	10.823	8.843
COMPONENTS OF INTERTUBE RADIATION CONDUCTANCE										
"URPRI"	5.265	5.212	4.853	4.959	4.875	5.245	5.073	4.723	4.922	4.853
"K"	0.512	0.512	0.505	0.505	0.505	0.632	0.632	0.625	0.625	0.544
"FS"	1	1	1	1	1	1	1	1	1	1
"URG", ITR CONDUCTANCE	2.697	2.67	2.452	2.503	2.461	3.316	3.207	2.95	3.075	2.641

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

10. REAR VERTICAL REHEATER										
INLET FLUE GAS CONDITIONS										
FLOW FROM UPSTREAM SECTION . LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
AIR INLEAKAGE FLOW .LBM/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SECTION INLET FLOW LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
MASS FLOW LBM/SQFT-HR	1.30E+04	1.27E+04	1.02E+04	7.98E+03	6.38E+03	1.24E+04	1.05E+04	8.89E+03	7.63E+03	5.68E+03
TEMPERATURE F	1128.19	1123.229	1033.336	1068.921	1046.623	1122.702	1086.579	999.089	1059.235	1040.439
ENTHALPY BTU/LBM	411.805	410.348	383.714	394.011	387.534	425.948	414.857	387.499	405.723	399.954
VELOCITY FT/SEC	143.924	140.293	105.492	84.891	66.856	144.414	119.321	95.645	85.434	62.852
OUTLET FLUE GAS CONDITIONS										
TEMPERATURE F	1103.538	1098.379	1016.044	1039.638	1023.394	1096.885	1063.175	982.922	1031.86	1018.238
ENTHALPY BTU/LBM	404.575	403.065	378.712	385.507	380.806	418.016	407.703	382.628	397.411	393.23
VELOCITY FT/SEC	141.689	138.091	104.271	83.265	65.825	142.058	117.515	94.585	83.894	61.922
PRESSURE DROP IN-H2O	0.282	0.269	0.162	0.102	0.064	0.253	0.177	0.121	0.093	0.051
INLET STEAM CONDITIONS										
FLOW LBM/HR	3.33E+06	3.20E+06	2.43E+06	1.81E+06	1.22E+06	3.42E+06	3.13E+06	2.38E+06	1.77E+06	1.19E+06
MASS FLOW LBM/SQFT/HR	1.81E+05	1.74E+05	1.32E+05	9.82E+04	6.63E+04	1.86E+05	1.70E+05	1.29E+05	9.60E+04	6.47E+04
TEMPERATURE F	763.541	757.007	759.199	761.653	752.563	744.27	766.186	754.154	775.172	765.669
PRESSURE PSIA	586.7	565.19	432.48	324.91	219.47	586.7	565.19	432.48	324.91	219.47
ENTHALPY BTU/LBM	1388.633	1386.054	1393.734	1400.113	1400.287	1377.828	1391.155	1391.015	1407.215	1407.026
OUTLET STEAM CONDITIONS										
TEMPERATURE F	783.712	777.735	774.482	790.312	779.752	764.579	783.267	767.365	802.548	790.433
SATURATION TEMPERATURE. . . F	482.883	478.879	451.384	423.571	388.099	482.883	478.879	451.384	423.571	388.099
PRESSURE PSIA	581.7	560.19	428.48	320.91	215.47	581.7	560.19	428.48	320.91	215.47
ENTHALPY BTU/LBM	1400.083	1397.785	1402.139	1415.334	1414.444	1389.458	1400.836	1398.317	1421.745	1419.935
SECTION DUTIES										
STEAM DUTY BTU/HR	3.82E+07	3.76E+07	2.04E+07	2.76E+07	1.73E+07	3.98E+07	3.03E+07	1.74E+07	2.57E+07	1.54E+07

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclo Station Units 1&2

UPSTREAM CAVITY RADIATION BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DOWNSTREAM CAVITY RADIATION BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DIRECT FURNACE RADIATION BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CONVECTION TO STEAM BTU/HR	3.82E+07	3.76E+07	2.04E+07	2.76E+07	1.73E+07	3.98E+07	3.03E+07	1.74E+07	2.57E+07	1.54E+07
HEAT TO THE WALL BTU/HR	1.19E+06	1.18E+06	8.13E+05	7.81E+05	6.20E+05	1.18E+06	9.90E+05	6.99E+05	7.76E+05	5.78E+05
GAS DUTY BTU/HR	3.94E+07	3.88E+07	2.12E+07	2.84E+07	1.79E+07	4.10E+07	3.13E+07	1.81E+07	2.65E+07	1.60E+07
CONVECTIVE HEAT TRANSFER DATA										
OVERALL HTC BTU/SQFT-HR-F	14.403	14.138	10.218	12.792	8.312	14.471	13.03	9.764	12.946	7.913
HTC ADJUSTMENT FACTOR, "UAF"	0.885	0.885	0.759	1.109	0.882	0.885	0.885	0.759	1.109	0.882
SECTION LMTD	342.228	343.375	257.819	278.279	268.842	355.326	300.14	230.235	256.674	251.276
WALL SAT TEMPERATURE	684.408	676.654	673.399	665.617	665.617	684.408	676.654	673.399	665.617	665.617
WALL LMTD	431.341	434.034	351.218	388.476	369.267	425.255	398.111	317.54	379.769	363.611
WALL HTC	18.308	18.009	15.322	13.308	11.11	18.358	16.469	14.583	13.525	10.516
COMPONENTS OF FLUE GAS CONVECTIVE CONDUCTANCE										
"UCCPRI"	171.245	168.919	147.071	126.975	110.75	165.904	149.764	135.675	123.563	103.249
"FPP"	0.125	0.125	0.124	0.124	0.124	0.129	0.129	0.127	0.128	0.128
"REYNO"	33592.48	32939.581	26825.882	20878.815	16809.525	32092.44	27234.942	23743.263	19946.08	14960.261
"FA"	0.921	0.919	0.902	0.886	0.835	0.917	0.904	0.894	0.883	0.806
"FD"	0.955	0.955	0.955	0.955	0.955	0.955	0.955	0.955	0.955	0.955
"CLX"	1	1	1	1	1	1	1	1	1	1
"UCG", CONVECTIVE CONDUCTANCE	16.809	16.522	13.946	11.892	9.725	16.677	14.805	13.056	11.898	9.033
COMPONENTS OF STEAM CONVECTIVE CONDUCTANCE										
"UCLPRI"	518.308	502.134	402.27	318.194	232.338	529.551	492.588	396.313	312.477	227.767
"FT"	0.994	0.994	0.994	0.994	0.994	0.993	0.994	0.993	0.994	0.994
"FPP"	0.323	0.322	0.315	0.311	0.305	0.322	0.322	0.315	0.312	0.306
"UCS", CONVECTIVE CONDUCTANCE	146.59	141.44	110.942	86.554	62.099	149.565	138.854	109.177	85.29	61.106
COMPONENTS OF INTERTUBE RADIATION CONDUCTANCE										
"URPRI"	5.537	5.492	5.147	5.301	5.186	5.434	5.378	4.99	5.317	5.21

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclo Station Units 1&2

"K"	0.271	0.271	0.267	0.267	0.267	0.309	0.309	0.306	0.306	0.285
"FS"	1	1	1	1	1	1	1	1	1	1
"URG", ITR CONDUCTANCE.....	1.499	1.487	1.376	1.416	1.385	1.681	1.664	1.527	1.627	1.483
11. ECONOMIZER STRINGER TUBES										
INLET FLUE GAS CONDITIONS										
FLOW FROM UPSTREAM SECTION LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
AIR INLEAKAGE FLOW LBM/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SECTION INLET FLOW LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
MASS FLOW LBM/SQFT-HR	4.11E+03	4.02E+03	3.20E+03	2.52E+03	2.01E+03	3.90E+03	3.30E+03	2.81E+03	2.41E+03	1.79E+03
TEMPERATURE F	1103.543	1098.384	1016.039	1039.633	1023.389	1096.885	1063.18	982.927	1031.865	1018.243
ENTHALPY BTU/LBM	404.575	403.065	378.712	385.507	380.806	418.016	407.703	382.628	397.411	393.23
VELOCITY FT/SEC	44.689	43.554	32.887	26.262	20.761	44.805	37.064	29.832	26.46	19.53
OUTLET FLUE GAS CONDITIONS										
TEMPERATURE F	1054.667	1048.923	987.627	956.512	994.613	1045.034	1009.242	953.146	944.752	987.909
ENTHALPY BTU/LBM	390.312	388.64	370.52	361.562	372.503	402.17	391.296	373.682	371.168	384.075
VELOCITY FT/SEC	43.292	42.171	32.254	24.806	20.358	43.312	35.751	29.216	24.915	19.129
PRESSURE DROP IN-H2O	0.01	0.009	0.006	0.003	0.002	0.009	0.006	0.004	0.003	0.002
INLET STEAM CONDITIONS										
FLOW LBM/HR	3.75E+06	3.51E+06	2.55E+06	1.86E+06	1.27E+06	3.73E+06	3.50E+06	2.50E+06	1.75E+06	1.23E+06
MASS FLOW LBM/SQFT/HR	1.34E+06	1.26E+06	9.16E+05	6.68E+05	4.55E+05	1.34E+06	1.26E+06	8.95E+05	6.29E+05	4.40E+05
TEMPERATURE F	522.773	514.507	489.996	449.927	441.655	520.761	509.165	487.232	453.869	442.119
PRESSURE PSIA	2779.7	2682.9	2616.11	2496.57	2497.7	2779.7	2682.9	2616.11	2496.57	2497.7
ENTHALPY BTU/LBM	513.851	504.233	476.127	431.511	422.492	511.494	498.042	473.003	435.83	422.996
OUTLET STEAM CONDITIONS										
TEMPERATURE F	541.661	534.647	503.986	491.122	462.556	541.647	529.056	502.008	500.742	463.924
SATURATION TEMPERATURE F	682.004	676.654	672.862	667.051	667.118	682.004	676.654	672.862	667.051	667.118
PRESSURE PSIA	2745.21	2648.41	2581.62	2482.08	2483.21	2745.21	2648.41	2581.62	2482.08	2483.21

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units1&2

ENTHALPY BTU/LBM	536 331	527 991	492 084	477.378	445 388	536 315	521 331	489 812	488 361	446 902
SECTION DUTIES										
STEAM DUTY BTU/HR	8.43E+07	8 34E+07	4.08E+07	8 55E+07	2 91E+07	9 26E+07	8 16E+07	4 20E+07	9 22E+07	2 94E+07
UPSTREAM CAVITY RADIATION BTU/HR	0.00E+00	0 00E+00	0 00E+00	0.00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00
DOWNSTREAM CAVITY RADIATION BTU/HR	1 06E+07	1 05E+07	8 78E+06	8 16E+06	9 30E+06	1 48E+07	1 34E+07	1 13E+07	1 11E+07	9 95E+06
DIRECT FURNACE RADIATION BTU/HR	0.00E+00	0.00E+00	0.00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0.00E+00	0.00E+00
CONVECTION TO STEAM BTU/HR	7 37E+07	7 29E+07	3 20E+07	7 73E+07	1 98E+07	7 78E+07	6 82E+07	3 07E+07	8 11E+07	1 94E+07
HEAT TO THE WALL . . . BTU/HR	3 91E+06	3 87E+06	2 77E+06	2 49E+06	2 37E+06	4 09E+06	3 48E+06	2 54E+06	2 61E+06	2 32E+06
GAS DUTY BTU/HR	7 77E+07	7 68E+07	3 48E+07	7 98E+07	2 21E+07	8 19E+07	7 17E+07	3 32E+07	8 37E+07	2 17E+07
CONVECTIVE HEAT TRANSFER DATA										
OVERALL HTC BTU/SQFT-HR-F	10 072	9 919	4 728	10 953	2 649	10 767	9 85	4 843	11 851	2 638
HTC ADJUSTMENT FACTOR, "UAF" . . .	0 905	0 905	0 499	1 295	0 342	0 905	0 905	0 499	1 295	0 342
SECTION LMTD.	546.752	548.936	504 8	527.261	556 883	539.607	516 91	473 375	510.736	550 048
WALL SAT TEMPERATURE.	684.408	676.654	673.399	665 617	665 617	684 408	676 654	673 399	665 617	665 617
WALL LMTD	394.194	396 486	328 226	330 716	343 183	385 971	358 879	294 386	320 722	337 234
WALL HTC.	11.13	10 96	9 476	8 458	7 744	11 897	10 884	9 705	9 151	7 712
COMPONENTS OF FLUE GAS CONVECTIVE CONDUCTANCE										
"UCCPRJ"	88 261	87 062	75 801	65 444	57 081	85 508	77 19	69 928	63 685	53 215
"FPP"	0 12	0 12	0 118	0 118	0 118	0 124	0 123	0 121	0 121	0 121
"REYNO"	10241.104	10048 998	8225 74	6519 49	5220 875	9746 412	8345 292	7279 192	6239 868	4660 32
"FA"	0 977	0 977	0 971	0 965	0 961	0 976	0 971	0 968	0 964	0 959
"FD"	0 91	0 91	0 91	0 91	0 91	0 91	0 91	0 91	0 91	0 91
"CLX"	1	1	1	1	1	1	1	1	1	1
"UCG", CONVECTIVE CONDUCTANCE. . .	7.56	7 438	6 335	5 411	4 693	7 514	6 698	5 945	5 398	4 478
COMPONENTS OF INTERTUBE RADIATION CONDUCTANCE										
"URPRI"	4 324	4 267	3 861	3 75	3 756	4 287	4 095	3 732	3 726	3 735
"K"	0 825	0 825	0 813	0 812	0 812	1 022	1 022	1 008	1 008	0 866
"FS"	1	1	1	1	1	1	1	1	1	1

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

"URG", ITR CONDUCTANCE	3.569	3.523	3.141	3.047	3.051	4.383	4.187	3.76	3.754	3.234
12. REAR CAVITY										
INLET FLUE GAS CONDITIONS										
FLOW FROM UPSTREAM SECTION LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
AIR INLEAKAGE FLOW LBM/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SECTION INLET FLOW LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
TEMPERATURE F	1054.672	1048.923	987.622	956.512	994.613	1045.034	1009.237	953.146	944.752	987.914
ENTHALPY BTU/LBM	390.312	388.64	370.52	361.562	372.503	402.17	391.296	373.682	371.168	384.075
OUTLET FLUE GAS CONDITIONS										
TEMPERATURE F	1039.822	1033.844	972.22	938.556	968.69	1024.194	987.533	932.2	920.698	958.606
ENTHALPY BTU/LBM	385.997	384.262	366.095	356.427	365.054	395.833	384.731	367.415	363.981	375.267
SECTION DUTIES										
RAD TO UPSTREAM SECTION BTU/HR	1.06E+07	1.05E+07	8.78E+06	8.16E+06	9.30E+06	1.48E+07	1.34E+07	1.13E+07	1.11E+07	9.95E+06
RAD TO DOWNSTREAM SECTION BTU/HR	4.33E+06	4.30E+06	3.39E+06	3.15E+06	3.78E+06	6.17E+06	4.89E+06	3.99E+06	3.96E+06	3.80E+06
RAD TO THE WALL BTU/HR	8.57E+06	8.52E+06	6.60E+06	5.82E+06	6.77E+06	1.18E+07	1.04E+07	8.03E+06	7.83E+06	7.18E+06
GAS DUTY BTU/HR	2.35E+07	2.33E+07	1.88E+07	1.71E+07	1.98E+07	3.28E+07	2.87E+07	2.33E+07	2.29E+07	2.09E+07
13. PRIMARY REHEATER										
INLET FLUE GAS CONDITIONS										
FLOW FROM UPSTREAM SECTION LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
AIR INLEAKAGE FLOW LBM/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SECTION INLET FLOW LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
MASS FLOW LBM/SQFT-HR	8.59E+03	8.40E+03	6.69E+03	5.26E+03	4.20E+03	8.16E+03	6.90E+03	5.86E+03	5.03E+03	3.75E+03
TEMPERATURE F	1039.822	1033.844	972.225	938.561	968.695	1024.194	987.533	932.205	920.703	958.606
ENTHALPY BTU/LBM	385.997	384.262	366.095	356.427	365.054	395.833	384.731	367.415	363.981	375.267
VELOCITY FT/SEC	89.625	87.289	66.717	51.205	41.806	89.302	73.643	60.179	51.199	39.185
OUTLET FLUE GAS CONDITIONS										

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

TEMPERATURE F	840.85	832.795	760.275	680.718	739.991	822.916	818.933	751.483	697.552	748.505
ENTHALPY BTU/LBM	329.047	326.776	306.183	284.16	300.525	335.6	334.424	314.117	298.487	313.213
VELOCITY FT/SEC	77.733	75.539	56.842	41.763	35.112	77.189	65.064	52.366	42.922	33.38
PRESSURE DROP IN-H2O	1.528	1.454	0.88	0.521	0.344	1.361	0.959	0.663	0.476	0.273
INLET STEAM CONDITIONS:										
FLOW LBM/HR	3.33E+06	3.20E+06	2.43E+06	1.81E+06	1.22E+06	3.42E+06	3.13E+06	2.38E+06	1.77E+06	1.19E+06
MASS FLOW LBM/SQFT/HR	1.85E+05	1.78E+05	1.35E+05	1.01E+05	6.80E+04	1.90E+05	1.74E+05	1.32E+05	9.84E+04	6.63E+04
TEMPERATURE F	607.998	597.236	574.661	519.594	486.307	593.732	644.861	605.182	556.381	528.491
PRESSURE PSIA	594.7	573.19	437.48	329.91	224.47	594.7	573.19	437.48	329.91	224.47
ENTHALPY BTU/LBM	1296.028	1290.95	1289.073	1266.191	1258.538	1286.675	1320.818	1307.451	1288.105	1282.299
OUTLET STEAM CONDITIONS:										
TEMPERATURE F	763.541	757.007	759.199	761.653	752.563	744.27	766.186	754.154	775.172	765.669
SATURATION TEMPERATURE F	483.798	479.82	452.309	424.726	389.669	483.798	479.82	452.309	424.726	389.669
PRESSURE PSIA	586.7	565.19	432.48	324.91	219.47	586.7	565.19	432.48	324.91	219.47
ENTHALPY BTU/LBM	1388.633	1386.054	1393.734	1400.113	1400.287	1377.828	1391.155	1391.015	1407.215	1407.026
SECTION DUTIES:										
STEAM DUTY BTU/HR	3.09E+08	3.05E+08	2.54E+08	2.43E+08	1.73E+08	3.12E+08	2.20E+08	1.99E+08	2.11E+08	1.49E+08
UPSTREAM CAVITY RADIATION BTU/HR	4.33E+06	4.30E+06	3.39E+06	3.15E+06	3.78E+06	6.17E+06	4.89E+06	3.99E+06	3.96E+06	3.80E+06
DOWNSTREAM CAVITY RADIATION BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DIRECT FURNACE RADIATION BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CONVECTION TO STEAM BTU/HR	3.04E+08	3.00E+08	2.51E+08	2.39E+08	1.70E+08	3.06E+08	2.15E+08	1.95E+08	2.07E+08	1.45E+08
HEAT TO THE WALL BTU/HR	5.71E+06	5.63E+06	3.41E+06	1.50E+06	2.43E+06	5.39E+06	4.75E+06	2.93E+06	1.89E+06	2.45E+06
GAS DUTY BTU/HR	3.10E+08	3.06E+08	2.54E+08	2.41E+08	1.72E+08	3.11E+08	2.20E+08	1.98E+08	2.09E+08	1.47E+08
CONVECTIVE HEAT TRANSFER DATA										
OVERALL HTC BTU/SQFT-HR-F	13.829	13.569	14.547	16.383	8.348	13.922	12.616	13.931	16.66	8.114
HTC ADJUSTMENT FACTOR, "UAF"	0.874	0.874	1.112	1.512	0.91	0.874	0.874	1.112	1.512	0.91
SECTION LMTD	253.948	255.465	198.909	168.656	234.3	253.59	196.749	161.657	143.342	206.182
WALL SAT TEMPERATURE	684.408	676.654	673.399	665.617	665.617	684.408	676.654	673.399	665.617	665.617

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Ancote Station Units 1&2

WALL LMTD	242.472	242.957	171.571	89.08	162.788	224.296	215.708	150.816	107.398	166.401
WALL HTC	9.011	8.862	7.607	6.434	5.715	9.188	8.424	7.439	6.724	5.639
COMPONENTS OF FLUE GAS CONVECTIVE CONDUCTANCE										
"UCCPRI"	132.834	131.03	114.082	98.494	85.908	128.691	116.172	105.243	95.847	80.09
"FPP"	0.121	0.12	0.119	0.117	0.118	0.123	0.124	0.122	0.121	0.121
"REYNO"	23700.758	23270.356	18931.697	15220.77	12087.39	22703.258	19114.896	16641.218	14457.522	10695.026
"FA"	1.005	1.004	0.986	0.957	0.933	1.002	0.987	0.968	0.952	0.923
"FD"	1	1	1	1	1	1	1	1	1	1
"CLX"	1	1	1	1	1	1	1	1	1	1
"UCG", CONVECTIVE CONDUCTANCE	16.107	15.83	13.371	11.065	9.444	15.926	14.201	12.423	11.031	8.977
COMPONENTS OF STEAM CONVECTIVE CONDUCTANCE										
"UCLPRI"	529.937	513.399	411.295	325.333	237.55	541.432	503.639	405.204	319.488	232.877
"FT"	0.993	0.993	0.993	0.993	0.993	0.993	0.993	0.993	0.993	0.993
"FPP"	0.324	0.323	0.312	0.304	0.295	0.326	0.322	0.312	0.304	0.296
"UCS", CONVECTIVE CONDUCTANCE	148.583	143.413	111.105	85.44	60.484	152.409	140.151	109.433	84.068	59.596
COMPONENTS OF INTERTUBE RADIATION CONDUCTANCE										
"URPRI"	4.491	4.429	4.135	3.818	3.895	4.358	4.427	4.092	3.915	4.006
"K"	0.357	0.357	0.352	0.352	0.352	0.427	0.427	0.421	0.421	0.377
"FS"	1	1	1	1	1	1	1	1	1	1
"URG", ITR CONDUCTANCE	1.601	1.58	1.456	1.344	1.371	1.862	1.892	1.724	1.65	1.509
14. ECONOMIZER										
INLET FLUE GAS CONDITIONS										
FLOW FROM UPSTREAM SECTION .. LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
AIR INLEAKAGE FLOW .. LBM/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SECTION INLET FLOW. LBM/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
MASS FLOW .. LBM/SQFT-HR	4.28E+04	4.19E+04	3.34E+04	2.62E+04	2.10E+04	4.07E+04	3.44E+04	2.92E+04	2.51E+04	1.87E+04
TEMPERATUREF	840.85	832.795	760.28	680.718	739.986	822.921	818.933	751.483	697.557	748.51

