



**Progress Energy**

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AUG 20 2003

BUREAU OF AIR REGULATION

August 13, 2003

Mr. Scott M Sheplak, P.E.  
Florida Department of Environmental Protection  
Bureau of Air Regulation  
Mail Station: #5505  
2600 Blair Stone Road  
Tallahassee, Florida 32399

Dear Mr. Sheplak:

Re: Progress Energy Florida Bartow Plant – Unit 1 Electrostatic Precipitator  
Operation and Maintenance Plan Information

The Department and the Pinellas County Department of Environmental Management have previously reviewed Progress Energy Florida's Title V permit application concerning the Bartow facility's electrostatic precipitator. Progress Energy Florida subsequently received a letter from the Department, dated June 11, 2003, requesting additional information to be included in the electrostatic precipitator's operation and maintenance plan.

As suggested in the Department's letter, I request that the Title V Permit be revised in the name of Progress Energy Florida, Inc.

Enclosed please find the revised operation and maintenance plan incorporating the Department's and County's comments.

Please contact Matt Lydon (727) 826-4152 if you have any questions.

Sincerely,

Brenda Brickhouse  
Bartow Plant Manager

Cc: Wayne Martin, PCDEM

**PROGRESS ENERGY FLORIDA  
BARTOW PLANT UNIT #1 ELECTROSTATIC PRECIPITATOR  
OPERATION AND MAINTENANCE PLAN  
August 2003**

**DESCRIPTION**

This cold-side precipitator is a two-chambered Buell unit built in 1982. The unit was designed to treat a gas volume of 488,000 acfm at 300° F under negative pressure. As of October 2002, this unit was rebuilt. There are two mechanical and five electrical fields in the direction of gas flow. There are 30 gas passes per chamber, formed by 36' high collecting plates 11" apart. Plates in the third (outlet) mechanical fields of each chamber are 12' wide, while those in the second (center) field are 9' wide. The first field is vacant. The discharge electrodes are RDE-1 rigid electrodes with emitter pins on 3" centers.

Electrical power is supplied through five dual-bushing transformer/rectifier sets, each of which is controlled by a BHA, SQ-300 automatic voltage controller, rated at 480 V, 240 A primary and 45 kV, 1800 mA secondary.

Cleaning of the precipitator internals is accomplished by a total of 154 BHA manufactured EGR impact rappers controlled by a BHA, PRC-100 Rapper controls. Collected ash is shed into 12 hoppers, which are equipped with Dynatrol hopper level detector probes and Chromalox heaters.

**EQUIPMENT SPECIFICATIONS**

Original Manufacturer – General Electric Environmental Services, Inc.

Rebuild Manufacturer – BHA Group, Inc.

Precipitator: Model 1-BAB1.2x37(9)36.0-434-4.3P

Number of Electrical Fields .....	5
Number of Bus Sections .....	14
Number of Gas Passes .....	60
Plate Height .....	36'
Emitting Electrodes .....	rigid electrode
Automatic Voltage Controller .....	BHA SQ-300
Electrode Cleaning Methods:	
Emitting System .....	impact rappers
Collecting System .....	impact rappers
Electrode Cleaning Controller .....	PRC-100

**DESIGN PARAMETERS**

Fuel Type .....	No. 6 Fuel Oil
Flue Gas Volume .....	488,000 acfm
Gas Velocity .....	4.07 fps
Normal Flue Gas Exit Temperature .....	300° F
Fly Ash Removal Efficiency for No. 6 Fuel Oil .....	98%

## PROCESS PARAMETERS

Plant operators monitor and may adjust the following Bartow Plant Unit 1 parameters at least once per day to assure efficient plant operations:

- Pressures (furnace, superheat, and reheat)
- Temperatures (superheat, reheat, and fuel)
- Flows (steam, feedwater, and fuel); and
- Unit load

## RAPPER FREQUENCY AND DURATION

- Rapper frequency, plate – 8 half cycles
- Rapper duration, plate – 1 rap – cycle time 8:27:330 (plates 4)
- Rapper duration, plate – 1 rap – cycle time 13:27:330 (plates 5)
- Rapper duration, plate – 1 rap – cycle time 35:14:660 (plates 6&7)
- Rapper duration, plate – 1 rap – cycle time 49:34:660 (plates 8&9)
- Rapper duration, plate – 1 rap – cycle time 60:07:330 (plates 10)

*Please Note: These rapper parameters are NOT set parameters.*

## OPERATIONAL CHECKS

The following parameters are checked and recorded each day of precipitator operation:

- Transformer/rectifier primary voltage (110 to 300 V)
- Secondary voltage – 50 kV
- Transformer/rectifier primary current (20 to 80 A AC)
- Transformer/rectifier secondary current (0.07 to 0.54 A DC)
- Transformer/rectifier spark rates (0 to 30 sparks/min.)