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

ENTHALPY BTU/LBM	329 047	326 776	306 183	284 16	300 525	335 6	334 424	314 117	298 487	313 213
VELOCITY FT/SEC	387 561	376 621	283 403	208 222	175 062	384 85	324 396	261 085	214 004	166 429
OUTLET FLUE GAS CONDITIONS										
TEMPERATURE F	727 916	718 713	654 22	611 289	631 407	715 791	703 519	645 592	624 188	635 092
ENTHALPY BTU/LBM	297 459	294 907	276 908	265 174	270 655	304 258	300 701	283 544	277 422	280 504
VELOCITY FT/SEC	353 906	343 378	258 764	195 545	159 217	352 706	295 114	238 258	200 436	150 806
PRESSURE DROP IN-H ₂ O	106 723	101 349	60 858	35 661	23 578	95 051	67 516	46 376	33 043	18 832
INLET STEAM CONDITIONS:										
FLOW LBM/HR	3 75E+06	3 51E+06	2 55E+06	1 86E+06	1 27E+06	3 73E+06	3 50E+06	2 50E+06	1 75E+06	1 23E+06
MASS FLOW LBM/SQFT/HR	1 28E+06	1 19E+06	8 68E+05	6 34E+05	4 31E+05	1 27E+06	1 19E+06	8 49E+05	5 96E+05	4 18E+05
TEMPERATURE F	483	472 2	446 15	418 52	382 85	483	472 2	446 15	418 52	382 85
PRESSURE PSIA	2814 7	2717 9	2651 11	2511 57	2512 7	2814 7	2717 9	2651 11	2511 57	2512 7
ENTHALPY BTU/LBM	468 303	456 207	427 514	397 556	359 77	468 303	456 207	427 514	397 556	359 77
OUTLET STEAM CONDITIONS:										
TEMPERATURE F	522 773	514 507	489 996	449 927	441 655	520 761	509 165	487 232	453 869	442 119
SATURATION TEMPERATURE . . . F	683 871	678 58	674 831	667 909	667 976	683 871	678 58	674 831	667 909	667 976
PRESSURE PSIA	2779 7	2682 9	2616 11	2496 57	2497 7	2779 7	2682 9	2616 11	2496 57	2497 7
ENTHALPY BTU/LBM	513 851	504 233	476 127	431 511	422 492	511 494	498 042	473 003	435 83	422 996
SECTION DUTIES										
STEAM DUTY BTU/HR	1 71E+08	1 69E+08	1 24E+08	6 33E+07	7 96E+07	1 61E+08	1 47E+08	1 14E+08	6 72E+07	7 77E+07
UPSTREAM CAVITY RADIATION BTU/HR	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00
DOWNSTREAM CAVITY RADIATION BTU/HR	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00
DIRECT FURNACE RADIATION BTU/HR	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00	0 00E+00
CONVECTION TO STEAM BTU/HR	1 71E+08	1 69E+08	1 24E+08	6 33E+07	7 96E+07	1 61E+08	1 47E+08	1 14E+08	6 72E+07	7 77E+07
HEAT TO THE WALL BTU/HR	1 08E+06	1 05E+06	0 00E+00	0 00E+00	0 00E+00	8 81E+05	7 63E+05	0 00E+00	0 00E+00	0 00E+00
GAS DUTY BTU/HR	1 72E+08	1 70E+08	1 24E+08	6 33E+07	7 96E+07	1 62E+08	1 47E+08	1 14E+08	6 72E+07	7 77E+07
CONVECTIVE HEAT TRANSFER DATA										
OVERALL HTC BTU/SQFT-HR-F	29 933	29 432	25 603	14 694	14 311	29 699	26 761	24 191	14 694	13 681

BOILER PERFORMANCE ANALYSIS -- Progress Energy Service Company, LLC for Anclote Station Units 1&2

HTC ADJUSTMENT FACTOR, "UAF"	0.752	0.752	0.763	0.515	0.571	0.752	0.752	0.763	0.515	0.571
SECTION LMTD	279.905	280.871	237.824	211.21	272.687	265.969	268.638	230.332	224.144	278.44
WALL SAT TEMPERATURE	684.408	676.654	673.399	665.617	665.617	684.408	676.654	673.399	665.617	665.617
WALL LMTD	88.248	86.969	0	0	0	72.152	69.236	0	0	0
WALL HTC	18.731	18.415	15.801	13.456	11.874	18.638	16.828	14.995	13.511	11.391
COMPONENTS OF FLUE GAS CONVECTIVE CONDUCTANCE										
"UCCPRI"	406.762	401.237	349.34	301.607	263.066	394.074	355.738	322.273	293.501	245.249
"FPP"	0.114	0.114	0.112	0.11	0.111	0.117	0.116	0.114	0.113	0.113
"REYNO"	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000
"FA"	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
"FD"	1	1	1	1	1	1	1	1	1	1
"CLX"	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
"UCG", CONVECTIVE CONDUCTANCE	39.026	38.377	32.879	27.917	24.426	38.622	34.737	30.944	27.818	23.275
COMPONENTS OF INTERTUBE RADIATION CONDUCTANCE										
"URPRI"	3.134	3.061	2.752	2.504	2.597	3.078	2.998	2.72	2.555	2.616
"K"	0.249	0.249	0.246	0.246	0.246	0.283	0.283	0.28	0.28	0.262
"FS"	1	1	1	1	1	1	1	1	1	1
"URG", ITR CONDUCTANCE	0.779	0.761	0.676	0.615	0.638	0.872	0.849	0.761	0.715	0.685
15. FLUE GAS RECIRCULATION CONNECTION										
FLUE GAS INLET STREAM CONDITIONS										
FLOW, LB/HR	5.44E+06	5.32E+06	4.24E+06	3.33E+06	2.66E+06	5.17E+06	4.37E+06	3.72E+06	3.19E+06	2.38E+06
TEMPERATURE, F	727.916	718.713	654.22	611.289	631.407	715.791	703.519	645.592	624.188	635.092
ENTHALPY, BTU/LB	297.459	294.907	276.908	265.174	270.655	304.258	300.701	283.544	277.422	280.504
FLUE GAS RECIRCULATION STREAM CONDITIONS										
FLOW, LB/HR	1.26E+06	1.23E+06	9.33E+05	8.08E+05	9.20E+05	8.97E+05	4.33E+05	5.35E+05	7.36E+05	6.79E+05
TEMPERATURE, F	727.916	718.713	654.22	611.289	631.407	715.791	703.519	645.592	624.188	635.092
ENTHALPY, BTU/LB	297.459	294.907	276.908	265.174	270.655	304.258	300.701	283.544	277.422	280.504

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

FLUE GAS MAIN STREAM CONDITIONS										
FLOW LB/HR	4.19E+06	4.09E+06	3.31E+06	2.53E+06	1.74E+06	4.27E+06	3.94E+06	3.18E+06	2.45E+06	1.70E+06
TEMPERATURE F	727.916	718.713	654.22	611.289	631.407	715.791	703.519	645.592	624.188	635.092
ENTHALPY BTU/LB	297.459	294.907	276.908	265.174	270.655	304.258	300.701	283.544	277.422	280.504
RADIANT HEAT TRANSFER										
TO/FROM UPSTREAM SECTION BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TO/FROM MAIN GAS STREAM BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TO/FROM BYPASS GAS STREAM BTU/HR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
21. BISECTOR HEATER										
INLET FLUE GAS CONDITIONS										
FLOW LBM/HR	4.19E+06	4.09E+06	3.31E+06	2.53E+06	1.74E+06	4.27E+06	3.94E+06	3.18E+06	2.45E+06	1.70E+06
TEMPERATURE F	727.92	718.71	654.22	611.29	631.41	715.79	703.52	645.59	624.19	635.09
ENTHALPY BTU/LBM	297.46	294.91	276.91	265.17	270.65	304.26	300.7	283.54	277.42	280.5
OUTLET FLUE GAS CONDITIONS(UNCORRECTED)										
FLOW LBM/HR	4.19E+06	4.09E+06	3.31E+06	2.53E+06	1.74E+06	4.27E+06	3.94E+06	3.18E+06	2.45E+06	1.70E+06
TEMPERATURE F	363.74	360.78	327.76	291.91	292.75	367.95	360.51	322.17	294.37	300.6
ENTHALPY BTU/LBM	199.21	198.43	189.68	180.35	180.57	205.81	203.75	192.97	185.37	187.05
HEAT CAPACITY FLUE GAS BTU/LB-F	0.2698	0.2695	0.2672	0.2656	0.266	0.283	0.2826	0.28	0.2791	0.2794
OUTLET FLUE GAS CONDITIONS(CORRECTED)										
FLOW LBM/HR	4.46E+06	4.36E+06	3.52E+06	2.74E+06	1.89E+06	4.55E+06	4.19E+06	3.39E+06	2.66E+06	1.84E+06
TEMPERATURE F	349.13	346.48	315.29	278.58	279.47	353.95	346.9	309.87	280.53	287.39
LEAKAGE %	6.431	6.431	6.431	8.367	8.367	6.431	6.431	6.431	8.367	8.367
HEAT CAPACITY OF LKG AIR BTU/LB-F	0.246	0.246	0.2457	0.2455	0.2455	0.2461	0.246	0.2456	0.2454	0.2455
HEAT CAPACITY OF FLUE GAS BTU/LB-F	0.2622	0.2621	0.2606	0.2592	0.2592	0.276	0.2757	0.2738	0.2728	0.273
INLET COMBUSTION AIR CONDITIONS										
FLOW LBM/HR	3.91E+06	3.82E+06	3.09E+06	2.36E+06	1.63E+06	4.04E+06	3.72E+06	3.01E+06	2.32E+06	1.61E+06

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

TEMPERATURE F	107	109.7	109.7	110.41	111.9	109.69	109.69	96.65	96.65	111.9
ENTHALPY BTU/LBM	130.92	131.58	131.58	131.75	132.11	131.57	131.57	128.39	128.39	132.11
OUTLET COMBUSTION AIR CONDITIONS										
TEMPERATURE F	531.85	526.94	486.99	477.41	501.24	529.76	523.48	483.56	489.78	510.37
ENTHALPY BTU/LBM	236.26	235.02	224.94	222.53	228.53	235.73	234.14	224.08	225.64	230.83
HEAT CAPACITY OF COMB AIR BTU/LB-F	0.248	0.2479	0.2475	0.2474	0.2476	0.248	0.2479	0.2473	0.2474	0.2477
MISCELLANEOUS										
GAS DUTY BTU/HR	4.11E+08	3.95E+08	2.89E+08	2.14E+08	1.57E+08	4.21E+08	3.82E+08	2.88E+08	2.26E+08	1.59E+08
EFFECTIVENESS	0.587	0.588	0.6	0.638	0.652	0.574	0.578	0.589	0.625	0.639
17. SUPERHEATER SPRAY										
INLET STEAM CONDITIONS										
FLOW LB/HR	3748092	3507207	2551933	1862232	1267664	3726463	3501109	2495352	1752911	1227467
TEMPERATURE F	751.57	760.066	787.547	814.752	823.365	771.901	770.792	805.302	860.728	849.385
PRESSURE PSIA	2694.7	2514.8	2497.85	2421.68	2416.33	2694.7	2514.8	2497.85	2421.68	2416.33
ENTHALPY BTU/LBM	1233.785	1261.055	1291.512	1321.962	1329.774	1259.232	1272.929	1308.54	1360.207	1351.423
OUTLET STEAM CONDITIONS										
FLOW LB/HR	3748092	3507207	2674714	1987249	1338422	3748092	3507207	2674714	1987249	1338422
TEMPERATURE F	751.57	760.066	746.62	750.777	766.385	767.318	769.252	742.789	732.87	756.518
PRESSURE PSIA	2694.7	2514.8	2497.85	2421.68	2416.33	2694.7	2514.8	2497.85	2421.68	2416.33
ENTHALPY BTU/LBM	1233.785	1261.055	1246.72	1258.662	1276.165	1253.787	1271.265	1241.965	1237.043	1265.566
SPRAY CONDITIONS										
FLOW LB/HR	0	0	122781	125017	70758	21629	6098	179362	234338	110955
TEMPERATURE F	340	340	340	340	340	340	340	340	340	340
PRESSURE PSIA	2814.7	2814.7	2814.7	2814.7	2814.7	2814.7	2814.7	2814.7	2814.7	2814.7
ENTHALPY BTU/LBM	315.744	315.744	315.744	315.744	315.744	315.744	315.744	315.744	315.744	315.744
18. REHEATER SPRAY										

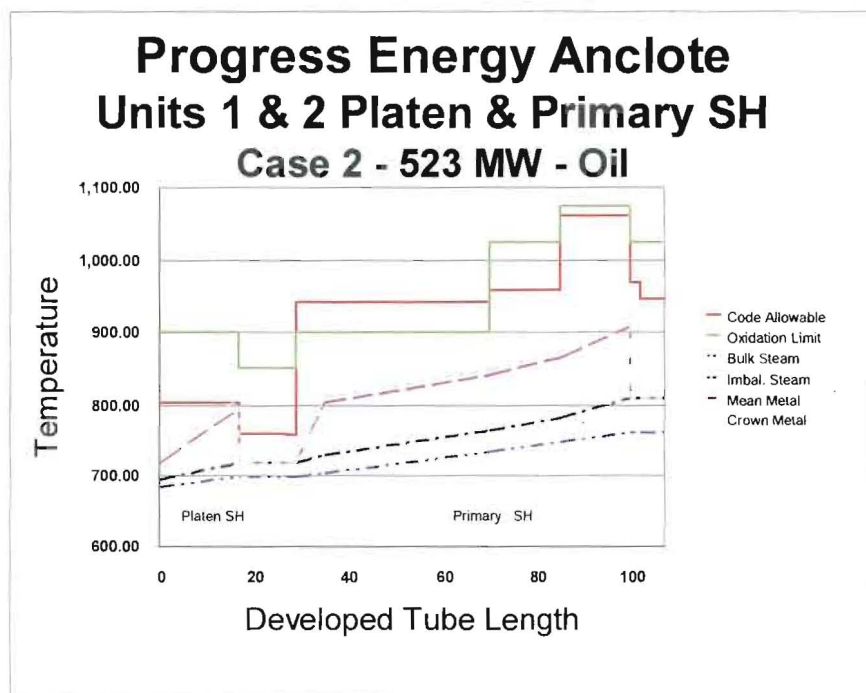
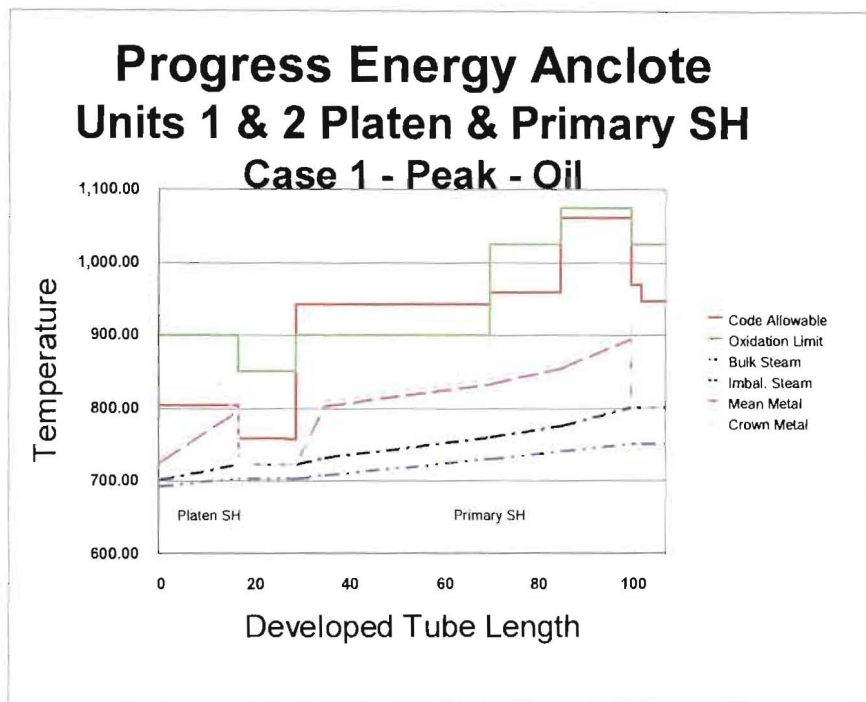
BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Ancote Station Units 1&2

INLET STEAM CONDITIONS:										
FLOW LB/HR	3333056	3124921	2383170	1770639	1192534	3333056	3124921	2383170	1770639	1192534
TEMPERATURE F	608	636.3	605.18	556.38	528.49	635	646.3	605.18	556.38	528.49
PRESSURE PSIA	594.7	573.19	437.48	329.91	224.47	594.7	573.19	437.48	329.91	224.47
ENTHALPY BTU/LBM	1296.028	1315.593	1307.451	1288.105	1282.299	1313.144	1321.691	1307.451	1288.105	1282.299
OUTLET STEAM CONDITIONS:										
FLOW LB/HR	3333056	3203886	2428168	1811464	1222589	3423920	3127635	2383170	1770639	1192534
TEMPERATURE F	607.998	597.236	574.661	519.594	486.307	593.732	644.861	605.182	556.381	528.491
PRESSURE PSIA	594.7	573.19	437.48	329.91	224.47	594.7	573.19	437.48	329.91	224.47
ENTHALPY BTU/LBM	1296.028	1290.95	1289.073	1266.191	1258.538	1286.675	1320.818	1307.451	1288.105	1282.299
SPRAY CONDITIONS:										
FLOW LB/HR	0	78965	44998	40825	30055	90864	2714	0	0	0
TEMPERATURE F	340	340	340	340	340	340	340	340	340	340
PRESSURE PSIA	2814.7	2814.7	2814.7	2814.7	2814.7	2814.7	2814.7	2814.7	2814.7	2814.7
ENTHALPY BTU/LBM	315.744	315.744	315.744	315.744	315.744	315.744	315.744	315.744	315.744	315.744

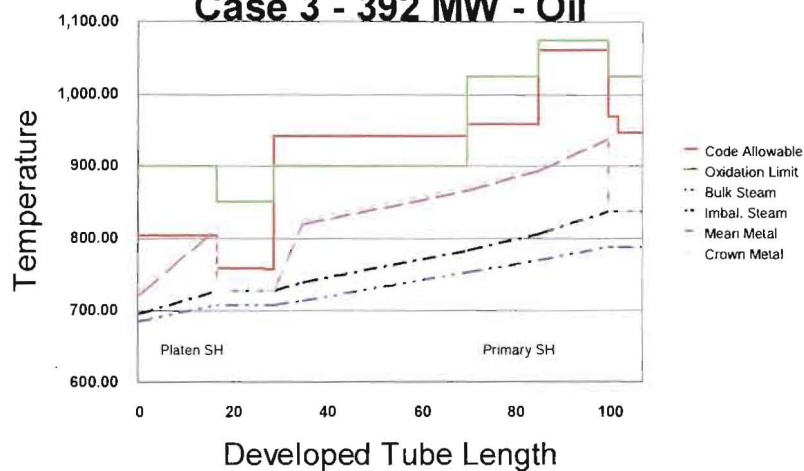
APPENDIX 4

Temperature Variable	Definition
Code Allowable	The temperature limit of a tube based on the maximum allowable stress presented in the ASME Boiler Code Section II Table 1A. The allowable stress is calculated based on tube OD and the minimum wall thickness.
Oxidation Limit	This is an industry guideline and recommendation for the maximum service temperature a material should be used to minimize high temperature oxidation & graphitization.
Bulk Steam	Average steam temperature, normally interpreted at the outlet of a respective section.
Imbalance Steam	The highest steam temperature steam exiting any tube in a respective section. This parameter directly affects the mean metal and crown metal temperature as the greater the imbalance temperature specified, the higher the respective temperatures will be.
Mean Metal	The calculated tube metal temperature at the calculated diameter of the tube that is the mid-point between the ID and OD. This temperature is used to compare against the Code allowable temperature.
Crown Metal	The calculated temperature at the tube OD, which is used to compare against the Oxidation limit.
Alarm Temperature	If present, this is the stated temperature level at which the client has placed a setpoint limit that, if reached, will notify the operator that some action is required.

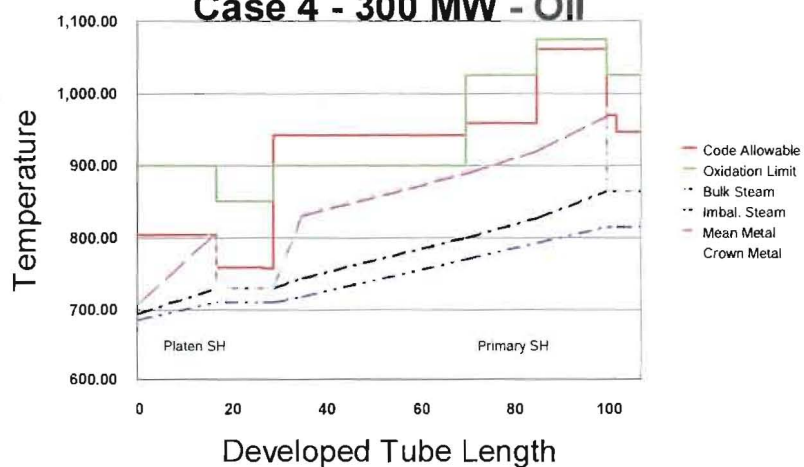
PLATEN & PRIMARY SUPERHEATERS

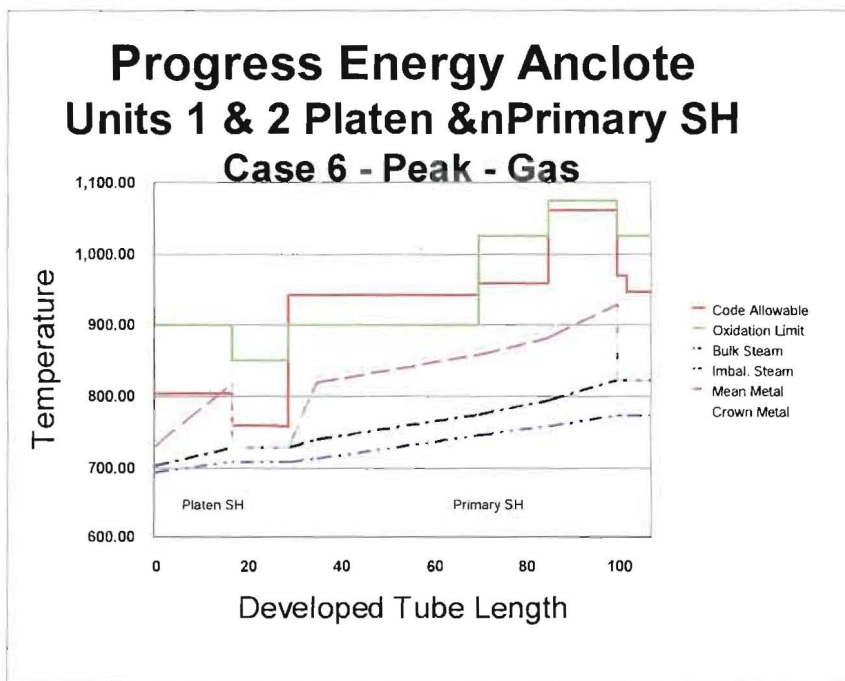
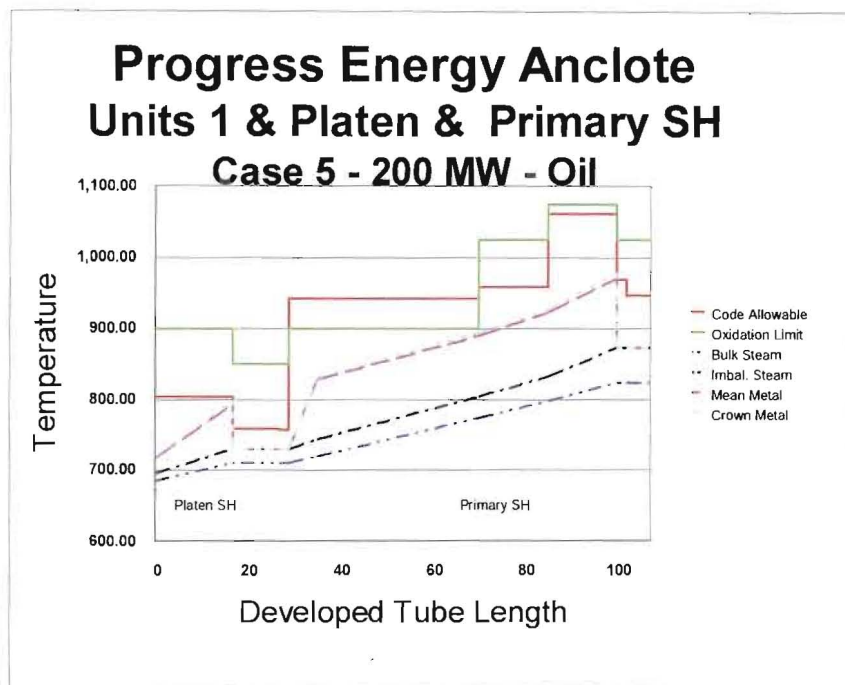


Progress Energy Anclore Units 1 & 2 Platen & Primary SH Case 3 - 392 MW - Oil

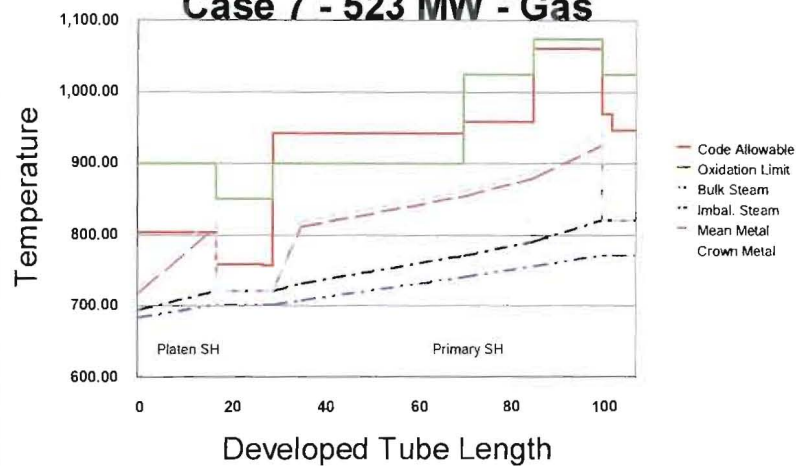


Progress Energy Anclore Units 1 & 2 Platen & Primary SH Case 4 - 300 MW - Oil

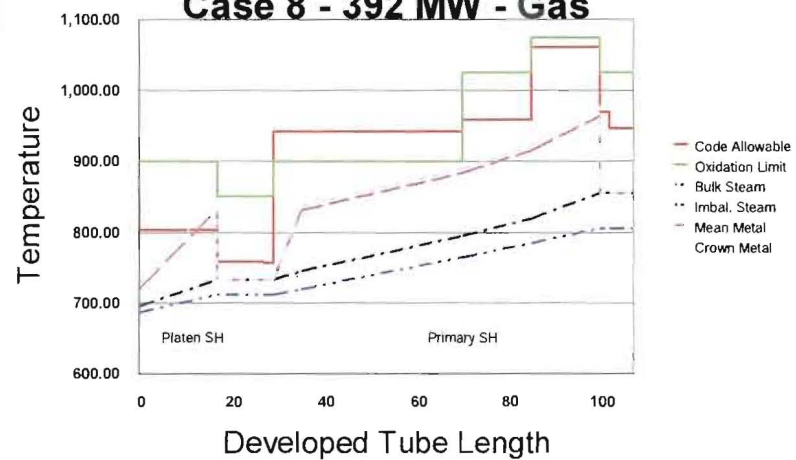




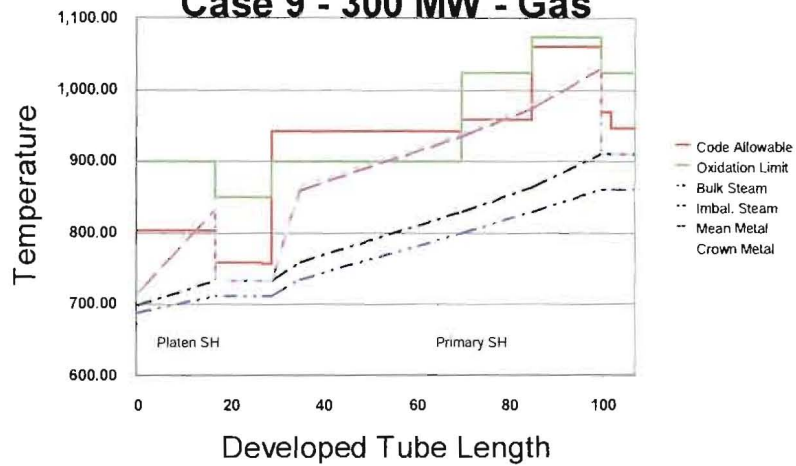
Progress Energy Anclore Units 1 & 2 Platen & Primary SH Case 7 - 523 MW - Gas



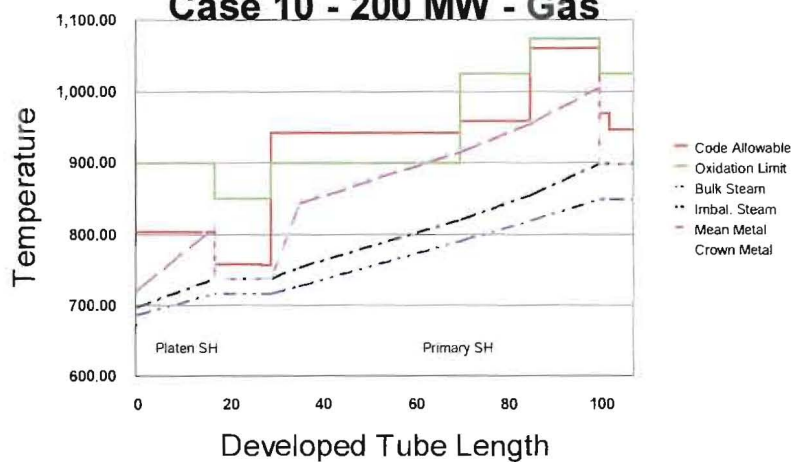
Progress Energy Anclore Units 1 & 2 Platen & Primary SH Case 8 - 392 MW - Gas



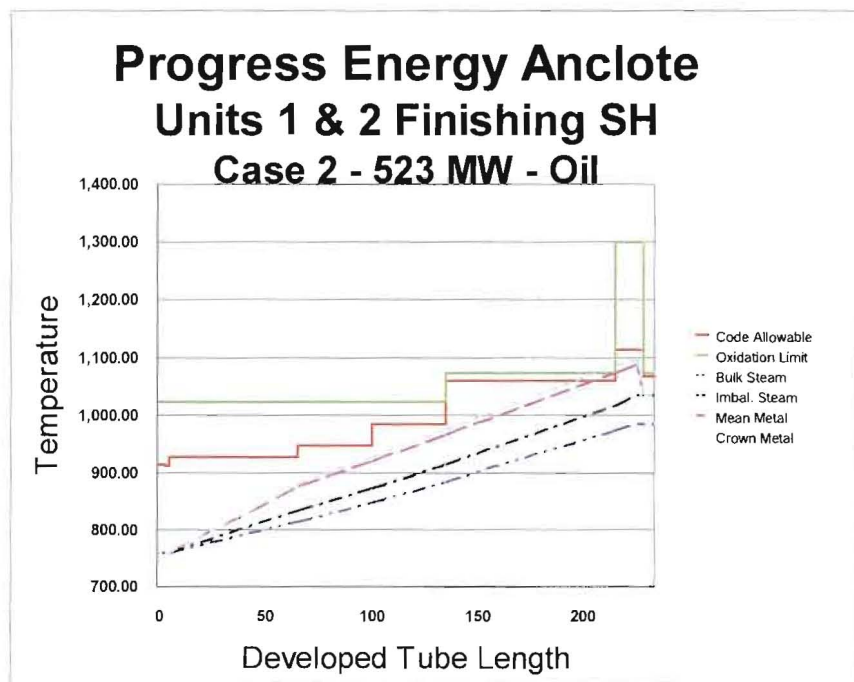
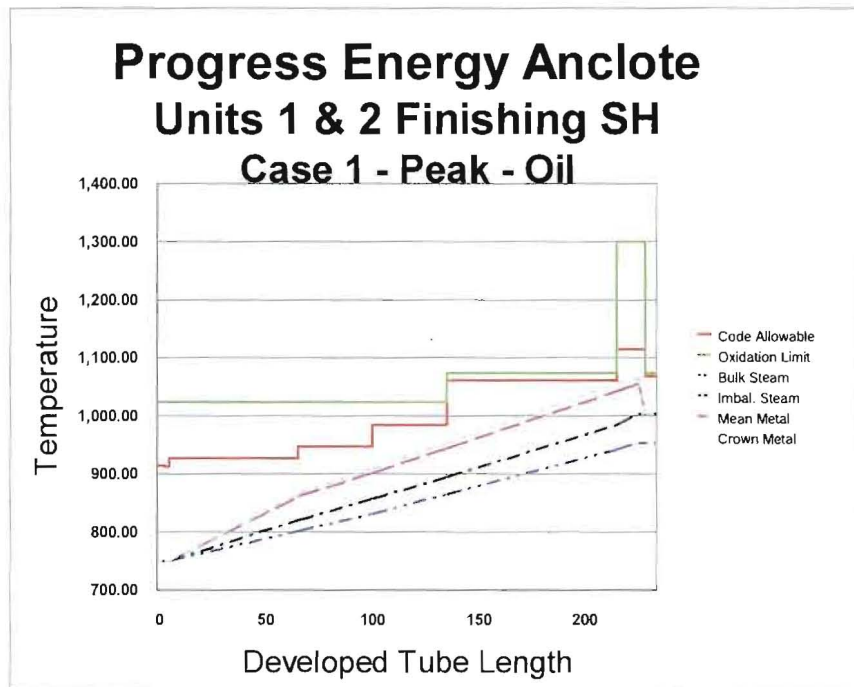
Progress Energy Anclore Units 1 & 2 Platen & Primary SH Case 9 - 300 MW - Gas

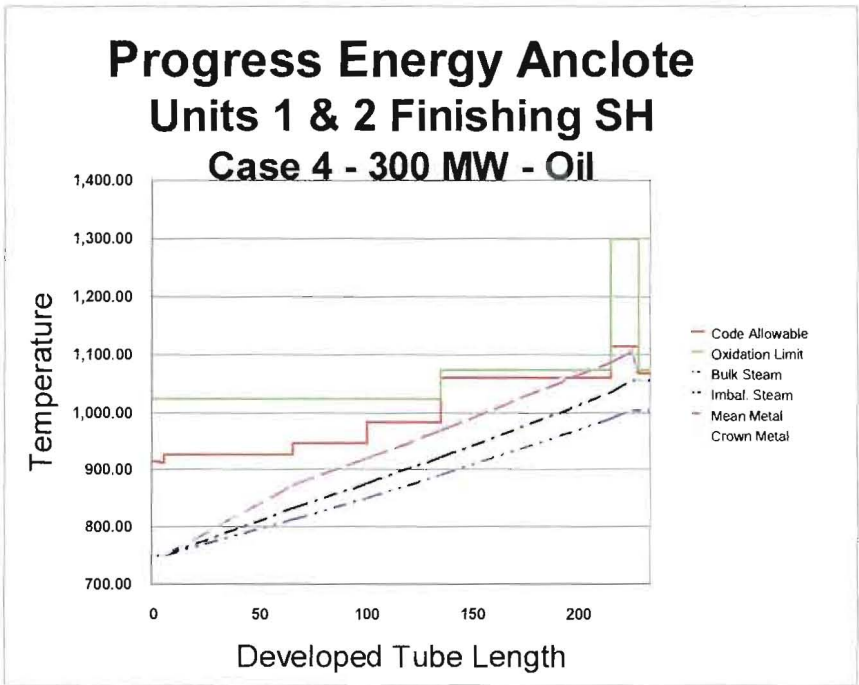
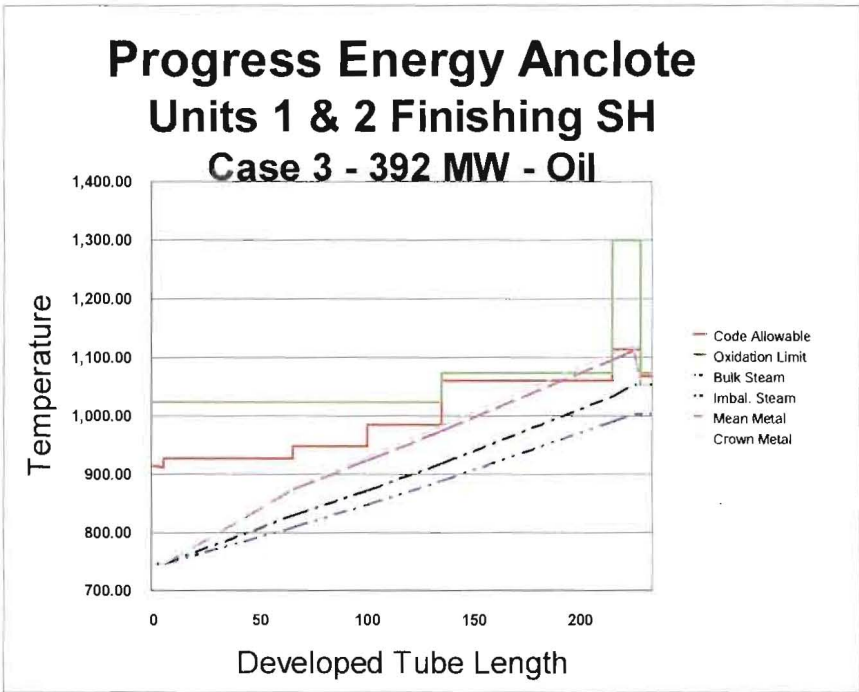


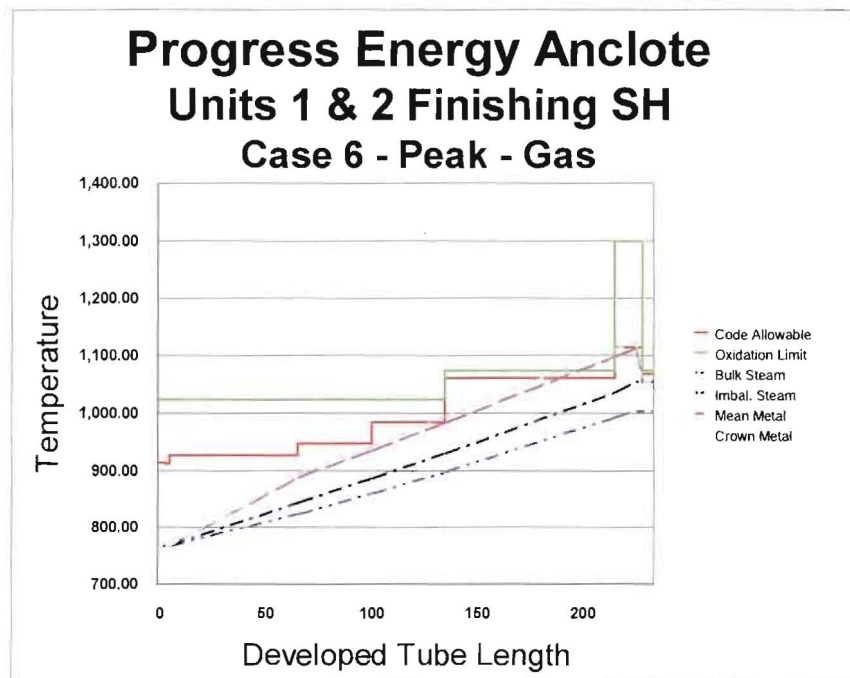
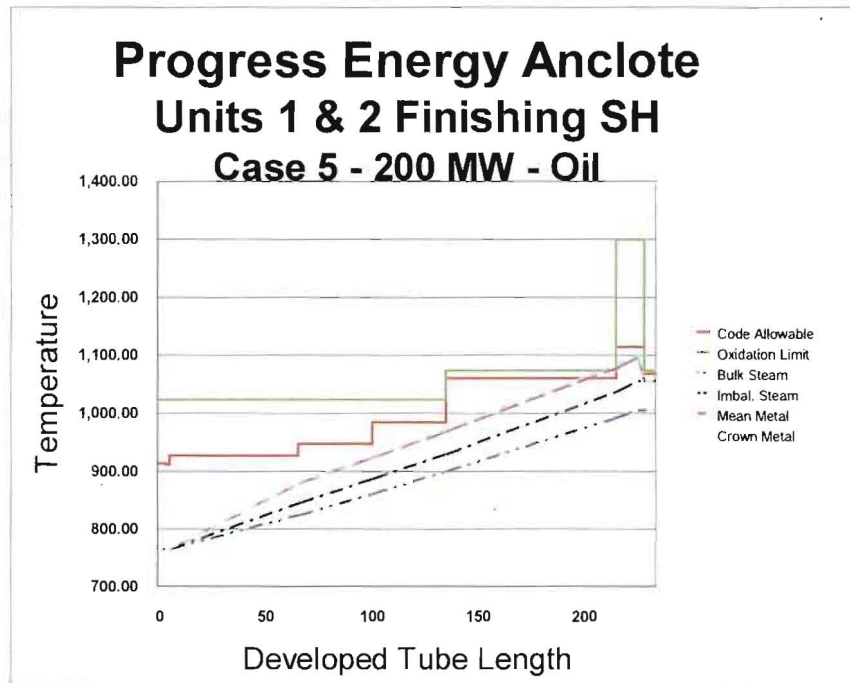
Progress Energy Anclore Units 1 & Platen & Primary SH Case 10 - 200 MW - Gas

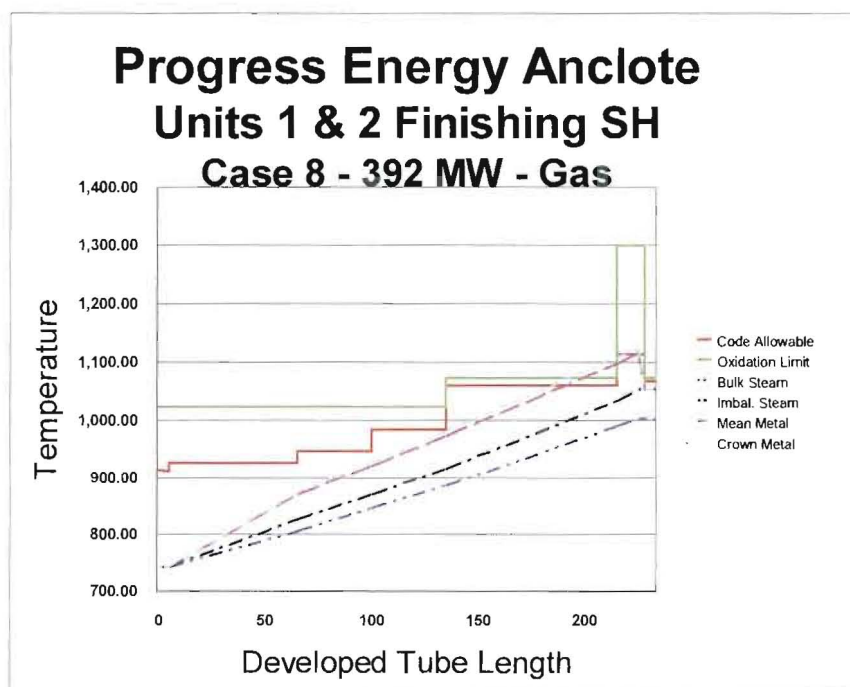
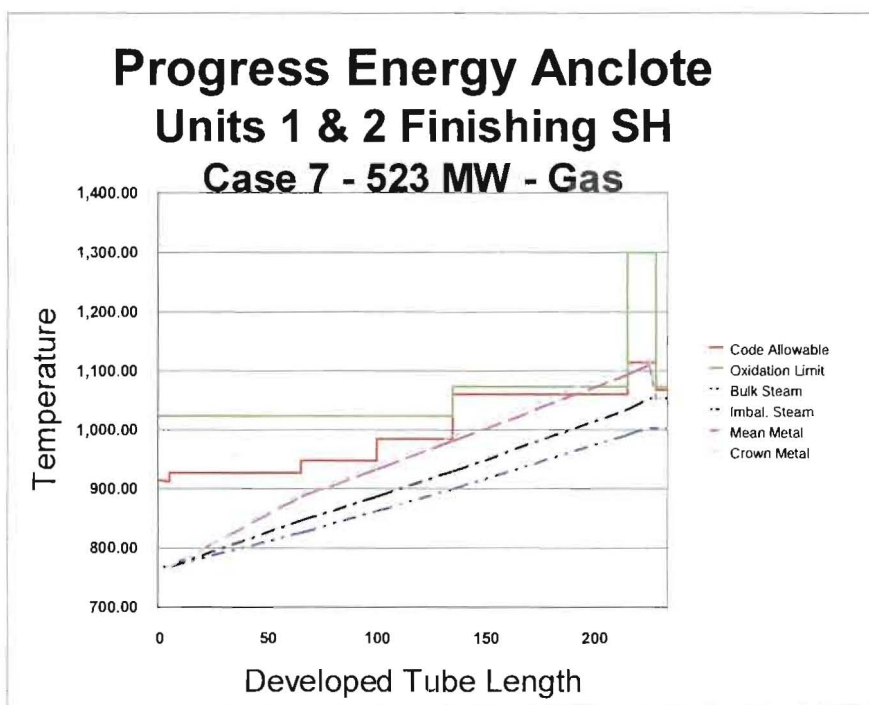