Other parameters, listed below, are monitored during precipitator operation but not recorded. These parameters are alarmed locally (in the precipitator control room) and there is continuous monitoring by an alarm to the main control room, as a 'Precipitator Trouble' alarm.

Precipitator Control Room:

Checks for Alarms:

- Transformer/rectifier low voltage – Alarms at 50V and 10 kV
- Transformer/rectifier over current – Alarms at 300A and 22502 MA
- Transformer/rectifier high oil temperature – Alarms at 50 deg. C
- Control cubicle fan failure

- Insulator heater system failure
- Rapper control cabinet loss of power
- Purge system airflow failure
- Purge system fan failure
- Control room high temperature
- Hopper heaters low temperature
- Hopper ash level high

Other Checks:

- Check for rapper faults on WinRap program on precipitator controls computer
- Check that transformer control cubical fans are in operation.
- Check for transformer/rectifier trips on local switch cabinet.
- Check AVC (WinDac) precipitator controls computer for abnormal conditions daily.
- Check for leaks through doors, manholes, etc. on the 2<sup>nd</sup>, 4<sup>th</sup>, and 8<sup>th</sup> floors at least monthly.

## MAINTENANCE PLAN

The majority of precipitator maintenance is done during planned unit outages. Planned outages generally occur every two years. Unplanned unit outages occur due to some type of failure or operational problem with either the precipitator or the steam unit. Unplanned unit outages required due to steam unit performance may also be an opportunity to perform precipitator maintenance. Whether an unplanned outage is necessitated by precipitator performance will depend on the type and significance of precipitator equipment failure. Such a decision depends on the engineering judgement of responsible Progress Energy personnel.

Outage related maintenance work may include the following:

- Complete precipitator cleaning and inspection, depending on time lapse since last complete inspection.
- Inspection and repair as needed of transformer rectifiers.
- Inspections and repair as needed of hoppers and hopper heaters.
- Cleaning of transformer/rectifier set, support and rapper insulators.
- Replace gaskets on doors and manholes as needed
- Weld repair of plates as needed to repair areas of corrosion.
- Properly align rigged electrodes, plates, and frames internally.

Maintenance activities are documented on several forms. Attached are samples of a Trouble Report form and the computerized maintenance planned or completed report format from the Productivity Measurement System.

**SPARE PARTS**

The following is a list of major items stocked. There are many other small parts not listed such as clips, fuses, lighting fixtures, etc. Quantities and spare parts carried vary with time of year, determination of need as equipment ages and economic reorder quantities (i.e.: pricing in quantities).

PART	QUANTITY
Hopper heater .....	29
Insulator shaft - Alumina .....	2
Insulator support .....	7
SQ-300 AVC controller .....	1
EGR rapper assembly .....	1
EGR rapper coil assembly .....	2
EGR rapper gaskets .....	6
Adjusting Bolt .....	2
Rapper Boot Seals .....	5
Rapper boot seal clamps .....	15
Insulator shaft – Porcelain .....	1
Heater element .....	5
Rapper steering diode assembly .....	1
Fuses .....	6
PRC-100 rapper Triac board .....	1
PRC-100 rapper power module .....	1
PRC-100 rapper IFB board .....	1

# PROGRESS ENERGY - BARTOW STEAM PLANT

## ESP WORK LOG (Work orders history)

Passport Information Portal - Query Results

For Information Only. PassPort is the Application of Record.

WORK ORDERS AND WORK ORDER TASKS (Facility: BAR --- Date: 8/11/2003 4:18:57 PM)