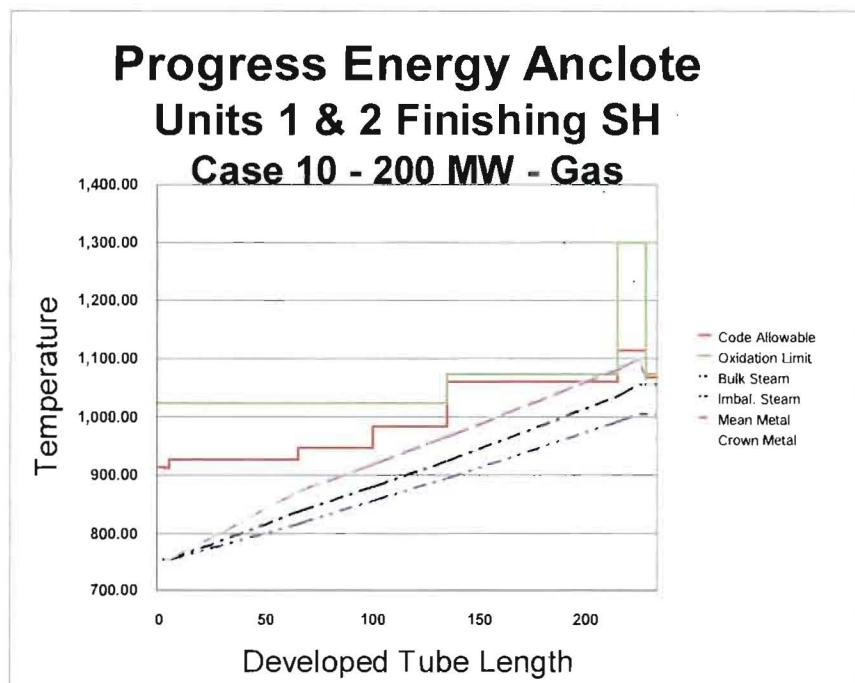
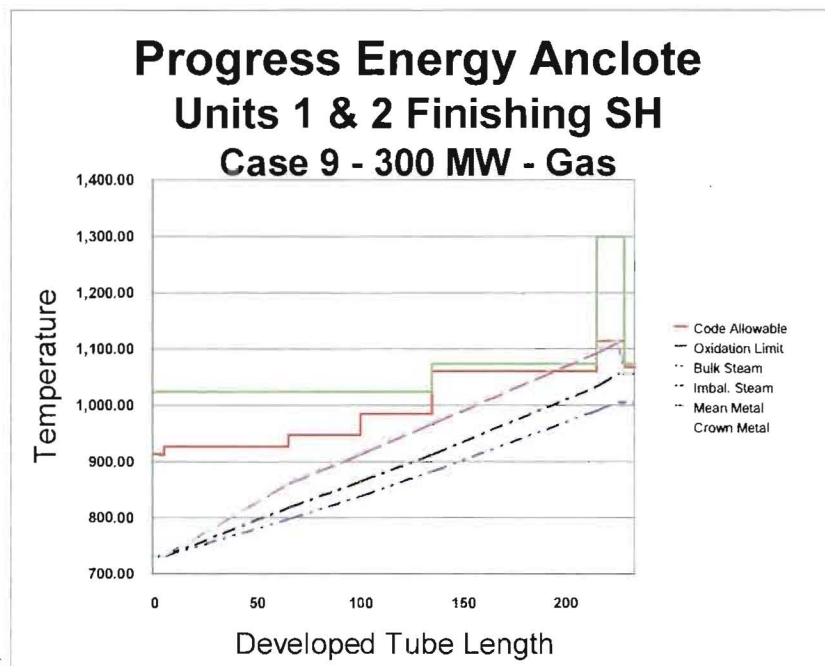
FINISHING SUPERHEATER



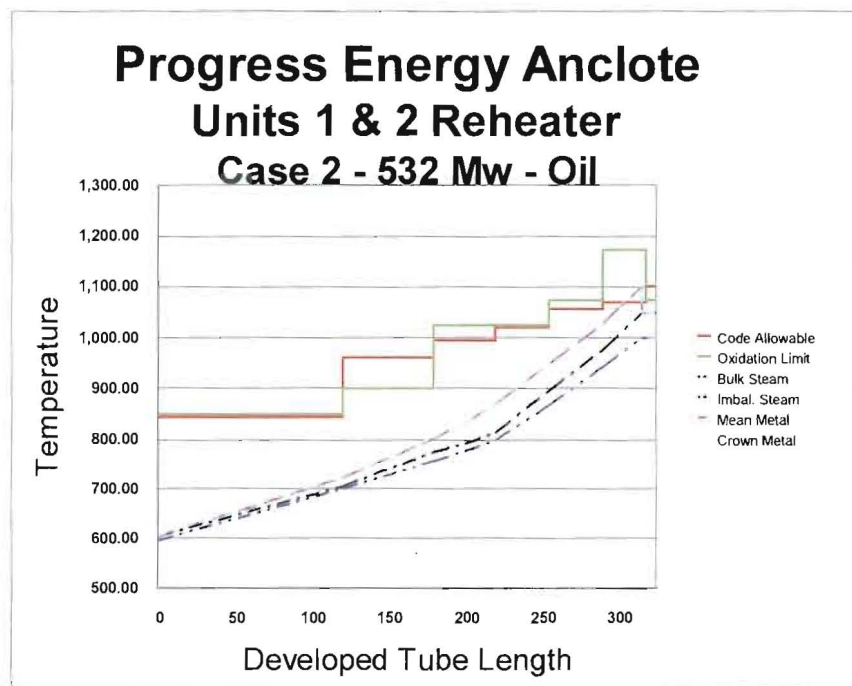
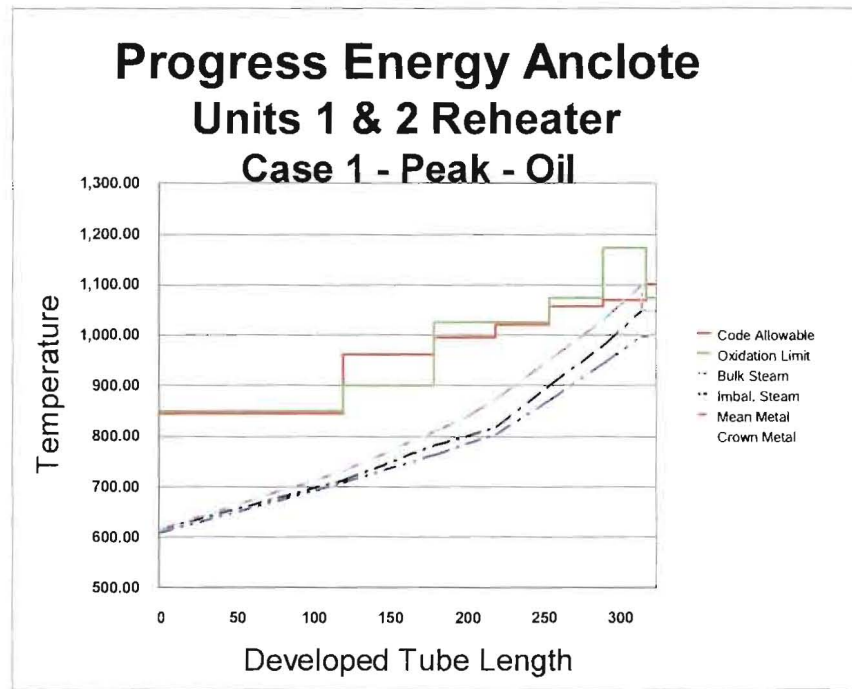


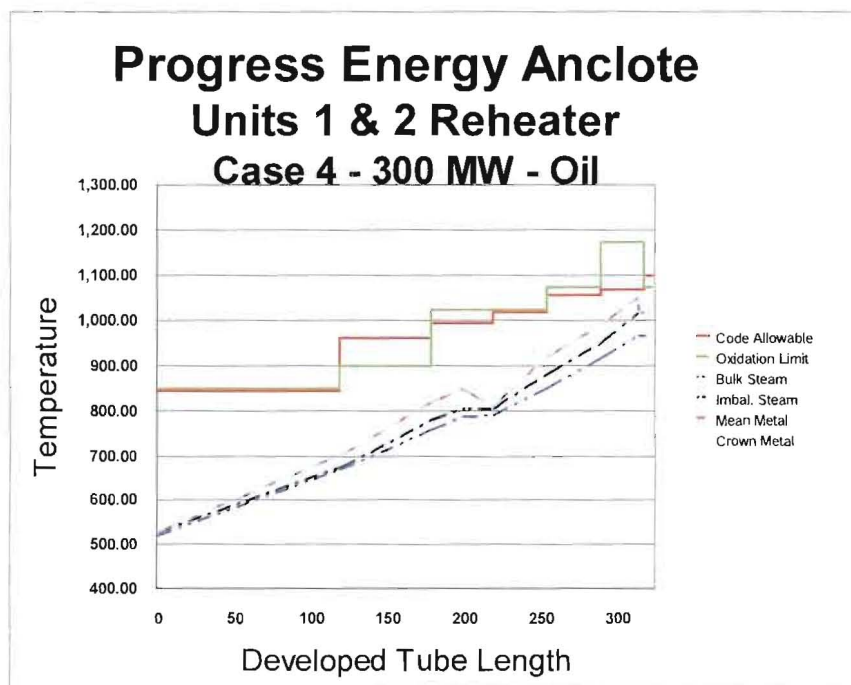
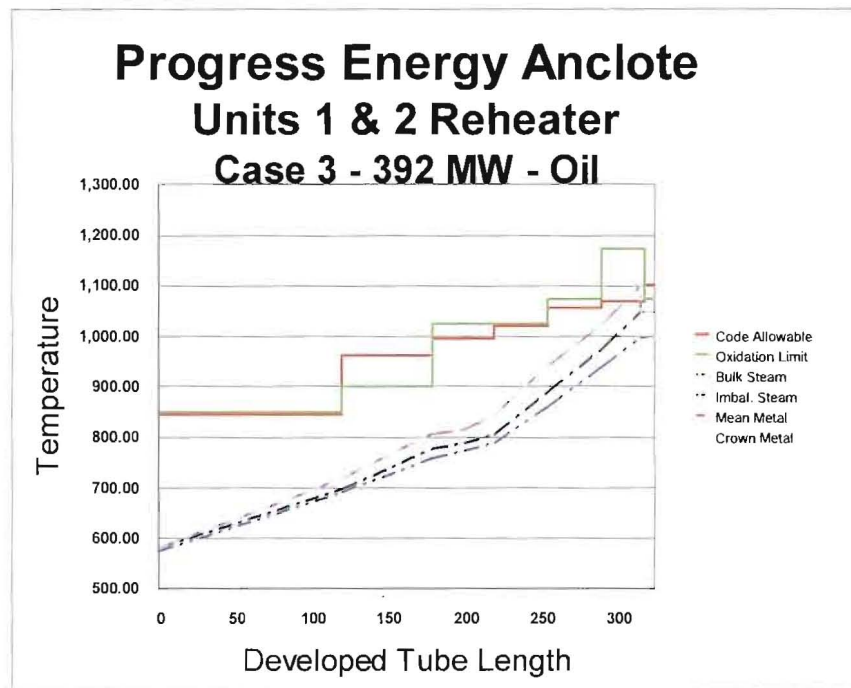


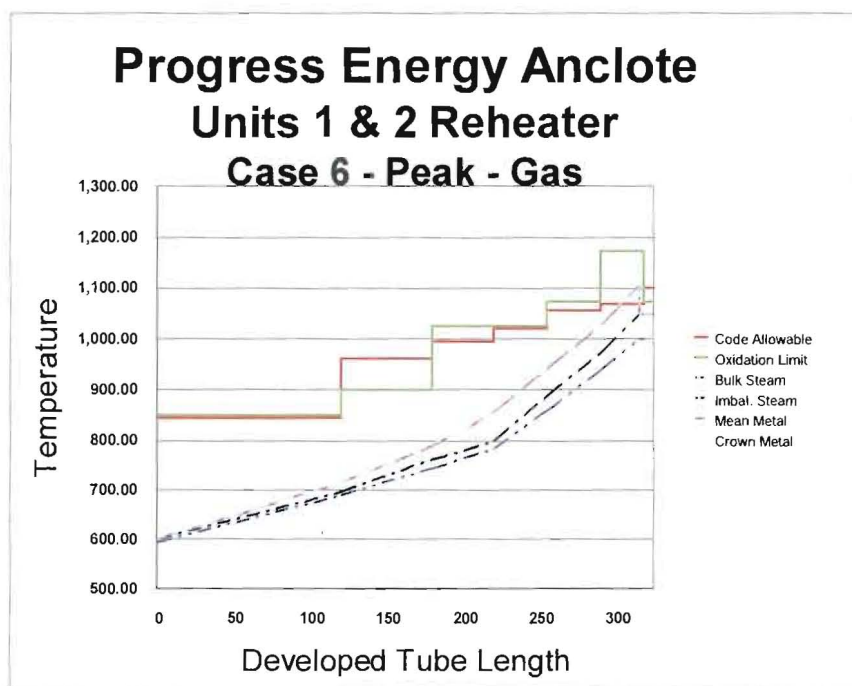
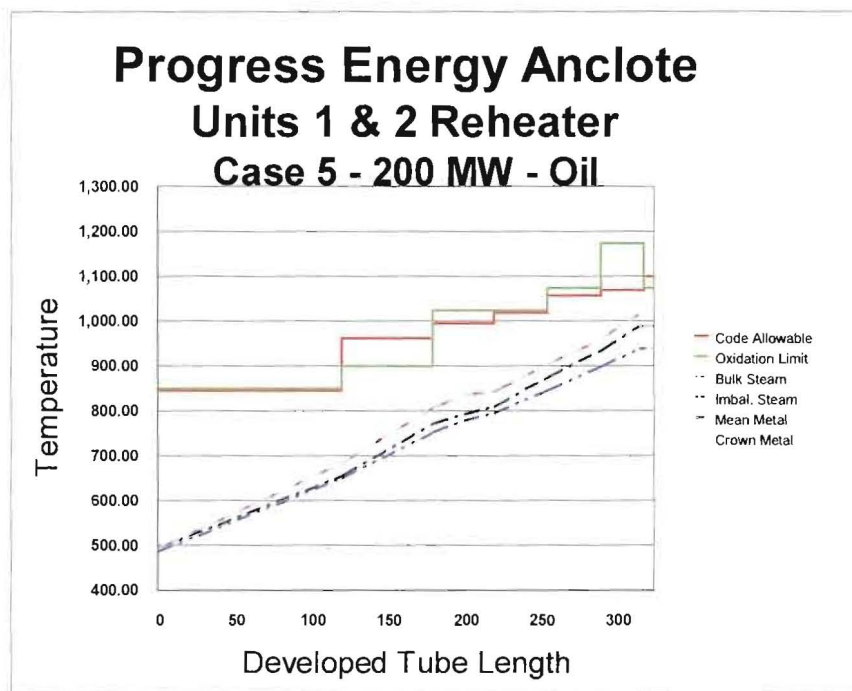


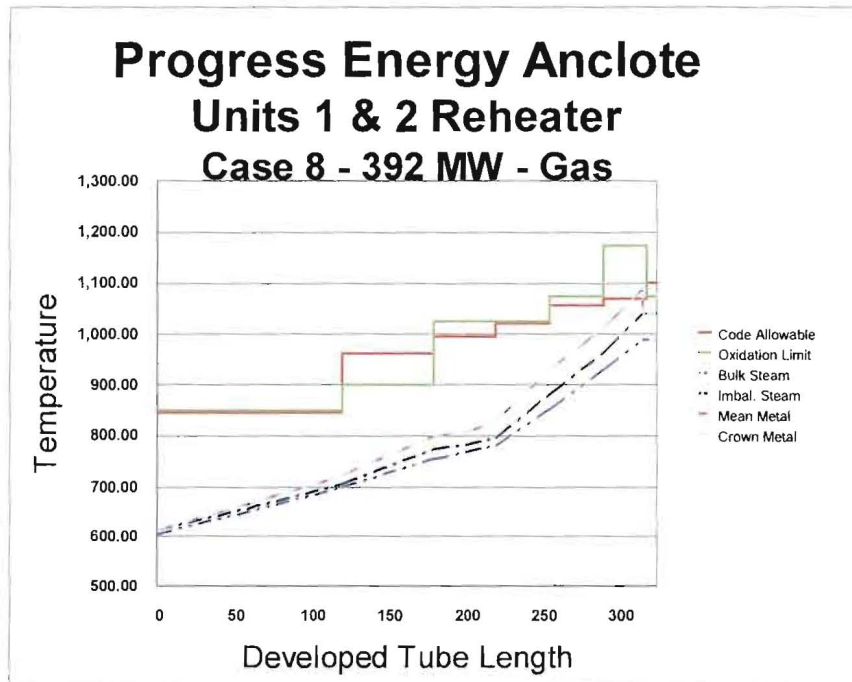
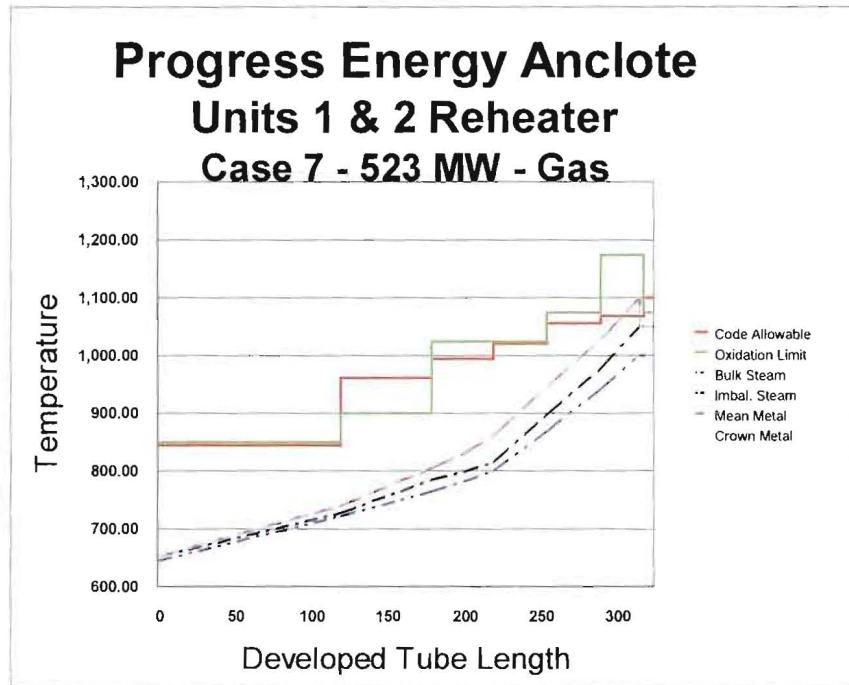


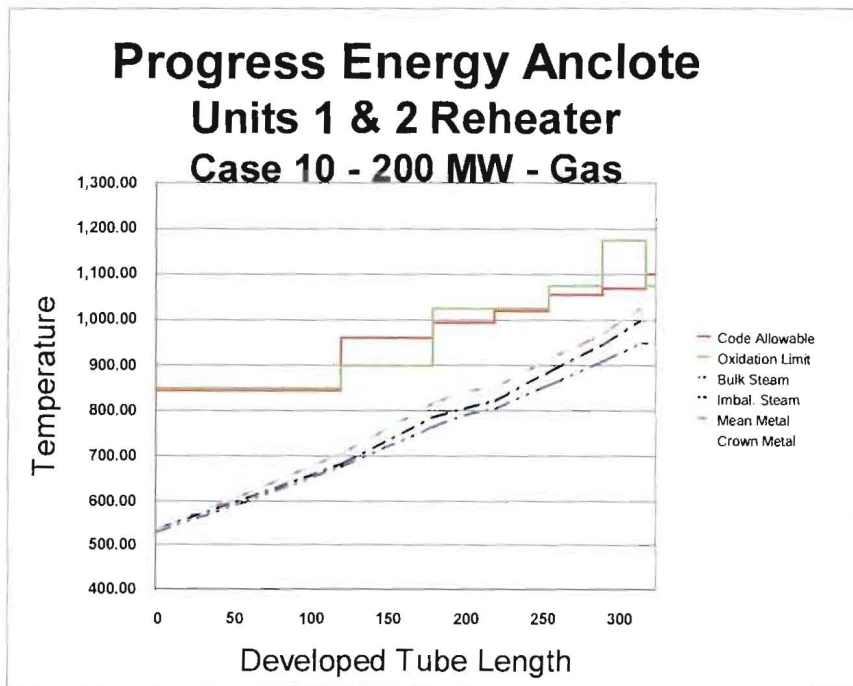
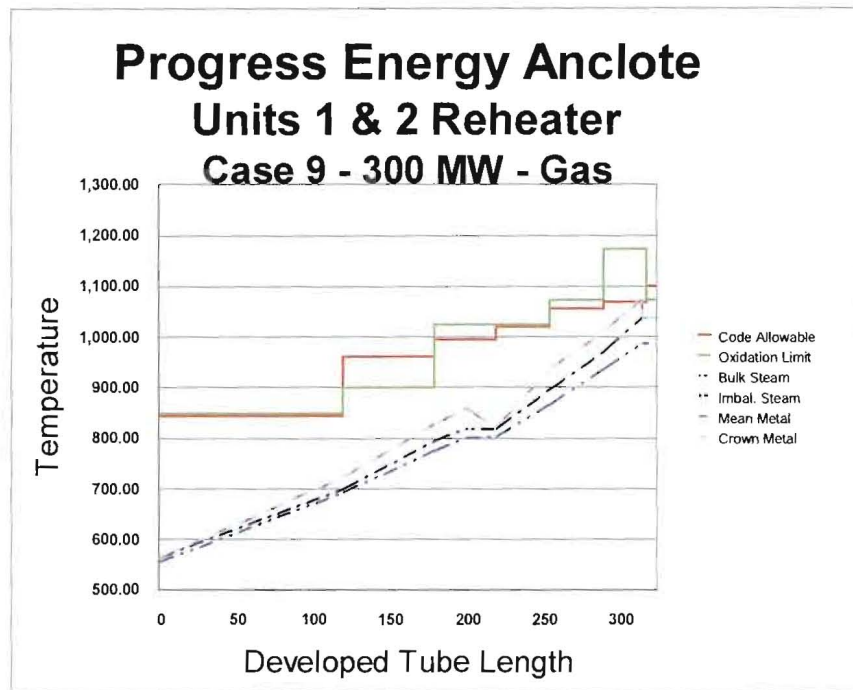
REHEATER











APPENDIX 5

BOILER PERFORMANCE ANALYSIS - Progress Energy Service Company, LLC for Anclote Station Units 1&2

Vibration Analysis
Oil - 523 MW Load - Base
Case

Steam Inlet Primary SH	Steam Outlet Primary SH	Steam Inlet Secondary SH	Steam Outlet Secondary SH	Steam Outlet Finishing RH	Steam Inlet Finishing RH	Steam Inlet Primary SH	Steam Outlet Primary SH	Steam Inlet Secondary SH	Steam Outlet Secondary SH	Steam Outlet Finishing RH	Steam Inlet Finishing RH	Screen	Screen	Steam Outlet Primary RH	Steam Inlet Primary RH	Steam Outlet Primary RH	Steam Inlet Primary RH
Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers	Section Between Stringers
Width	Width	Width	Width	Width	Width	Width	Width	Width	Width	Width	Width	Width	Width	Width	Width	Width	Width

GEOMETRIC DATA

Tube Bank Depth(Req'd for resonance)	ft	23.25	23.25	23.25	23.25	23.25	23.25	49.17	49.17	49.17	49.17	49.17	49.17	17.00	49.17	13.40	13.40	49.17	49.17
Tube Diameter	In	2.13	2.13	2.00	2.00	2.13	2.00	2.13	2.00	2.13	2.00	2.13	2.00	2.00	2.00	2.50	2.50	2.50	2.50
Transverse (Side) Spacing	In	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	10.00	10.00	5.00	5.00	5.00	5.00
Longitudinal (Back) Spacing	In	3.00	3.00	4.00	4.00	4.00	4.00	3.00	3.00	4.00	4.00	4.00	4.00	3.00	3.00	4.50	4.50	4.50	4.50
Section Height	ft	36.46	36.46	36.46	36.46	36.46	36.46	36.46	36.46	36.46	36.46	36.46	36.46	17.00	17.00	24.78	24.78	24.78	24.78
Section Width	ft	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17
Free Area	ft ²	1,030.77	1,030.77	1,075.64	1,075.64	1,030.82	1,075.64	1,030.77	1,030.77	1,075.64	1,075.64	1,030.82	1,075.64	668.71	668.71	609.22	609.22	609.22	609.22

OPERATIONAL DATA

Flue Gas Flow	lb/hr	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00	5,323,490.00
Tube Bank Gas Temperature	°F	2,087.00	1,900.00	1,900.00	1,491.00	1,491.00	1,274.00	2,087.00	2,080.47	2,080.47	1,696.48	1,696.48	1,470.62	1,134.00	1,134.00	1,033.00	832.00	1,033.00	832.00
Steam Temperature	°F	698.10	760.00	760.00	986.00	1,000.00	798.00	692.05	852.80	811.74	1,005.00	822.98	1,005.00	676.00	676.00	757.00	597.00	757.00	597.00
LMTD	°F	1,381.39	1,132.48	1,132.48	497.46	483.46	468.46	1,387.44	1,220.16	1,261.22	683.95	865.98	458.08	450.46	450.46	268.43	227.42	268.43	227.42
TI	°F	1,388.79	1,326.24	1,326.24	1,234.73	1,241.73	1,032.23	1,385.77	1,462.88	1,442.35	1,346.97	1,255.97	1,234.04	901.23	901.23	891.22	710.71	891.22	710.71
Gas Mass Flow	lb/hr	5,164.59	5,164.59	4,949.12	4,949.12	5,164.30	4,949.12	5,164.59	5,164.59	4,949.12	4,949.12	5,164.30	4,949.12	7,960.81	7,960.81	8,738.26	8,738.26	8,738.26	8,738.26
Kre	ft ² /hr	2.00	2.05	1.95	1.95	2.05	2.00	1.30	1.50	1.80	2.00	2.00	2.00	2.05	2.05	2.50	3.00	2.50	3.00
Barometric Pressure	inHg	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92
Gas Specific Volume	ft ³ /lb	63.08	58.45	58.45	48.32	48.32	42.94	63.08	62.92	62.92	53.41	53.41	47.81	39.48	39.48	36.98	32.00	36.98	32.00
Gas Volumetric Flow	ft ³ /sec	93.278	86.430	86.430	71.451	71.451	63.504	93.278	93.039	93.039	78.978	78.978	70.704	58.377	58.377	54.678	47.317	54.678	47.317
Tube Bank Outlet Gas Velocity	ft/Sec	90.49	83.85	80.35	66.43	69.31	59.04	90.49	90.26	86.50	73.42	76.61	65.73	87.30	87.30	89.75	77.67	89.75	77.67
Gas Viscosity	lb-ft/hr	0.120	0.115	0.105	0.095	0.100	0.095	0.095	0.115	0.115	0.110	0.095	0.100	0.085	0.085	0.080	0.075	0.080	0.075
Gas Stream Reynolds Number		8,493.10	8,493.10	9,378.00	9,378.00	10,203.00	10,203.00	6,478.13	6,478.13	7,330.95	7,330.95	6,765.00	6,765.00	16,772.00	16,772.00	23,270.00	23,270.00	23,270.00	23,270.00
Acoustical Constant		46.58	46.67	46.67	46.91	46.91	47.07	46.58	46.59	46.59	46.78	46.78	46.93	47.19	47.19	47.27	47.46	47.27	47.46

FLUE GAS VORTEX SHEDDING
(VSF)

Strouhal Number		0.37	0.37	0.33	0.33	0.37	0.37	0.37	0.37	0.33	0.33	0.37	0.37	0.37	0.37	0.50	0.50	0.50	0.50
Chen Number (See Note 1)		830.88	830.88	2,813.40	2,813.40	2,578.15	2,760.81	633.75	633.75	2,199.28	2,199.28	1,709.42	1,830.53	1,008.51	1,008.51	4,596.54	4,596.54	4,596.54	4,596.54
Vortex Shedding Frequency	CPS	188.86	174.99	160.70	132.85	144.66	130.91	188.86	188.37	172.99	146.84	159.89	145.75	193.57	193.57	215.40	186.40	215.40	186.40

TUBE BANK NATURAL FREQUENCY
(NF)

Speed of Sound in Flue Gas	ft/Sec	2,350.96	2,267.23	2,267.23	2,072.18	2,072.18	1,960.15	2,350.96	2,348.09	2,348.09	2,172.46	2,172.46	2,061.94	1,883.88	1,883.88	1,826.59	1,705.90	1,826.59	1,705.90
First Mode Natural Frequency	CPS	50.56	48.78	48.76	44.56	44.56	42.15	23.91	23.88	23.88	22.09	22.09	20.97	55.41	19.16	68.16	63.85	18.57	17.35

BOILER PERFORMANCE ANALYSIS - Progress Energy Service Company, LLC for Anclote Station Units1&2

Second Mode Natural Frequency	CPS	101.12	97.52	97.52	89.13	89.13	84.31	47.81	47.75	47.75	44.18	44.18	41.93	110.82	38.31	136.31	127.31	37.15	34.69
Third Mode Natural Frequency	CPS	151.88	146.27	146.27	133.69	133.69	126.46	71.72	71.63	71.63	66.27	66.27	62.90	166.22	57.47	204.47	190.96	55.72	52.04
Fourth Mode Natural Frequency	CPS	202.23	195.03	195.03	178.25	178.25	168.62	95.63	95.51	95.51	88.37	88.37	83.87	221.63	76.63	272.62	254.61	74.30	69.39

OVERALL TUBE BANK
RESONANCE

First Mode NF to VSF	% Diff	273.54	258.90	229.60	198.12	224.61	210.55	689.98	688.92	624.51	564.71	623.77	595.14	249.36	910.46	216.04	192.84	1,059.68	974.56
Second Mode NF to VSF	% Diff	86.77	79.45	64.80	49.06	62.31	55.28	294.99	294.46	262.25	232.36	261.89	247.57	74.68	405.23	58.02	46.42	479.84	437.28
Third Mode NF to VSF	% Diff	24.51	19.63	9.87	(0.63)	8.20	3.52	163.33	162.97	141.50	121.57	141.26	131.71	16.45	236.82	5.35	(2.39)	286.56	258.19
Fourth Mode NF to VSF	% Diff	(8.61)	(10.28)	(17.60)	(25.47)	(18.85)	(22.36)	97.50	97.23	81.13	66.18	80.94	73.79	(12.66)	152.61	(20.99)	(26.79)	189.92	168.64

Note 1 If Chen Number is <2000, the likelihood of a resonant condition occurring is low

PEF-120103-EI-00214

BOILER PERFORMANCE ANALYSIS – Progress Energy Service Company, LLC for Anclote Station Units 1&2

Vibration Analysis
Nat Gas – 523 MW Load

Steam Inlet Primary SH Section Between Stringers	Steam Outlet Primary SH Section Between Stringers	Steam Inlet Secondary SH Section Between Stringers	Steam Outlet Secondary SH Section Between Stringers	Steam Outlet Finishing RH Section Between Stringers	Steam Inlet Finishing RH Section Between Stringers	Steam Inlet Primary SH Section Width	Steam Outlet Primary SH Section Width	Steam Inlet Secondary SH Section Width	Steam Outlet Secondary SH Section Width	Steam Outlet Finishing RH Section Width	Steam Inlet Finishing RH Section Width	Screen Height	Screen Width	Steam Outlet Primary RH Section Between Stringers	Steam Inlet Primary RH Section Between Stringers	Steam Outlet Primary RH Section Width	Steam Inlet Primary RH Section Width
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GEOMETRIC DATA

Tube Bank Depth(Req'd for resonance)	ft	23.25	23.25	23.25	23.25	23.25	23.25	49.17	49.17	49.17	49.17	49.17	49.17	17.00	49.17	13.40	13.40	49.17	49.17
Tube Diameter:	in	2.13	2.13	2.00	2.00	2.13	2.00	2.13	2.13	2.00	2.00	2.13	2.00	2.00	2.50	2.50	2.50	2.50	2.50
Transverse (Side) Spacing	in	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	10.00	10.00	5.00	5.00	5.00	5.00	5.00
Longitudinal (Back) Spacing	in	3.00	3.00	4.00	4.00	4.00	4.00	3.00	3.00	4.00	4.00	4.00	4.00	3.00	3.00	4.50	4.50	4.50	4.50
Section Height	ft	36.46	36.46	36.46	36.46	36.46	36.46	36.46	36.46	36.46	36.46	36.46	36.46	17.00	17.00	24.78	24.78	24.78	24.78
Section Width	ft	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17	49.17
Free Area	ft ²	1,030.77	1,030.77	1,075.64	1,075.64	1,030.82	1,075.64	1,030.77	1,030.77	1,075.64	1,075.64	1,030.82	1,075.64	668.71	668.71	609.22	609.22	609.22	609.22

OPERATIONAL DATA

Flue Gas Flow	lb/hr	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00	4,370,253.00
Tube Bank Gas Temperature	°F	2,202.00	1,979.00	1,979.00	1,501.00	1,501.00	1,259.00	2,202.00	1,979.00	1,979.00	1,501.00	1,501.00	1,259.00	1,097.00	1,097.00	987.00	832.00	987.00	832.00
Steam Temperature	°F	701.00	770.00	770.00	1,005.00	1,000.00	801.00	701.00	770.00	770.00	1,005.00	1,000.00	801.00	676.00	676.00	767.00	644.00	767.00	644.00
LMTD	°F	1,493.49	1,201.48	1,201.48	488.46	493.46	450.46	1,493.49	1,201.48	1,201.48	488.46	493.46	450.46	413.45	413.45	212.41	180.40	212.41	180.40
Tf	°F	1,447.74	1,370.74	1,370.74	1,249.23	1,246.73	1,026.23	1,447.74	1,370.74	1,370.74	1,249.23	1,246.73	1,026.23	882.73	882.73	873.21	734.20	873.21	734.20
Gas Mass Flow	lb/ft ² - hr	4,239.80	4,239.80	4,062.92	4,062.92	4,239.57	4,062.92	4,239.80	4,239.80	4,062.92	4,062.92	4,239.57	4,062.92	6,535.33	6,535.33	7,173.57	7,173.57	7,173.57	7,173.57
Kre	ft ² - hr/lb	2.00	2.05	1.95	1.95	2.05	2.00	2.00	2.05	1.95	1.95	2.05	2.00	2.05	2.05	2.50	3.00	2.50	3.00
Barometric Pressure	inHg	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92
Gas Specific Volume	ft ³ /lb	65.93	60.40	60.40	48.57	48.57	42.57	65.93	60.40	60.40	48.57	48.57	42.57	38.56	38.56	35.84	32.00	35.84	32.00
Gas Volumetric Flow	ft ³ /sec	80.033	73.328	73.328	58.957	58.957	51.682	80.033	73.328	73.328	58.957	58.957	51.682	46.811	46.811	43.504	38.844	43.504	38.844
Tube Bank Outlet Gas Velocity	ft/Sec	77.64	71.14	68.17	54.81	57.19	48.05	77.64	71.14	68.17	54.81	57.19	48.05	70.00	70.00	71.41	63.76	71.41	63.76
Gas Viscosity	lb-ft/hr	0.120	0.115	0.105	0.095	0.100	0.095	0.120	0.115	0.105	0.095	0.100	0.095	0.085	0.085	0.080	0.075	0.080	0.075
Gas Stream Reynolds Number		6,833.00	6,833.00	7,622.00	7,622.00	8,379.00	8,379.00	6,833.00	6,833.00	7,622.00	7,622.00	8,379.00	8,379.00	13,896.00	13,896.00	19,114.00	19,114.00	19,114.00	19,114.00
Acoustical Constant		46.54	46.83	46.63	46.91	46.91	47.06	46.54	46.63	46.63	46.91	46.91	47.06	47.22	47.22	47.31	47.46	47.31	47.46

FLUE GAS VORTEX SHEDDING
(VSF)

Strouhal Number		0.37	0.37	0.33	0.33	0.37	0.37	0.37	0.37	0.33	0.33	0.37	0.37	0.37	0.37	0.50	0.50	0.50	0.50
Chen Number (See Note 1)		668.47	668.47	2,286.60	2,286.60	2,117.25	2,267.26	668.47	668.47	2,286.60	2,286.60	2,117.25	2,267.26	835.70	835.70	3,775.60	3,775.60	3,775.60	3,775.60
Vortex Shedding Frequency	CPS	162.04	148.47	136.34	109.62	119.36	106.54	162.04	148.47	136.34	109.62	119.36	106.54	155.22	155.22	171.38	153.03	171.38	153.03

TUBE BANK NATURAL
FREQUENCY (NF)

Speed of Sound in Flue Gas	ft/Sec	2,401.09	2,302.97	2,302.97	2,077.18	2,077.18	1,952.14	2,401.09	2,302.97	2,302.97	2,077.18	2,077.18	1,952.14	1,863.13	1,863.13	1,799.79	1,705.90	1,799.79	1,705.90
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BOILER PERFORMANCE ANALYSIS - Progress Energy Service Company, LLC for Anclote Station Units 1&2

First Mode Natural Frequency	CPS	51.64	49.53	49.53	44.67	44.67	41.98	24.42	23.42	23.42	21.12	21.12	19.85	54.80	18.95	67.16	63.65	18.30	17.35
Second Mode Natural Frequency	CPS	103.27	99.05	99.05	89.34	89.34	83.96	48.83	46.84	46.84	42.24	42.24	39.70	109.60	37.89	134.31	127.31	36.60	34.69
Third Mode Natural Frequency	CPS	154.91	148.58	148.58	134.01	134.01	125.94	73.25	70.26	70.26	63.37	63.37	59.55	164.39	56.84	201.47	190.96	54.91	52.04
Fourth Mode Natural Frequency	CPS	206.55	198.10	198.10	178.68	178.68	167.93	97.66	93.67	93.67	84.49	84.49	79.40	219.19	75.78	268.63	254.61	73.21	69.39

OVERALL TUBE BANK
RESONANCE

First Mode NF to VSF	% Diff	213.81	199.77	175.30	145.40	167.21	153.78	563.66	533.97	482.21	418.99	465.10	436.70	183.26	719.29	155.20	140.41	836.43	782.15
Second Mode NF to VSF	% Diff	56.90	49.89	37.65	22.70	33.60	26.89	231.83	216.98	191.10	159.49	182.55	168.35	41.63	309.65	27.60	20.20	368.22	341.07
Third Mode NF to VSF	% Diff	4.60	(0.08)	(8.23)	(18.20)	(10.93)	(15.41)	121.22	111.32	94.07	73.00	88.37	78.90	(5.58)	173.10	(14.93)	(19.86)	212.14	194.05
Fourth Mode NF to VSF	% Diff	(21.55)	(25.06)	(31.18)	(38.65)	(33.20)	(36.56)	65.91	58.49	45.55	29.75	41.27	34.17	(29.18)	104.82	(36.20)	(39.90)	134.11	120.54

Note 1: If Chen Number is <2000, the likelihood of a resonant condition occurring is low.

PEF-120103-EI-00216

Anclore Gas Conversion Study Update

Sept. 26, 2011

Strategic Engineering

Strategic Engineering was tasked with performing a techno-economic feasibility study to understand the equipment and operation impacts of converting the Anclore units to 100% gas firing capability. SE partnered with Sirois Engineering to perform the technical study in July 2011. This document will provide updates on the progress of the study.

Thermal Analysis & Results *(Updated September 8)*

Sirois Engineering completed a thermal analysis that defined the required pressure part modifications to the furnace. The scope of the changes is listed below. The diagram in Appendix A shows a sketch of the proposed modifications.

1. Removal of the Lower SH Tube Bank
2. Replacement of lower tube row of the Intermediate Superheat Section from P11 to P22
3. Perform condition assessment of Lower SH Outlet Header (header replacement does not have to be performed in conjunction with gas conversion)

Sirois engineering is completed a tube to tube analysis comparing predicted temperature to ASME allowable working pressures and industry accepted levels of oxidizing temperature limits for all actual and predicted cases representing different fuels and load points. The analysis represented characteristics with the modified PSH surface that are required. Overall, there is not a significant difference in conditions between firing oil or gas.

Economic Estimate *(Updated September 8)*

A high level economic estimate that was developed is shown below:

Work Scope	Cost Per Unit (\$M)
Gas Burner & Air Flow Measurement Equipment	\$5.5
Lower SH Tube Bank Removal	\$1.0
Lower SH Header Replacement *	\$1.0
Controls Upgrades	\$0.9
BMS Upgrades **	\$0.3
Contingency	\$1.3
Estimated Project Total	\$10.0

* This is a recommendation from Sirois Engineering. Replacement will be contingent on condition assessment and could be completed after the gas conversion.

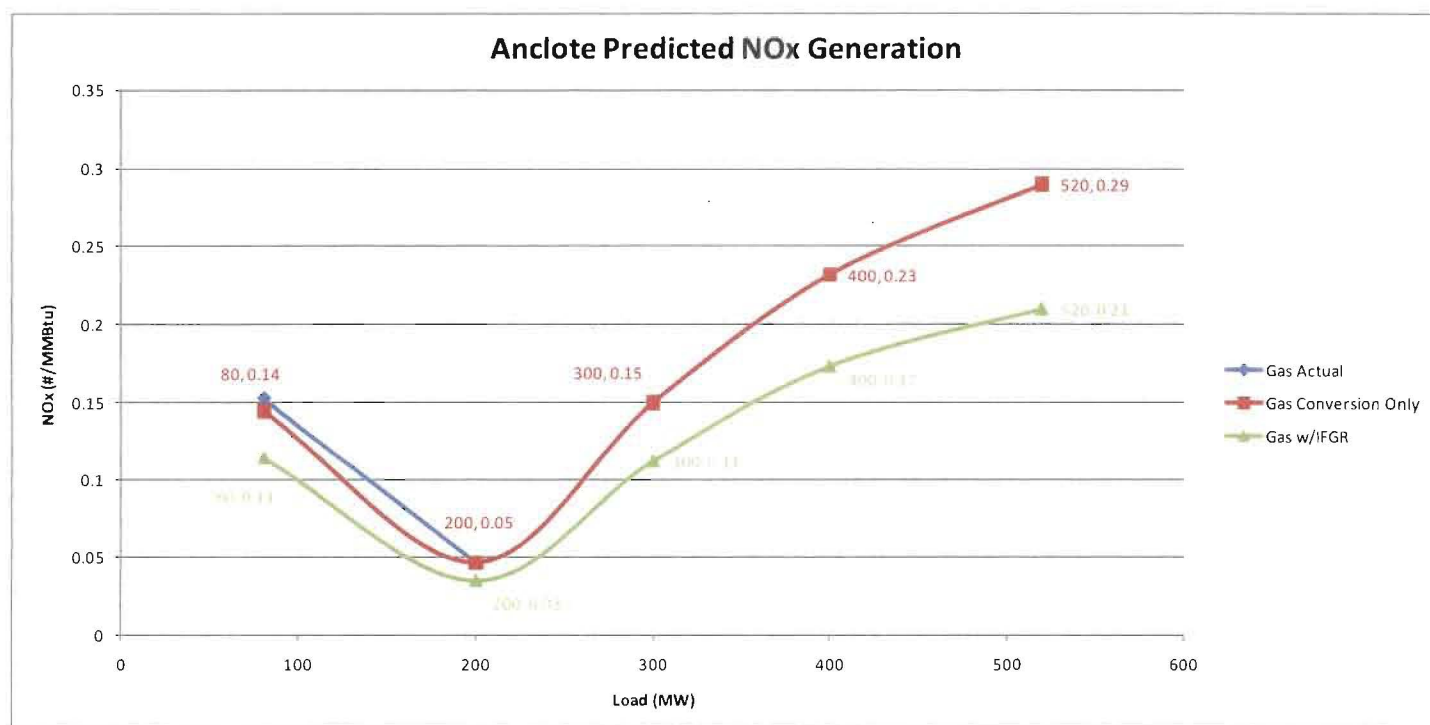
** This is a placeholder. A more accurate estimate expected from 3rd party vendor.

A more detailed economic estimate is currently being developed with G&TC. SE will work with G&TC to finalize this document.

Unit Emission Impacts *(Updated September 6)*

A summary of emission impacts & their basis is shown in the table below.

Pollutant	Configuration	Predicted Impact	Basis
Nitrogen Oxides (NOx)	Without IFGR	See Chart Below	100-200 MW NOx based off actual unit CEMs data (August 2011). For 200+ MW range, 25% reduction from oil was applied based off 30% predicted reduction from AP-42 & EPRI Data.
	With IFGR	See Chart Below	Induced Flu Gas Recirculation (IFGR) NOx predictions based off additional 25% reduction from gas only based from AP-42 and EPRI predictions of 31% reduction.
Carbon Monoxide (CO)	Without IFGR	20% Reduction	AP-42 Natural Gas Combustion Guidelines (Predicted 37% Reduction with no IFGR)
	With IFGR	Increased CO emissions over base gas expected. Predicted levels TBD.	
Particulate Matter (PM)	N/A	90% Reduction	AP-42 Natural Gas Combustion
Volatile Organic Compounds (VOC)	N/A	0.0054 #/MMBtu	AP-42 Natural Gas Combustion



Unit Load Capacity & Heat Rate Impacts (Updated September 8)

A summary of heat rate and load capacity impacts is shown in the tables below.

Predicted Load Impacts		Basis
Gross Load	No Impacts	Sirois Engineering Study
Net Load	Approximate 10 MW Increase	Aux. Load Savings from Fuel Oil Booster Pumps, Fuel Oil Burner Pumps & Fuel Oil Heaters

Predicted Heat Rate Impacts (% Change from Baseline Oil)			
Load (MW)	Net Plant Heat Rate Change with oil auxiliaries in operation (Btu/kW)	Net Plant Heat Rate Change without oil auxiliaries in operation (Btu/kW)	Gross Plant Heat Rate Change (Btu/kW)
525	3.00%	1.07%	3.00%
400	2.99%	0.43%	2.99%
300	4.19%	0.83%	4.19%
200	4.16%	(0.80%)	4.16%

There is no change to Gross Plant Heat Rate as compared to Net Plant Heat Rate because the heat input and kW change compared to net values remain the same.

Gas Firing Impacts (Updated September 6)

In response to the question related to the long term impact to boiler reliability/remaining life when converting the fuel source from heavy fuel oil to natural gas, the following recommendations were communicated by Sirois Engineering. A corresponding diagram can be found in Appendix B.

1. The major potential deleterious impact is that tube metal temperatures in the platen superheater, the finishing superheater and the reheater sections will tend to rise. In the case of Ancloste, because we are recommending a significant heating surface reduction in the primary superheater, the temperatures will actually be lower for the majority of the finishing superheater. The level of temperature rise is usually less than 50F, which for materials that are presently in good condition and are predicted to operate within the ASME Code allowable range, should not significantly affect the remaining life of that component. The results of the metals analysis are forthcoming.
2. We have already discussed the potential for upgrading the lower front wall junction header should an inspection of this header fabricated with C steel justify it. Further sections of the platen superheater have already been modified with higher alloy material.
3. The economizer, in the case of Ancloste, is not expected to be in jeopardy of steaming. Therefore, no reliability issues are contemplated.

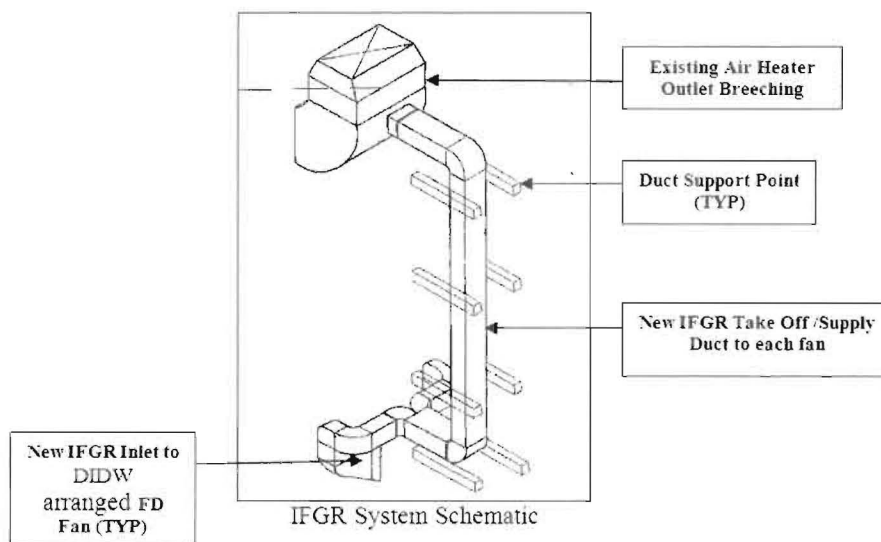
4. Generally, there is a positive correlation between fuel sulfur content and reliability degradation and increased maintenance costs. Therefore, the conversion of Anclore should result in equivalent or slightly reduced maintenance requirements, long term.

Regional Engineering has performed tube bank condition assessments during recent outages. Reports for these assessments are available in PlantView or through South Region Engineering.

Induced Flue Gas Recirculation (Updated September 22)

Induced FGR is an alternative method of NO_x reduction using recirculated flue gas. Unlike forced FGR, which utilizes injection of hot flue gas into mixing devices in the hot combustion air supply ducting, induced FGR utilizes the forced draft (FD) fan to provide the motive force and mixing flue gas with combustion air. Typically, this technique is more limited in the fraction of recirculated flue gas – usually a maximum of 10 to 12 percent (of the total flue gas leaving the air pre-heater, depending on the dispatch requirements and the capacity of the FD fan & driver system. This design provides for correspondingly lower (generally a maximum of ~50 percent of uncontrolled level) NO_x reduction. This method is also comparatively much less costly and quicker to implement on a retrofit basis.

The IFGR concept is depicted below.



IFGR requires some additional FD fan margin due to increase flow introduced into the fan system. Because of the pre-existing capacity limits on the FD fans at Anclore, this concept may not be achievable. SE has developed some alternative strategy options for IFGR:

Option	Unit Impacts	Approximate Capital Cost
Induced Flue Gas Using Existing FD Fan (Derate Unit(s) due to FD fan capacity)	10-15% unit derate	\$2M *
Induced Flue Gas Using Existing FD Fan (No Derate – Operate units in “Low NOx Operation” at part load)	No IFGR NOx control at loads less than approx. 400 MW	\$2M *
Induced Flue Gas Using Existing FD Fan (Hybrid of both options above – utilize FGR only when it is economically and operationally viable)	NOx reduction would be traded for peak load. IFGR system would be utilized as needed depending on NOx limitations and load demand	\$2M *
New FD Fan	Increased Fan Margin	N/A
Reuse existing FGR Fan w/new ductwork to AH Air Outlet	Reduced FGR Margin	N/A **

* Costs derived from EPRI Guidelines for Induced Flue Gas Recirculation (2000) and escalated 8% to 2012 \$US

** Costs contingent on additional fan study from Sirois Engineering

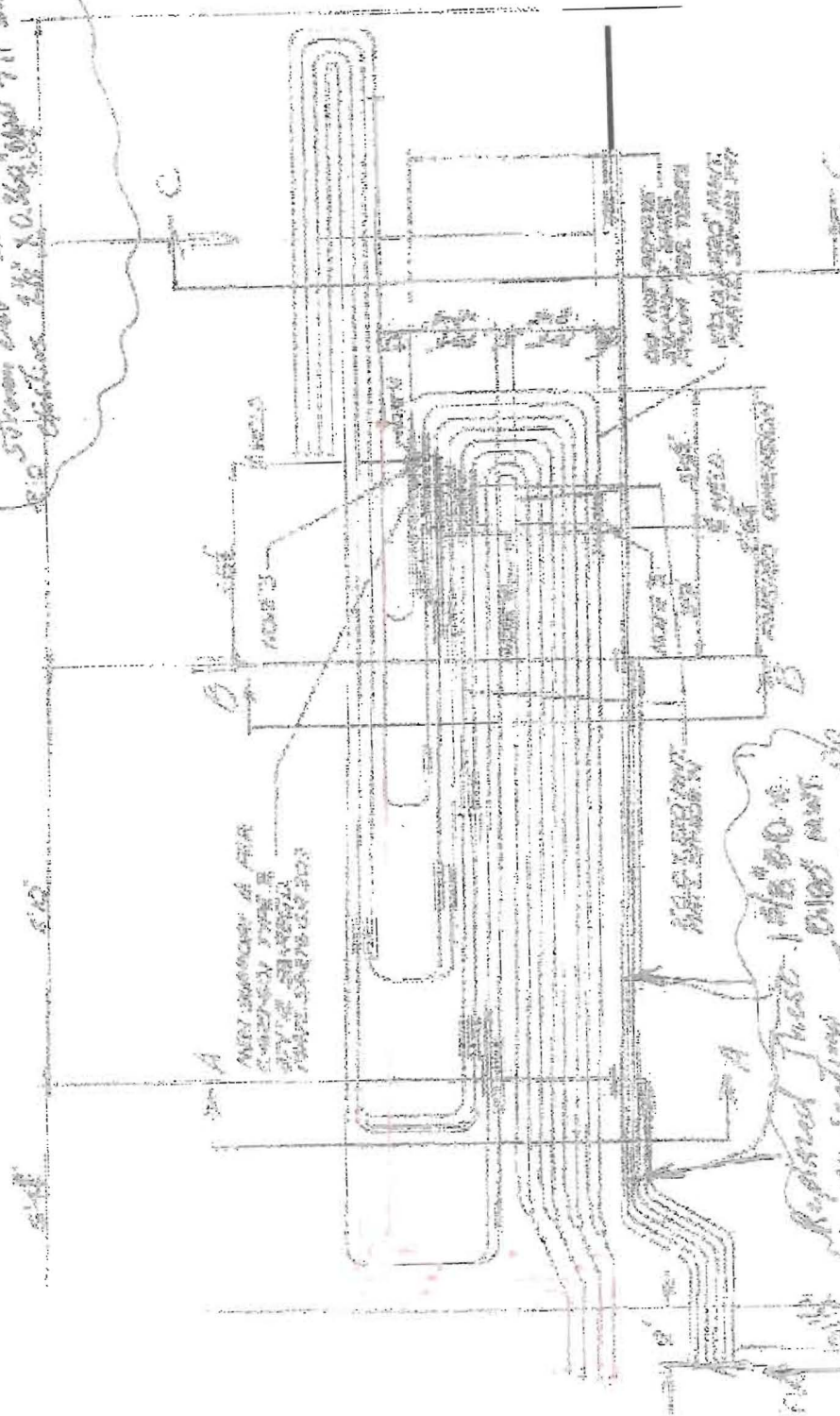
Re-Routing the Flue Gas Recirculation would entail introduction of a slip stream of the GRF into the Secondary Air duct stream into or upstream of the windbox but downstream of the Air Heater system. Additional analysis needs to be performed on the existing Gas Recirculation Fan to determine the extent of the necessary modifications & technical feasibility. SE has requested a quote from Sirois Engineering to perform the feasibility analysis on such a configuration using existing Gas Recirc Fan.

Deliverable Status (Updated September 19)

Scope Item	Responsible Party	Support	Status
Gas Burner Equipment Estimate	SE	RV Industries / Coen / AMC	Complete
Boiler Thermal Analysis	SE	Sirois Engineering	Complete
Boiler Tube to Tube Analysis	SE	Sirois Engineering	Complete
Pressure Part Modifications Estimate	SE	SE/Regional Engineering	Complete
Emissions Predictions	SE	Sirois Engineering / RV / EPRI / EPA	Complete
Controls / BMS Upgrades	SE	Coen / Stantec	Controls Complete
Furnace Vibration & Fan Analysis *	SE	Sirois Engineering	Complete
Draft Report on Ancloze Study *	SE	Sirois Engineering	Complete

* Results of these items are not expected to impact project cost or schedule

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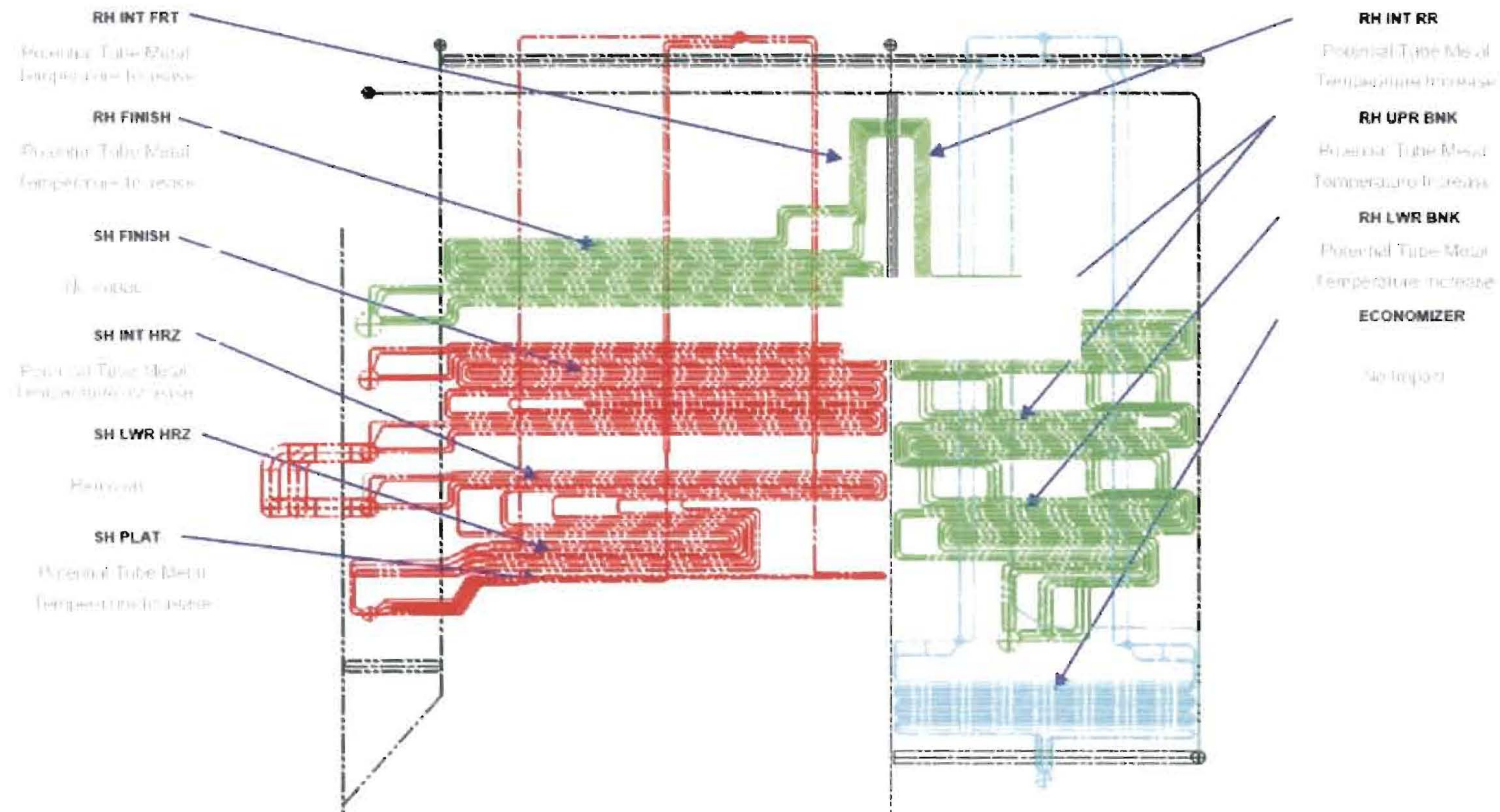


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Appendix B

Ancote Gas Firing Conversion Impacts





CONFIDENTIAL

**Gas Conversion Project
Phase 1
Final REVISED Confidential Report**

TO

**PROGRESS ENERGY
ANCLOTE STATION**

FOR

**UNITS 1 & 2
(Original C-E Boiler Contract Nos. 3571 & 4770)**

**ENGINEERING STUDY
for
CONVERSION TO 100% NATURAL GAS FIRING**

SUBMITTED BY:

**Alstom Power, Inc. – Thermal Services Sector
Boiler Product Line - U.S. Operations
Windsor, CT**

ENGINEERING STUDY CONTRACT NO. 11070912

March 20, 2012

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**REMAINDER OF DOCUMENT
REDACTED IN ITS ENTIRETY**



A CONFIDENTIAL
REVISED FINAL REPORT TO

**PROGRESS ENERGY
ANCLOTE GENERATING STATION
Unit 2**

(ORIGINAL COMBUSTION ENGINEERING INC. CONTRACT NO. 3571)

FOR

**ENGINEERING EVALUATION TO INCREASE GAS FIRING
CAPABILITY WHILE RETAINING 100% OIL FIRING
CAPABILITY**

SUBMITTED BY:

**ALSTOM POWER, INC.
BOILER RETROFITS GROUP - U.S. OPERATION
Windsor, Connecticut**

**Project No. 011070009
March 25, 2009**

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PEF-120103-EI-00290

**REMAINDER OF DOCUMENT
REDACTED IN ITS ENTIRETY**

Anclore Unit 2 Plant Operating Data (5 pages)

**REMAINDER OF DOCUMENT
REDACTED IN ITS ENTIRETY**

Estimate Review Summary Form



Anchor Boiler Gas Conversion

Description: This estimate covers the scope to convert Anchor U1 and U2 from fuel oil to fuel gas. Unit 1 is in-service in the Spring of 2013 and Unit 2 follows in the Fall of 2013.

Estimate Requested by:	Resource Planning	Estimate #:	190.4	Award Date:	1-Jan-13
Estimate Preparation Date:	16-Mar-12	Plant:	Anchor	Cnst Mob Date:	1-Jan-13
Estimated by:	Moody	Type of Contract:	Firm Price	Commercial Op Date:	31-Dec-13

Estimate Purpose	Notes
Determination of Feasibility	As a limited amount of engineering has been complete and no quotes have been received for the materials or construction, this estimate should not be used to establish the project baseline.

Escalation
Escalated to CO date: Dec-13

Estimate Basis:	Notes
Technology identified, Site identified, Prelim engineering not complete.	

Estimate Class (AACE):
Class 4- Study Feasibility (L: -15% to -30% / H: +20% to +50%)

Major Assumptions / Clarifications:

- No significant engineering has been performed and site specific characteristics have not been fully analyzed.
- Both units are converted under a single lump sum construction contract under a single mobilization with separate In-Service dates.
- Includes the cost of upgrades to the M&R station.
- Includes the gas line from the M&R station to the units.
- Includes the DCS upgrades for the burner scope only.
- BMS is 2003 vintage, includes a BMS Logic Review (Outside) and internal Programming.
- Excludes Flue Gas Recirculation for NOX control purposes.
- Includes flushing and demolition of the existing fuel oil supply and return piping from the existing fuel oil burners to the fuel oil booster house.
- Excludes demolition of any fuel oil infrastructure from and including the Fuel Oil Booster pumps, Fuel Oil Storage Tanks, Fuel Oil transmission line and associated infrastructure such as heat tracing.
- Excludes modifications to the existing gas burners EXCEPT for changing the existing light oil igniters to gas igniters.
- This estimate assumes that the units will be converted to 100% gas; co-firing is excluded.
- The impact on the relocation of any underground utilities or other interferences is undetermined. No allowance is included for the relocation of underground utilities or other underground mitigations.
- Chemical cleaning of the SH tubes (if required) is performed by the vendor prior to shipment.
- Hydro cleaning of the SH tubes is not required. During startup, screens are used to catch any debris before entering the STG.
- The new fuel gas burners will be installed at different elevations than where the existing fuel oil burners are currently located.
- AFUDC is allowable. The threshold for AFUDC at the time of the estimate is \$66.5M.
- Excludes any fan work (FD Fans only - not balanced draft).
- Excludes the remediation and disposal of hazardous waste such as contaminated soil.
- Includes disposal of the demolished pipe in a hazardous materials landfill.
- The Plant will remove all #6 Fuel Oil Alarms and Light Oil Alarms from the DCS. They will de-terminate the #6 Fuel Oil field points and Light Oil field points no longer used in the Bailey Panel as well. The labor for this is included in the PGN Staffing Plan.
- Excludes NERC-CIP Requirements.

Estimate Breakdown	Min %	Max %	Min \$'s	Most Likely \$'s	Max \$'s
EPC Contract Costs	-25%	20%	\$ 20,841,647	\$ 27,788,863	\$ 33,346,636
Progress Energy Provided Procurement Costs	-25%	20%	\$ 23,055,568	\$ 30,740,757	\$ 36,888,909
Progress Energy Labor Costs	-15%	20%	\$ 1,752,523	\$ 2,061,792	\$ 2,474,150
Progress Energy Indirect Material Costs	-25%	25%	\$ 2,648,889	\$ 3,531,852	\$ 4,414,815
Total Project Cost Validity Range			\$ 48,298,627	\$ 64,123,264	\$ 77,124,509
Progress Energy Contingency - Estimate Uncertainty			\$ -	\$ 5,666,879	\$ -
Progress Energy Contingency - Risk Register			\$ -	\$ 3,400,000	\$ 3,400,000
Progress Energy Escalation			\$ -	\$ 915,222	\$ -
Total (Project View)			\$ 48,298,627	\$ 74,105,366	\$ 80,524,509
Total Fin View Adder - 55% PGN Labor			\$ 624,247	\$ 734,409	\$ 918,011
Financial View Total			\$ 48,922,874	\$ 74,839,774	\$ 81,442,520
Estimated AFUDC			\$ -	\$ 4,145,109	\$ 5,800,000
Grand Total (Fin View) including AFUDC			\$ 48,922,874	\$ 78,984,883	\$ 87,242,520

Department Review & Approval

Technical:

Name _____ Date _____

Management:

Jeff Moody _____ Date _____

Leigh Formanek _____ Date _____

Commercial:

Name _____ Date _____

Joel Rutledge _____ Date _____

Joel Moran _____ Date _____

Tom Cornell _____ Date _____

Construction / Procurement / Other:

Name _____ Date _____

_____ Date _____

Name _____ Date _____

_____ Date _____

Estimate Review Summary Form



Anclote Boiler Gas Conversion

Description: This estimate covers the scope to convert Anclote U1 and U2 from fuel oil to fuel gas. Unit 1 is in-service in the Spring of 2013 and Unit 2 follows in the Fall of 2013.

Estimate Requested by: Resource Planning Estimate #: 190.4 Award Date: 1-Jan-13
 Estimate Preparation Date: 16-Mar-12 Plant: Anclote Cnst Mob Date: 1-Jan-13
 Estimated by: Moody Type of Contract: Firm Price Commercial Op Date: 31-Dec-13

Estimate Purpose	Notes
Determination of Feasibility	As a limited amount of engineering has been complete and no quotes have been received for the materials or construction, this estimate should not be used to establish the project baseline.

Escalation
Escalated to CO date: Dec-13

Estimate Basis:	Notes
Technology Identified, Site Identified, Prelim engineering not complete.	

Estimate Class (AACE):
Class 4- Study Feasibility (L: -15% to -30% / H: +20% to +50%)

Major Assumptions / Clarifications:

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- Includes the gas line from the M&R station to the units.
- Includes the DCS upgrades for the burner scope only.
- BMS is 2003 vintage, includes a BMS Logic Review (Outside) and internal Programming.
- Excludes Flue Gas Recirculation for NOX control purposes.
- Includes flushing and demolition of the existing fuel oil supply and return piping from the existing fuel oil burners to the fuel oil booster house.
- Excludes demolition of any fuel oil infrastructure from and including the Fuel Oil Booster pumps, Fuel Oil Storage Tanks, Fuel Oil transmission line and associated infrastructure such as heat tracing.
- Excludes modifications to the existing gas burners EXCEPT for changing the existing light oil igniters to gas igniters.
- This estimate assumes that the units will be converted to 100% gas; co-firing is excluded.
- The impact on the relocation of any underground utilities or other interferences is undetermined. No allowance is included for the relocation of underground utilities or other underground mitigations.
- Chemical cleaning of the SH tubes (if required) is performed by the vendor prior to shipment.
- Hydro cleaning of the SH tubes is not required. During startup, screens are used to catch any debris before entering the STG.
- The new fuel gas burners will be installed at different elevations than where the existing fuel oil burners are currently located.
- AFUDC is allowable. The threshold for AFUDC at the time of the estimate is \$66.5M.
- Excludes any fan work (FD Fans only - not balanced draft).
- Excludes the remediation and disposal of hazardous waste such as contaminated soil.
- Includes disposal of the demolished pipe in a hazardous materials landfill.
- The Plant will remove all #6 Fuel Oil Alarms and Light Oil Alarms from the DCS. They will de-terminate the #6 Fuel Oil field points and Light Oil field points no longer used in the Bailey Panel as well. The labor for this is included in the PGN Staffing Plan.
- Excludes NERC-CIP Requirements.

Estimate Breakdown	Min %	Max %	Min \$'s	Most Likely \$'s	Max \$'s
EPC Contract Costs	-25%	20%	\$ 20,841,647	\$ 27,788,863	\$ 33,346,636
Progress Energy Provided Procurement Costs	-25%	20%	\$ 23,055,568	\$ 30,740,757	\$ 36,888,909
Progress Energy Labor Costs	-15%	20%	\$ 1,752,523	\$ 2,061,792	\$ 2,474,150
Progress Energy Indirect Material Costs	-25%	25%	\$ 2,648,889	\$ 3,531,852	\$ 4,414,815
Total Project Cost Validity Range			\$ 48,298,627	\$ 64,123,264	\$ 77,124,509
Progress Energy Contingency - Estimate Uncertainty			\$ -	\$ 5,666,879	\$ -
Progress Energy Contingency - Risk Register			\$ -	\$ 3,400,000	\$ 3,400,000
Progress Energy Escalation			\$ -	\$ 915,222	\$ -
Total (Project View)			\$ 48,298,627	\$ 74,105,366	\$ 80,524,509
Total Fin View Adder - 55% PGN Labor			\$ 624,247	\$ 734,409	\$ 918,011
Financial View Total			\$ 48,922,874	\$ 74,839,774	\$ 81,442,520
Estimated AFUDC			\$ -	\$ 4,145,109	\$ 5,800,000
Grand Total (Fin View) including AFUDC			\$ 48,922,874	\$ 78,984,883	\$ 87,242,520

Department Review & Approval

Technical:

Name _____ Date _____

Commercial:

Name _____ Date _____

Construction / Procurement / Other:

Name _____ Date _____

Name _____ Date _____

Management:

Jeff Moody _____ Date _____

Leigh Formanek _____ Date _____

Joel Rutledge _____ Date _____

Joel Moran _____ Date _____

Tom Cornell _____ Date _____

_____ Date _____

_____ Date _____

_____ Date _____

Anclote Boiler Gas Conversion



Description: This estimate covers the scope to convert Anclote U1 and U2 from fuel oil to fuel gas. Unit 1 is in-service in the Spring of 2013 and Unit 2 follows in the Fall of 2013.

Class	4 - Study or	Region	Florida	PE Proj Kickoff	January-2011
Estimate Range	20% to -25%	Plant	Anclote	EPC Mobilize	January-2013
Type of Contract	Firm Price	Unit	U1 & U2	Unit 1 Outage	March-2013
Estimate #	190.4	Estimate Due	16-Mar-12	Unit 2 Outage	September-2013
Proposal Number	NA	Estimator(s)	Moody	COD	December-2013

Notes & Assumptions

- No significant engineering has been performed and site specific characteristics have not been fully analyzed.
- Both units are converted under a single lump sum construction contract under a single mobilization with separate in-service dates.
- Includes the cost of upgrades to the M&R station.
- Includes the gas line from the M&R station to the units.
- Includes the DCS upgrades for the burner scope only.
- BMS is 2003 vintage. Includes a BMS Logic Review (Outside) and Internal Programming.
- Excludes Flue Gas Recirculation for NOX control purposes.
- Includes flushing and demolition of the existing fuel oil supply and return piping from the existing fuel oil burners to the fuel oil booster house.
- Excludes demolition of any fuel oil infrastructure from and including the Fuel Oil Booster pumps, Fuel Oil Storage Tanks, Fuel Oil transmission line and associated infrastructure such as neat tracing.
- Excludes modifications to the existing gas burners EXCEPT for changing the existing light oil igniters to gas igniters.
- This estimate assumes that the units will be converted to 100% gas; co-firing is excluded.
- The impact on the relocation of any underground utilities or other interferences is undetermined. No allowance is included for the relocation of underground utilities or other underground mitigations.
- Chemical cleaning of the SH tubes (if required) is performed by the vendor prior to shipment.
- Hydro cleaning of the SH tubes is not required. During startup, screens are used to catch any debris before entering the STG.
- The new fuel gas burners will be installed at different elevations than where the existing fuel oil burners are currently located.
- AFUDC is allowable. The threshold for AFUDC at the time of the estimate is \$66.5M.
- Excludes any fan work (FD Fans only - not balanced draft).
- Excludes the remediation and disposal of hazardous waste such as contaminated soil.
- Includes disposal of the demolished pipe in a hazardous materials landfill.
- The Plant will remove all #6 Fuel Oil Alarms and Light Oil Alarms from the DCS. They will de-terminate the #6 Fuel Oil field points and Light Oil field points no longer used in the Bailey Panel as well. The labor for this is included in the PGN Staffing Plan.
- Excludes NERC-CIP Requirements.
- Excludes Fuel Gas cost for startup.

Total Project Estimate Summary

	Total Value	
EPC Contractor		
EPC Contractor Direct & Indirect Cost	\$ 21,492,692	29%
EPC Contractor Contingency	\$ 1,719,415	2%
EPC Contractor Escalation	\$ 952,121	1%
EPC Contractor OH&P	\$ 3,624,634	5%
TOTAL EPC CONTRACT	\$ 27,788,863	37%
Owners Costs		
Progress Energy Direct & Indirect Cost	\$ 36,334,401	49%
Progress Energy Contingency	\$ 9,065,879	12%
Progress Energy Escalation	\$ 915,222	1%
TOTAL OWNER COST	\$ 46,316,502	62%
Total Project Costs	\$ 74,105,366	99%
Total Fin View - 55% PGN Labor	\$ 74,839,774	100%

EPC Cost

Description	Qty's	U / M	Avg MH / UM	PF	Total MH's	Labor \$'s	\$/UM	Material / Expense \$'s	Subcontract \$'s	Total \$'s Cost	% of Project Cost
Division 0 - Demo / Civil / Sitework											
Excavation/backfill for Fuel Gas Line	-	CY	0.4	1.0	-	\$	-	\$	-	\$	0.0%
Demo/ Remove Existing Light Oil Igniters - U2	8	EA	20.0	1.0	160	\$ 8,207	\$	-	\$	\$ 8,207	0.0%
Demo/ Remove Existing Light Oil Igniters - U1	8	EA	20.0	1.0	160	\$ 8,207	\$	-	\$	\$ 8,207	0.0%
	-	LS	1.0	1.0	-	\$	-	\$	-	\$	0.0%
	-	LS	1.0	1.0	-	\$	-	\$	-	\$	0.0%
Existing Fuel Oil Piping - Unit 2	1,423	LF	1.0	1.0	1,423	\$ 72,991	\$ 25	\$ 35,575	\$	\$ 108,566	0.1%
Flush Fuel Oil from Pipe	3	EA	0.76	1.0	2	\$ 117	\$	-	\$	\$ 117	0.0%
Saw Cut Pipe - 8" CS Sch 40	9	EA	0.60	1.0	5	\$ 277	\$	-	\$	\$ 277	0.0%
Saw Cut Pipe - 4" CS Sch 40	30	EA	0.43	1.0	13	\$ 662	\$	-	\$	\$ 662	0.0%
Saw Cut Pipe - 2.5" CS Sch 40	90	EA	0.30	1.0	27	\$ 1,385	\$	-	\$	\$ 1,385	0.0%
Saw Cut Pipe - 1.5" CS Sch 40	60	EA	0.25	1.0	15	\$ 769	\$	-	\$	\$ 769	0.0%
Remove Pipe & Dispose - 8" CS Sch 40	42	LF	0.70	0.5	15	\$ 754	\$ 50	\$ 2,100	\$	\$ 2,854	0.0%
Remove Pipe & Dispose - 6" CS Sch 40	97	LF	0.60	0.5	29	\$ 1,493	\$ 50	\$ 4,850	\$	\$ 6,343	0.0%
Remove Pipe & Dispose - 4" CS Sch 40	409	LF	0.50	0.5	102	\$ 5,245	\$ 50	\$ 20,450	\$	\$ 25,695	0.0%
Remove Pipe & Dispose - 2.5" CS Sch 40	595	LF	0.35	0.5	104	\$ 5,341	\$ 50	\$ 29,750	\$	\$ 35,091	0.0%
Remove Pipe & Dispose - 1.5" CS Sch 40	280	LF	0.30	0.5	42	\$ 2,154	\$ 50	\$ 14,000	\$	\$ 16,154	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS BG - Excavate/backfill - AIP	-	CY	0.5	1.0	-	\$	-	\$	-	\$	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS BG - Saw Cut & Cap - AIP	4	EA	0.8	1.0	3	\$ 156	\$	-	\$	\$ 156	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS BG - Remove & Dispose	720	LF	0.7	0.5	252	\$ 12,976	\$ 50	\$ 36,000	\$	\$ 48,926	0.1%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS AG Elev 0 -Elev 95 - Saw Cut	10	EA	0.8	1.0	8	\$ 410	\$	-	\$	\$ 410	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS AG Elev 0 -Elev 95 - Remove & Dispose	95	LF	0.7	0.5	33	\$ 1,706	\$ 50	\$ 4,750	\$	\$ 6,456	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS BG - Excavate/backfill	100	CY	0.5	1.0	45	\$ 2,308	\$	-	\$	\$ 2,308	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS BG - Saw Cut	57	EA	0.8	1.0	43	\$ 2,222	\$	-	\$	\$ 2,222	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS BG - Remove & Dispose	570	LF	0.7	0.5	200	\$ 10,233	\$ 50	\$ 28,500	\$	\$ 38,733	0.1%
Fuel Oil Return Line - Booster house to Boiler - 8" CS AG Elev 0 -Elev 95 - Saw Cut	10	EA	0.8	1.0	8	\$ 410	\$	-	\$	\$ 410	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS AG Elev 0 -Elev 95 - Remove & Dispose	95	LF	0.7	0.5	33	\$ 1,706	\$ 50	\$ 4,750	\$	\$ 6,456	0.0%
	-	LS	1.0	1.0	-	\$	-	\$	-	\$	0.0%
Electrical Heat Trace and Insulation Removal/ Disposal	5,624	LF	0.2	1.0	1,125	\$ 57,693	\$	-	\$	\$ 57,693	0.1%
Lead & Asbestos Abatement Allowance	1	EA	1.0	1.0	-	\$	-	\$	\$ 125,000	\$ 125,000	0.2%
	-	LS	1.0	1.0	-	\$	-	\$	-	\$	0.0%
Fuel Oil Burners & Igniters Removal (5 levels, 4 burners & igniters/ Level)	40	EA	80.0	1.0	3,200	\$ 164,139	\$	-	\$	\$ 164,139	0.2%
	-	LS	1.0	1.0	-	\$	-	\$	-	\$	0.0%
	-	LS	1.0	1.0	-	\$	-	\$	-	\$	0.0%
	-	LS	1.0	1.0	-	\$	-	\$	-	\$	0.0%
Existing Fuel Oil Piping - Unit 1	1,423	LF	1.0	1.0	1,423	\$ 72,991	\$ 25	\$ 35,575	\$	\$ 108,566	0.1%
Flush Fuel Oil from Pipe	3	EA	0.76	1.0	2	\$ 117	\$	-	\$	\$ 117	0.0%
Saw Cut Pipe - 8" CS Sch 40	9	EA	0.60	1.0	5	\$ 277	\$	-	\$	\$ 277	0.0%
Saw Cut Pipe - 4" CS Sch 40	30	EA	0.43	1.0	13	\$ 662	\$	-	\$	\$ 662	0.0%
Saw Cut Pipe - 2.5" CS Sch 40	90	EA	0.30	1.0	27	\$ 1,385	\$	-	\$	\$ 1,385	0.0%
Saw Cut Pipe - 1.5" CS Sch 40	60	EA	0.25	1.0	15	\$ 769	\$	-	\$	\$ 769	0.0%
Remove Pipe & Dispose - 8" CS Sch 40	42	LF	0.70	0.5	15	\$ 754	\$ 50	\$ 2,100	\$	\$ 2,854	0.0%
Remove Pipe & Dispose - 6" CS Sch 40	97	LF	0.60	0.5	29	\$ 1,493	\$ 50	\$ 4,850	\$	\$ 6,343	0.0%
Remove Pipe & Dispose - 4" CS Sch 40	409	LF	0.50	0.5	102	\$ 5,245	\$ 50	\$ 20,450	\$	\$ 25,695	0.0%
Remove Pipe & Dispose - 2.5" CS Sch 40	595	LF	0.35	0.5	104	\$ 5,341	\$ 50	\$ 29,750	\$	\$ 35,091	0.0%
Remove Pipe & Dispose - 1.5" CS Sch 40	280	LF	0.30	0.5	42	\$ 2,154	\$ 50	\$ 14,000	\$	\$ 16,154	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS BG - Excavate/backfill - AIP	-	CY	0.5	1.0	-	\$	-	\$	-	\$	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS BG - Saw Cut & Cap - AIP	4	EA	0.8	1.0	3	\$ 156	\$	-	\$	\$ 156	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS BG - Remove & Dispose	570	LF	0.7	0.5	200	\$ 10,233	\$ 50	\$ 28,500	\$	\$ 38,733	0.1%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS AG Elev 0 -Elev 95 - Saw Cut	10	EA	0.8	1.0	8	\$ 410	\$	-	\$	\$ 410	0.0%
Fuel Oil Supply Line - Booster house to Boiler - 8" CS AG Elev 0 -Elev 95 - Remove & Dispose	95	LF	0.7	0.5	33	\$ 1,706	\$ 50	\$ 4,750	\$	\$ 6,456	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS BG - Excavate/backfill	100	CY	0.5	1.0	45	\$ 2,308	\$	-	\$	\$ 2,308	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS BG - Saw Cut	57	EA	0.8	1.0	43	\$ 2,222	\$	-	\$	\$ 2,222	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS BG - Remove & Dispose	570	LF	0.7	0.5	200	\$ 10,233	\$ 50	\$ 28,500	\$	\$ 38,733	0.1%

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Description	Qty's	U / M	Avg MH / UM	PF	Total MH's	Labor \$'s	\$/UM	Material / Expense \$'s	Subcontract \$'s	Total \$'s Cost	% of Project Cost
Fuel Oil Return Line - Booster house to Boiler - 8" CS AG Elev 0 - Elev 95 - Saw Cut	10	EA	0.8	1.0	8	\$ 410	\$ -	\$ -	\$ -	\$ 410	0.0%
Fuel Oil Return Line - Booster house to Boiler - 8" CS AG Elev 0 - Elev 95 - Remove & Dispose	95	LF	0.7	0.5	33	\$ 1,708	\$ 50	\$ 4,750	\$ -	\$ 6,456	0.0%
Electrical Heat Trace and Insulation Removal/ Disposal	5,429	LF	0.2	1.0	1,086	\$ 55,692	\$ -	\$ -	\$ -	\$ 55,692	0.1%
Lead & Asbestos Abatement Allowance	1	EA	1.0	1.0	-	\$ -	\$ -	\$ -	\$ 125,000	\$ 125,000	0.2%
Fuel Oil Burners & Ignitors Removal (5 levels, 4 burners & Ignitors/ Level)	40	EA	80.0	1.0	3,200	\$ 164,139	\$ -	\$ -	\$ -	\$ 164,139	0.2%
	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Total: Division 0- Demo / Civil / Sitework	-	CY	-	-	13,684	\$ 701,912	\$ -	\$ 353,950	\$ 250,000	\$ 1,305,862	2%
Division 1- Concrete											
Pipe Footers, Heat Exchanger Pad	10	LS	250.0	1.0	250	\$ 12,823	\$ 2,500	\$ 2,500	\$ -	\$ 15,323	0.0%
	-	LS	-	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Total: Division 1- Concrete	-	CY	-	-	250	\$ 12,823	\$ -	\$ 2,500	\$ -	\$ 15,323	0%
Division 2- Structural Steel / Buildings / Arch & Metals											
Misc Supports and Platform Mods	10	LS	-	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
	-	TNS	25.0	1.2	300	\$ 15,368	\$ 3,200	\$ 32,000	\$ -	\$ 47,368	0.1%
	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Unit 2											
Repair Boiler Penetrations for Removed FO Burners and Ignito	40	EA	20.0	1.0	800	\$ 41,035	\$ 1,000	\$ 40,000	\$ -	\$ 81,035	0.1%
	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Unit 1											
Repair Boiler Penetrations for Removed FO Burners and Ignito	40	EA	20.0	1.0	800	\$ 41,035	\$ 1,000	\$ 40,000	\$ -	\$ 81,035	0.1%
	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
	-	LS	1.0	1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Total: Division 2- Structural Steel / Buildings / Arch & Metals	10	TNS	190.0	-	1,900	\$ 97,458	\$ -	\$ 112,000	\$ -	\$ 209,458	0%
Division 3- Piping											
Unit 2											
Isolate and purge 8" Gas Line	1	LS	50.00	1.20	60	\$ 3,078	\$ -	\$ -	\$ -	\$ 3,078	0.0%
Cut 8" Header and install 8"X8"X6" Reducing Tee	4	EA	10.00	1.20	48	\$ 2,462	\$ 110.00	\$ 440	\$ -	\$ 2,902	0.0%
6" CS pipe - 90deg elbows	4	EA	6.00	1.20	29	\$ 1,477	\$ 110.00	\$ 440	\$ -	\$ 1,917	0.0%
6" CS pipe -	12	LF	4.00	1.20	58	\$ 2,955	\$ 65.00	\$ 780	\$ -	\$ 3,735	0.0%
6" Isolation Valve	4	EA	20.00	1.20	96	\$ 4,924	\$ 9,000.00	\$ 36,000	\$ -	\$ 40,924	0.1%
	-	LS	1.20	1.20	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
12" pipe sch 80, carbon steel	450	LF	6.00	1.20	3,240	\$ 166,191	\$ -	\$ -	\$ -	\$ 166,191	0.2%
6" pipe sch 80, carbon steel	450	LF	4.00	1.20	2,160	\$ 110,794	\$ -	\$ -	\$ -	\$ 110,794	0.1%
2 1/2" pipe sch 80, carbon steel (vent pipe)	900	LF	2.00	1.20	2,160	\$ 110,794	\$ -	\$ -	\$ -	\$ 110,794	0.1%
Pipe Supports	225	EA	5.00	1.20	1,350	\$ 69,246	\$ 225.00	\$ 50,625	\$ -	\$ 119,871	0.2%
Cut 4" header and install 2.5"X4"X4" Reducing Tee	12	EA	8.00	1.20	115	\$ 5,909	\$ 110.00	\$ 1,320	\$ -	\$ 7,229	0.0%
	-	LS	1.00	1.00	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Corner Valves 2 per corner	24	EA	16.00	1.20	461	\$ 23,636	\$ -	\$ -	\$ -	\$ 23,636	0.0%
Corner Bleed 1 per corner	12	EA	8.00	1.20	115	\$ 5,909	\$ -	\$ -	\$ -	\$ 5,909	0.0%
Corner manual isolation valve	12	EA	16.00	1.20	230	\$ 11,818	\$ -	\$ -	\$ -	\$ 11,818	0.0%
Header manual isolation Valve	2	EA	24.00	1.20	58	\$ 2,955	\$ -	\$ -	\$ -	\$ 2,955	0.0%
Header Gas Control Valve	1	EA	20.00	1.20	24	\$ 1,231	\$ -	\$ -	\$ -	\$ 1,231	0.0%
Isolation Trip Valve Gas Header	1	EA	20.00	1.20	24	\$ 1,231	\$ -	\$ -	\$ -	\$ 1,231	0.0%
Miscellaneous Valves	36	EA	16.00	1.20	691	\$ 35,454	\$ -	\$ -	\$ -	\$ 35,454	0.0%
	-	LS	1.20	1.20	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Unit 1											
Isolate and purge 8" Gas Line	1	LS	50.00	1.20	60	\$ 3,078	\$ -	\$ -	\$ -	\$ 3,078	0.0%
Cut 8" Header and install 8"X8"X6" Reducing Tee	4	EA	10.00	1.20	48	\$ 2,462	\$ 110.00	\$ 440	\$ -	\$ 2,902	0.0%
6" CS pipe - 90deg elbows	4	EA	6.00	1.20	29	\$ 1,477	\$ 110.00	\$ 440	\$ -	\$ 1,917	0.0%
6" CS pipe -	12	LF	4.00	1.20	58	\$ 2,955	\$ 65.00	\$ 780	\$ -	\$ 3,735	0.0%
6" Isolation Valve	4	EA	20.00	1.20	96	\$ 4,924	\$ 9,000.00	\$ 36,000	\$ -	\$ 40,924	0.1%
	-	LS	1.20	1.20	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
12" pipe sch 80, carbon steel	450	LF	6.00	1.20	3,240	\$ 166,191	\$ -	\$ -	\$ -	\$ 166,191	0.2%
6" pipe sch 80, carbon steel	450	LF	4.00	1.20	2,160	\$ 110,794	\$ -	\$ -	\$ -	\$ 110,794	0.1%
2 1/2" pipe sch 80, carbon steel (vent pipe)	900	LF	2.00	1.20	2,160	\$ 110,794	\$ -	\$ -	\$ -	\$ 110,794	0.1%
Pipe Supports	225	EA	5.00	1.20	1,350	\$ 69,246	\$ 225.00	\$ 50,625	\$ -	\$ 119,871	0.2%
Cut 4" header and install 2.5"X4"X4" Reducing Tee	12	EA	8.00	1.20	115	\$ 5,909	\$ 110.00	\$ 1,320	\$ -	\$ 7,229	0.0%
	-	LS	1.00	1.00	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Corner Valves 2 per corner	24	EA	16.00	1.20	461	\$ 23,636	\$ -	\$ -	\$ -	\$ 23,636	0.0%
Corner Bleed 1 per corner	12	EA	8.00	1.20	115	\$ 5,909	\$ -	\$ -	\$ -	\$ 5,909	0.0%
Corner manual isolation valve	12	EA	16.00	1.20	230	\$ 11,818	\$ -	\$ -	\$ -	\$ 11,818	0.0%
Header manual isolation Valve	2	EA	24.00	1.20	58	\$ 2,955	\$ -	\$ -	\$ -	\$ 2,955	0.0%
Header Gas Control Valve	1	EA	20.00	1.20	24	\$ 1,231	\$ -	\$ -	\$ -	\$ 1,231	0.0%
Isolation Trip Valve Gas Header	1	EA	20.00	1.20	24	\$ 1,231	\$ -	\$ -	\$ -	\$ 1,231	0.0%
Miscellaneous Valves	36	EA	16.00	1.20	691	\$ 35,454	\$ -	\$ -	\$ -	\$ 35,454	0.0%
	-	LS	1.20	1.20	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Common - Gas Line from M&R Station to Units											
From M&R to the unit - 24" BG, CS											
Reducing Tee 24" to 12"											
4" CS AG - Steam pipe for FG Heat Exchangers											
		LS	1.00	1.00	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		LS	1.00	1.00	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		LS	1.00	1.00	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		LS	1.00	1.00	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		LF	1.00	1.00	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Total: Division 3- Piping	5,424	LF	5.20	1.00	28,226	\$ 1,447,891	\$ -	\$ 447,800	\$ -	\$ 1,895,691	3%

1
2
3

Description	Qty's	U / M	Avg MH / UM	PF	Total MH's	Labor \$'s	\$/UM	Material / Expense \$'s	Subcontract \$'s	Total \$'s Cost	% of Project Cost
Division 4- Equipment											
Unit 2		LS	-								
Flame Scanners	20	EA	4.00	1.20	96	\$ 4,924	\$ -	\$ -	\$ -	\$ 4,924	0.0%
Gas Igniters - replace current diesel ignitors with gas	20	EA	80.0	1.20	1,920	\$ 98,483	\$ -	\$ -	\$ -	\$ 98,483	0.1%
Burner Installation - Supplied by Owner	12	EA	200.00	1.20	2,880	\$ 147,725	\$ -	\$ -	\$ -	\$ 147,725	0.2%
		LS		1.20	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
LTSH and SH Horizontal Section Replacement (Labor is factored from the equipment price)	1	LS	50,000.0	1.0	50,000	\$ 2,564,672	\$ -	\$ -	\$ -	\$ 2,564,672	3.4%
Lower SH Header Replacement	1	LS	20,000.0	1.0	20,000	\$ 1,025,869	\$ -	\$ -	\$ -	\$ 1,025,869	1.4%
				1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Cost for Boiler repairs as found through the assessment - See Risk Register	-	LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
				1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Unit 1		EA		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Flame Scanners	20	EA	4.00	1.20	96	\$ 4,924	\$ -	\$ -	\$ -	\$ 4,924	0.0%
Gas Igniters - replace current diesel ignitors with gas	20	EA	80.0	1.20	1,920	\$ 98,483	\$ -	\$ -	\$ -	\$ 98,483	0.1%
Burner Installation - Supplied by Owner	12	EA	200.00	1.20	2,880	\$ 147,725	\$ -	\$ -	\$ -	\$ 147,725	0.2%
		LS		1.20	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
LTSH and SH Horizontal Section Replacement (Labor is factored from the equipment price)	1	LS	50,000.0	1.0	50,000	\$ 2,564,672	\$ -	\$ -	\$ -	\$ 2,564,672	3.4%
Lower SH Header Replacement	1	LS	20,000.0	1.0	20,000	\$ 1,025,869	\$ -	\$ -	\$ -	\$ 1,025,869	1.4%
				1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Cost for Boiler repairs as found through the assessment - See Risk Register	-	LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
				1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Common											
Fire Protection Modifications	1	LS		1.0	-	\$ -	\$ -	\$ -	\$ 250,000	\$ 250,000	0.3%
Cathodic Protection	1	LS		1.0	-	\$ -	\$ -	\$ -	\$ 25,000	\$ 25,000	0.0%
Fuel Gas Heat Exchanger	2	EA	250.0	1.0	500	\$ 25,647	\$ -	\$ -	\$ -	\$ 25,647	0.0%
		EA		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Total: Division 4- Equipment	1	LS	150,292.0	1.0	150,292	\$ 7,708,994	\$ -	\$ -	\$ 275,000.00	\$ 7,983,994	11%
Division 5- Electrical											
Unit 2		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Control Wire incs terminations	10,000	LF	0.03	1.20	360	\$ 18,466	\$ 3.00	\$ 30,000	\$ -	\$ 48,466	0.1%
Power cable incs terminations	1,500	LF	0.04	1.20	72	\$ 3,693	\$ 5.00	\$ 7,500	\$ -	\$ 11,193	0.0%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Cable Tray - 12", ladder bottom, no covers	500	LF	1.50	1.20	900	\$ 46,164	\$ 45.00	\$ 22,500	\$ -	\$ 68,664	0.1%
Conduit - AG, 2"	5,000	LF	0.42	1.20	2,520	\$ 129,259	\$ 11.00	\$ 55,000	\$ -	\$ 184,259	0.2%
											0.0%
Unit 1		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Control Wire incs terminations	10,000	LF	0.03	1.20	360	\$ 18,466	\$ 3.00	\$ 30,000	\$ -	\$ 48,466	0.1%
Power cable incs terminations	1,500	LF	0.04	1.20	72	\$ 3,693	\$ 5.00	\$ 7,500	\$ -	\$ 11,193	0.0%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Cable Tray - 12", ladder bottom, no covers	500	LF	1.50	1.20	900	\$ 46,164	\$ 45.00	\$ 22,500	\$ -	\$ 68,664	0.1%
Conduit - AG, 2"	5,000	LF	0.42	1.20	2,520	\$ 129,259	\$ 11.00	\$ 55,000	\$ -	\$ 184,259	0.2%
											0.0%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Total: Division 5- Electrical	23,000	LF	0.33	1.0	7,704	\$ 395,165	\$ -	\$ 230,000	\$ -	\$ 625,165	1%
Division 6- Instrumentation / Controls											
Unit 2		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Header Flow Transmitter FT	1	EA	4.00	1.20	5	\$ 246	\$ -	\$ -	\$ -	\$ 246	0.0%
Pressure Transmitter (PT)	6	EA	4.00	1.20	29	\$ 1,477	\$ -	\$ -	\$ -	\$ 1,477	0.0%
Temperature Transmitter (TT)	3	EA	4.00	1.20	14	\$ 739	\$ -	\$ -	\$ -	\$ 739	0.0%
Pressure Indicator (PI)	6	EA	3.00	1.20	22	\$ 1,108	\$ -	\$ -	\$ -	\$ 1,108	0.0%
Pressure Switch High, PSH use PT	6	EA	4.00	1.20	29	\$ 1,477	\$ -	\$ -	\$ -	\$ 1,477	0.0%
Pressure Switch Low, PSL use PT	3	EA	4.00	1.20	14	\$ 739	\$ -	\$ -	\$ -	\$ 739	0.0%
Air Regulators for on-off valves	15	EA	3.00	1.20	54	\$ 2,770	\$ -	\$ -	\$ -	\$ 2,770	0.0%
Upstream Windbox Pressure Sensors	8	EA	6.00	1.20	56	\$ 2,955	\$ -	\$ -	\$ -	\$ 2,955	0.0%
Airflow Measurement System - Supplied by AMC (44 windbox, 2 CAMM in NEMA 4 enc.) - Downstream Sensors	1	LS	320.00	1.20	384	\$ 19,697	\$ -	\$ -	\$ -	\$ 19,697	0.0%
3/8" SS Tubing (incl fittings)	4,000	LF	0.15	1.20	720	\$ 36,931	\$ 2.16	\$ 8,640	\$ -	\$ 45,571	0.1%
											0.0%
I/O Cabinets (Owner Furnished)	1	EA	4,000.00	1.20	4,800	\$ 246,209	\$ -	\$ -	\$ -	\$ 246,209	0.3%
Communications Equipment (Owner Furnished)	1	LS	4,000.00	1.20	4,800	\$ 246,209	\$ -	\$ -	\$ -	\$ 246,209	0.3%
											0.0%
Unit 1		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Header Flow Transmitter FT	1	EA	4.00	1.20	5	\$ 246	\$ -	\$ -	\$ -	\$ 246	0.0%
Pressure Transmitter (PT)	6	EA	4.00	1.20	29	\$ 1,477	\$ -	\$ -	\$ -	\$ 1,477	0.0%
Temperature Transmitter (TT)	3	EA	4.00	1.20	14	\$ 739	\$ -	\$ -	\$ -	\$ 739	0.0%
Pressure Indicator (PI)	6	EA	3.00	1.20	22	\$ 1,108	\$ -	\$ -	\$ -	\$ 1,108	0.0%
Pressure Switch High, PSH use PT	6	EA	4.00	1.20	29	\$ 1,477	\$ -	\$ -	\$ -	\$ 1,477	0.0%
Pressure Switch Low, PSL use PT	3	EA	4.00	1.20	14	\$ 739	\$ -	\$ -	\$ -	\$ 739	0.0%
Air Regulators for on-off valves	15	EA	3.00	1.20	54	\$ 2,770	\$ -	\$ -	\$ -	\$ 2,770	0.0%
Upstream Windbox Pressure Sensors	8	EA	6.00	1.20	56	\$ 2,955	\$ -	\$ -	\$ -	\$ 2,955	0.0%
Airflow Measurement System - Supplied by AMC (44 windbox, 2 CAMM in NEMA 4 enc.) - Downstream Sensors	1	LS	320.00	1.20	384	\$ 19,697	\$ -	\$ -	\$ -	\$ 19,697	0.0%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
3/8" SS Tubing (incl fittings)	4,000	LF	0.15	1.20	720	\$ 36,931	\$ 2.16	\$ 8,640	\$ -	\$ 45,571	0.1%
											0.0%
I/O Cabinets (Owner Furnished)	1	EA	4,000.00	1.20	4,800	\$ 246,209	\$ -	\$ -	\$ -	\$ 246,209	0.3%
Communications Equipment (Owner Furnished)	1	LS	4,000.00	1.20	4,800	\$ 246,209	\$ -	\$ -	\$ -	\$ 246,209	0.3%
		LS		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		EA		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		EA		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		EA		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
		EA		1.0	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Total: Division 6- Instrumentation / Controls	98	EA	223.03	1.0	21,857	\$ 1,121,110	\$ -	\$ 17,280	\$ -	\$ 1,138,390	2%

Description	Qty's	U / M	Avg MH / UM	PF	Total MH's	Labor \$'s	\$/UM	Material / Expense \$'s	Subcontract \$'s	Total \$'s Cost	% of Project Cost
Division 7- Insulation / Painting											
Insulation/ Painting Allowance	-	LS	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
	-	LS	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.2%
	-	SF	-	1.0	-	\$ -		\$ -	\$ 175,000.00	\$ 175,000	0.0%
	-	LS	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
	-	SF	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
	-	LS	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
Total: Division 7- Insulation / Painting	-	LF	-	1.0	-	\$ -		\$ -	\$ 175,000	\$ 175,000	0%
CCO- (Contract Change Order Directs)	-	LS	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
Total: CCO- (Contract Change Order Directs)	-	LS	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0%
Total Construction Directs				1.0	223,915	\$ 11,485,363		\$ 1,163,530	\$ 700,000	\$ 13,348,883	18%
Division 8- Construction Indirects											
Safety	1	LS	1.00%	1.0	2,239	\$ 114,854	0.25%	\$ 33,372	\$ -	\$ 148,226	0.2%
Mobilization / Demobilization	1	LS	0.50%	1.0	1,120	\$ 57,427	0.50%	\$ 66,744	\$ -	\$ 124,171	0.2%
Office / Field Overhead Expenses	1	LS	0.00%	1.0	-	\$ -	0.20%	\$ 26,698	\$ -	\$ 26,698	0.0%
Site Services	1	LS	2.00%	1.0	4,478	\$ 229,707	2.00%	\$ 266,978	\$ -	\$ 496,685	0.7%
Additional Demob/ Remob	-	EA	0.00%	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
Equipment - Scaffolding	1	LS	0.00%	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
Equipment (\$ per Direct MH)	1	LS	0.10%	1.0	224	\$ 11,485	7.50	\$ 1,679,360	\$ 450,000	\$ 450,000	0.6%
ST&C (\$ per Direct MH)	1	LS	0.00%	1.0	-	\$ -	5.00	\$ 1,119,573	\$ -	\$ 1,690,845	2.3%
Other (freight, rainout/ standby time)	1	LS	0.25%	1.0	560	\$ 28,713	0.10%	\$ 13,349	\$ -	\$ 42,062	0.1%
Pre-Op Startup & Testing	1	LS	0.50%	1.0	1,120	\$ 57,427	0.00%	\$ -	\$ -	\$ 57,427	0.1%
Other	-	LS	0.00%	1.0	-	\$ -	0.00%	\$ -	\$ -	\$ -	0.0%
Total: Division 8- Construction Indirects	1	LS	9,740.3	1.0	9,740	\$ 499,613		\$ 3,206,074	\$ 450,000	\$ 4,155,687	6%
Construction Management											
Staff Construction Management	1	LS	6.0	1.0	37,319	\$ 2,612,338	\$ 1,175,552	\$ 1,175,552	\$ -	\$ 3,787,889	5.1%
Craft CM	-	Mths	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
Total: Construction Management	1	LS	6.0	1.0	37,319	\$ 2,612,338		\$ 1,175,552	\$ -	\$ 3,787,889	5%
Total Construction Cost	1	LS	9,746.3	1.0	270,974	\$ 14,597,303		\$ 5,545,156	\$ 1,150,000	\$ 21,292,459	28%
Division 9- Home Office Engineering / Indirects											
Engineering / Admin	-	LS	-	1.0	-	\$ -		\$ -	\$ -	\$ -	0.0%
Insurance / Sureties	1	LS	-	1.0	-	\$ -	0.50%	\$ 66,744	\$ -	\$ 66,744	0.1%
Permits / Taxes / Warranty / Other	1	LS	-	1.0	-	\$ -	1.00%	\$ 133,489	\$ -	\$ 133,489	0.2%
Total: Division 9- Home Office Engineering/Indirects	1	LS	-	1.0	-	\$ -		\$ 200,233	\$ -	\$ 200,233	0%
Total Direct & Indirect Cost (Excluding Cont & Esc)	1	LS	270,974.0	1.0	270,974	\$ 14,597,303		\$ 5,745,389	\$ 1,150,000	\$ 21,492,692	29%
Contingency & Escalation											
Contingency	6%	PCT	270,974.0	1.0	21,678	\$ 1,167,784		\$ 459,631	\$ 92,000	\$ 1,719,415	2.3%
Escalation	4%	PCT	-	1.0	-	\$ -		\$ -	\$ 952,121	\$ 952,121	1.3%
Total Contingency & Escalation					21,678	\$ 1,167,784		\$ 459,631	\$ 1,044,121	\$ 2,671,537	4%
Total EPC Cost					292,652	\$ 15,765,087		\$ 6,205,020	\$ 2,194,121	\$ 24,164,229	32%
Contractor OH & P											
Contractor G&A	5.0%	PCT	-	-	-	\$ 788,254.37		\$ 310,251.02	\$ 109,706.06	\$ 1,208,211	1.6%
Contractor Fee	10.0%	PCT	-	-	-	\$ 1,576,508.73		\$ 620,502.03	\$ 219,412.12	\$ 2,416,423	3.2%
Total OH & P						\$ 2,364,763		\$ 930,753	\$ 329,118	\$ 3,624,634	
Total EPC Contractor Contract Value										\$ 27,788,863	37%

CONFIDENTIAL

Description	Qty's	U / M	Avg MH / UM	PF	Total MH's	Labor \$'s	\$/UM	Material / Expense \$'s	Subcontract \$'s	Total \$'s Cost	% of Project Cost
Progress Energy Detail											
Owner Procurements											
Unit 2											
Gas Burner Assembly (Based on Alstom Budgetary Quote)	3	EA	-	-	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Airflow Measurement System	1	EA	-	-	-	\$ -	\$ 555,000	\$ 1,665,000	\$ -	\$ 1,665,000	2.2%
Gas Igniters - 20 Ea, Incids Horn Igniter, Hose, Block & Vent	1	EA	-	-	-	\$ -	\$ 235,400.00	\$ 235,400	\$ -	\$ 235,400	0.3%
Valve Train, Control box	1	LS	-	-	-	\$ -	\$ 474,670	\$ 474,670	\$ -	\$ 474,670	0.6%
Flame Scanners	20	EA	-	-	-	\$ -	\$ 10,000.00	\$ 200,000	\$ -	\$ 200,000	0.3%
Upstream Windbox Pressure Sensors	8	EA	-	-	-	\$ -	\$ 4,500.00	\$ 36,000	\$ -	\$ 36,000	0.0%
Commissioning/Support	3	EA	-	-	-	\$ -	\$ 46,500	\$ 139,501	\$ -	\$ 139,501	0.2%
Freight	1	LS	-	-	-	\$ -	\$ 13,000.00	\$ 13,000	\$ -	\$ 13,000	0.0%
Lower SH Header Replacement	1	LS	-	-	-	\$ -	\$ 150,000	\$ 150,000	\$ -	\$ 150,000	0.2%
LTSH and SH Horizontal Section Materials - Alstom Budgetary quote escalated at 2.4% and 3.1%	1	LS	-	-	-	\$ -	\$ 5,701,018	\$ 5,701,018	\$ -	\$ 5,701,018	7.6%
Additional Superheater Work - Finishing SH	1	LS	-	-	-	\$ -	\$ 1,000,000	\$ 1,000,000	\$ -	\$ 1,000,000	1.3%
DCS Equipment	-	-	-	-	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
I/O Cabinets	1	EA	-	-	-	\$ -	\$ 50,000.00	\$ 50,000	\$ -	\$ 50,000	0.1%
Communications Equipment	1	LS	-	-	-	\$ -	\$ 250,000.00	\$ 250,000	\$ -	\$ 250,000	0.3%
Unit 1	-	-	-	-	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Gas Burner Assembly (Based on Alstom Budgetary Quote)	3	EA	-	-	-	\$ -	\$ 555,000	\$ 1,665,000	\$ -	\$ 1,665,000	2.2%
Airflow Measurement System	1	EA	-	-	-	\$ -	\$ 235,400.00	\$ 235,400	\$ -	\$ 235,400	0.3%
Valve Train, Control box	1	LS	-	-	-	\$ -	\$ 474,670	\$ 474,670	\$ -	\$ 474,670	0.6%
Flame Scanners	20	EA	-	-	-	\$ -	\$ 10,000.00	\$ 200,000	\$ -	\$ 200,000	0.3%
Upstream Windbox Pressure Sensors	8	EA	-	-	-	\$ -	\$ 4,500.00	\$ 36,000	\$ -	\$ 36,000	0.0%
Commissioning/Support	3	EA	-	-	-	\$ -	\$ 46,500	\$ 139,501	\$ -	\$ 139,501	0.2%
Freight	1	LS	-	-	-	\$ -	\$ 13,000.00	\$ 13,000	\$ -	\$ 13,000	0.0%
Lower SH Header Replacement	1	LS	-	-	-	\$ -	\$ 150,000	\$ 150,000	\$ -	\$ 150,000	0.2%
quote escalated at 2.4% and 3.1%	1	LS	-	-	-	\$ -	\$ 5,701,018	\$ 5,701,018	\$ -	\$ 5,701,018	7.6%
Additional Superheater Work - Finishing SH	1	LS	-	-	-	\$ -	\$ 1,000,000	\$ 1,000,000	\$ -	\$ 1,000,000	1.3%
DCS Equipment	-	-	-	-	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
I/O Cabinets	1	EA	-	-	-	\$ -	\$ 50,000.00	\$ 50,000	\$ -	\$ 50,000	0.1%
Communications Equipment	1	LS	-	-	-	\$ -	\$ 250,000.00	\$ 250,000	\$ -	\$ 250,000	0.3%
Common	-	-	-	-	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Fuel Gas Heat Exchanger	2	EA	-	-	-	\$ -	\$ 300,000	\$ 600,000	\$ -	\$ 600,000	0.8%
	-	-	-	-	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
	1	LS	-	-	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
Actual Cost through Feb 29, 2012 - Excludes Alstom	1.00	LS	-	-	-	\$ -	\$ -	\$ -	\$ 111,581	\$ 111,581	0.1%
Total Owner Procurements						\$ -	\$ -	\$ 20,429,176	\$ 10,311,581	\$ 30,740,757	41.1%
Owner Labor & Indirect Cost											
Staff	1.00	LS	30,791	-	30,791	\$ 1,800,242	\$ -	\$ 261,550	\$ -	\$ 2,061,792	2.8%
Indirect	20.00%	PCT	-	-	-	\$ -	\$ 2,061,792	\$ 412,358	\$ -	\$ 412,358	0.6%
BMS Review	1.00	LS	-	-	-	\$ -	\$ -	\$ -	\$ 50,000	\$ 50,000	0.1%
DCS Engineering - Logic & Drawing Updates	1.00	LS	-	-	-	\$ -	\$ -	\$ -	\$ 300,000	\$ 300,000	0.4%
Alstom Power Phase I Contract	1.00	LS	-	-	-	\$ -	\$ 402,750	\$ 402,750	\$ -	\$ 402,750	0.5%
Detail Design Engineering	1.00	LS	-	-	-	\$ -	\$ 1,800,000	\$ 1,800,000	\$ -	\$ 1,800,000	2.4%
Boiler Assessment (per unit)	2.00	EA	-	-	-	\$ -	\$ -	\$ -	\$ 400,000	\$ 400,000	0.5%
Insurance - BAR	0.31%	PCT	-	-	-	\$ -	\$ 11,852,697	\$ 36,743	\$ -	\$ 36,743	0.0%
Startup Materials	-	-	-	-	-	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%
STG Startup Screens - Main Stop Valve U1	1.00	EA	-	-	-	\$ -	\$ 40,000	\$ 40,000	\$ -	\$ 40,000	0.1%
STG Startup Screens - Main Stop Valve U2	1.00	EA	-	-	-	\$ -	\$ 40,000	\$ 40,000	\$ -	\$ 40,000	0.1%
Compressors to Clean Gas Line	1.00	EA	-	-	-	\$ -	\$ 50,000	\$ 50,000	\$ -	\$ 50,000	0.1%
Total Owner Labor & Indirects					30,791	\$ 1,800,242	\$ -	\$ 3,043,402	\$ 750,000	\$ 5,593,643	7.5%
Owner Contingency & Escalation											
Procurement Contingency	10.0%	PCT	-	-	-	\$ -	\$ 30,740,757	\$ 3,074,076	\$ -	\$ 3,074,076	4.1%
Labor & Indirect Cost Contingency	5.0%	PCT	1,540	-	1,540	\$ 90,012	\$ 5,593,643	\$ 279,882	\$ -	\$ 369,894	0.5%
EPC Contract Contingency	8.0%	PCT	-	-	-	\$ -	\$ 27,788,863	\$ 2,223,199	\$ -	\$ 2,223,199	3.0%
Risk Based Contingency - See Risk Register	1.00	LS	-	-	-	\$ -	\$ -	\$ -	\$ 3,400,000	\$ 3,400,000	4.5%
Escalation	2.2%	PCT	-	-	-	\$ -	\$ -	\$ -	\$ 915,222	\$ 915,222	1.2%
Total Contingency & Escalation					1,540	\$ 90,012	\$ -	\$ 5,767,867	\$ 4,315,222	\$ 9,982,102	13.3%
Total Owner Cost					32,331	\$ 1,890,254	\$ -	\$ 29,048,445	\$ 15,376,803	\$ 46,316,602	61.9%
Total Project Cost						\$ 324,983	\$ 20,020,104	\$ 36,185,216	\$ 17,900,043	\$ 74,105,366	99%

Indicators	
Eqpt \$ / Direct MH:	\$9.58
Direct MH / CM MH's:	6.0
Direct MH / indirect MH	23.0
Avg Eng Rt (Burdened)	\$0.00
Avg CM Rt (Burdened)	\$101.50
Craft "All-in Wage Rate"	\$116.83
Eng % of Proj Rev	0.0%
Peak FTE's	
Avg. FTE's	78
Avg Craft Work Week:	50
Days per Week (Non Outp)	5
# Shifts (Non Outp)	1
# Shifts (Outp)	2
Blended Rate	\$29.17
Burden %	33%
Pendium \$ / Wk	\$525.00
Retention \$ / MH	\$2.00
Safety \$ / MH	\$0.00
Total Composite Rate	\$51.29

Estimated Cash Flow							
Year	2011	2012	2013	2014	2015	2016	Total
Capital (Fin View)	\$0	\$25,154,058	\$47,894,879	\$1,790,838	\$0	\$0	\$74,839,775
AFUDC	\$0	\$434,351	\$3,710,758	\$0	\$0	\$0	\$4,145,109
Total	\$0	\$25,588,409	\$51,605,637	\$1,790,838	\$0	\$0	\$78,984,884

Project Validity Range					
Description	Estimate Range		25% 100% 20%		
	Min %	Max %	Min \$'s	Most Likely \$'s	Max \$'s
EPC Contract Costs	-25%	20%	\$ 20,841,647	\$ 27,788,863	\$ 33,346,636
Progress Energy Provided Procurement Costs	-25%	20%	\$ 23,055,568	\$ 30,740,757	\$ 36,888,909
Progress Energy Labor Costs	-15%	20%	\$ 1,752,523	\$ 2,061,792	\$ 2,474,150
Progress Energy Indirect Material Costs	-25%	25%	\$ 2,648,889	\$ 3,531,852	\$ 4,414,815
Total Project Cost Validity Range			\$ 48,298,627	\$ 64,123,264	\$ 77,124,509
Progress Energy Contingency			\$ -	\$ 9,066,879	\$ 3,400,000
Progress Energy Escalation			\$ -	\$ 915,222	\$ -
Total			\$ 48,298,627	\$ 74,105,366	\$ 80,524,509
Total Fin View - 56% PGN Labor			\$ 74,636,774		