Wo_Facility	Wt_Unit	Wo_Work_Order_Nb	Wt_System_Code	Wt_Wo_Tsk_Status	Wo_Description	Wo_Planner	Wo_Start_Date	Wt_Completion_Date
BAR	1	439137	BA	85	U1/EL/PRECIP RAPPER B164 IN ALARM "SHORT"	BETSAE	20030728	20030811
BAR	1	443208	BA	50	K/M/U1/PRECIP. VENT LINE IS PLUGGED	HENDEL	20030808	20030808
BAR	1	437336	BA	85	PRECIPITATOR RAPPER SYSTEM TROUBLE SYSTEM CURRENT IS TO HI	BETSAE	20030724	20030807
BAR	1	427545	BA	85	M/U1 RECONFIGURE 90 DEGREE FILTER BAG DUMPSTER ATTACHMENT	BOYDRO		20030801
BAR	1	413916	BA	85	M/W12 GAS RECIRC DMPRS	BOYDRO		20030801
BAR	1	427311	BA	85	M/W2 CLN ASH TRANS PIPE	BOYDRO		20030729
BAR	1	437535	BA	85	K/U1 INSTALL LINERS IN BLUE ASH BOX'S	BOYDRO		20030725
BAR	1	422269	BA	85	I&C /U1 #1 AND #1A IK'S NEED AIR ISOLATION VALVES	PAULDA	20030617	20030725
BAR	1	361359	BA	85	M/U1 PRECIP STEEL RUSTED OUT "A" OUTLET STRUCTURE	BOYDRO		20030725
BAR	1	427544	BA	85	M/U1 PRECIP FLEX HOSE TO FLYASH DUMPSTER KINKED	BOYDRO	20030629	20030721
BAR	1	294067	BA	85	M/W48 FLYASH AIR TK MAINT	BOYDRO		20030717
BAR	1	294067	BA	85	M/W48 FLYASH AIR TK MAINT	BOYDRO		20030717
BAR	1	409028	BA	50	M/U1 ASH TRANSPORT PIPE COLLAPSED IN TWO AREAS	BOYDRO		20030716
BAR	1	431204	BA	85	K/M/U1/PRECIP.---T-108 WILL NOT PRESSURIZE- INSPECT	HENDEL	20030709	20030715
BAR	1	433367	BA	85	EL/U1 PRECIPITATOR	BETSAE		20030714
BAR	1	409288	BA	85	I/PRECIP/WORK ON PC LOGIC	PAULDA	20030516	20030710
BAR	1	421469	BA	85	M/W2 CLN ASH TRANS PIPE	FISHER		20030708
BAR	1	423275	BA	85	J/U1 REMOVE ASH FROM BLUE BOX "D"	BOYDRO		20030707
BAR	1	409020	BA	85	I/U1/PRECIP INSTRUMENT AIR FILTERS NEED TO BE CHANGED	PAULDA		20030707
BAR	1	410269	BA	85	M/W2 CLN ASH TRANS PIPE	BOYDRO		20030702
BAR	1	409028	BA	50	M/U1 ASH TRANSPORT PIPE COLLAPSED IN TWO AREAS	BOYDRO		20030701
BAR	1	421855	BA	85	I/U1 T-109 TRANSPORT AIR REGULATOR BLOWING OUT VENT	PAULDA		20030626
BAR	1	369420	BA	85	M/U1 FLYASH DUMPSTER CONTAINMENT AREA, REPLACE BULLARD	BOYDRO	20030204	20030626
BAR	1	424757	BA	85	K/M/U1/ FLYASH DUMPSTER YVACUUM VENT LINE TO BOILER.	HENDEL	20030623	20030623
BAR	1	380793	BA	85	M/W12 1A&1B ID FAN DMPRS	BOYDRO		20030623
BAR	1	416042	BA	85	M/W2 CLN ASH TRANS PIPE	BOYDRO		20030620
BAR	1	404521	BA	85	M/W2 CLN ASH TRANS PIPE	BOYDRO		20030617
BAR	1	361359	BA	85	M/U1 PRECIP STEEL RUSTED OUT "A" OUTLET STRUCTURE	BOYDRO		20030617
BAR	1	409034	BA	85	I/U1 T-109 TRANSPORT AIR REGULATOR BLOWING OUT VENT	PAULDA	20030515	20030616
BAR	1	380794	BA	85	M/W12 GAS RECIRC DMPRS	BOYDRO		20030610
BAR	1	417005	BA	85	M/U1 "A" A/H HIGH DIFF. NEEDS WASHING	BOYDRO		20030609
BAR	1	402375	BA	85	M/U1 INSTALL REMAINING CASTELL-KEY LOCKS.	BOYDRO		20030609

Facility: BAR BARTOW PLANT  
 WR Originator: SAVAGM SAVAGE JR. M F  
 Unit : 1 Project :  
 W/O Type: CO TSK PRI: 4 W/O Dspln: K  
 Planner : HENDEL HENDERSON L L  
 W/O Title : K/M/U1/PRECIP. VENT LINE IS PLUGGED  
 W/O Task Title: K/M/U1/PRECIP. VENT LINE IS PLUGGED  
 Task Dspln : K Due By: 08/08/03

**Work Order Package**

(Single Work Order)  
 00443208 01

Rpt : TIPMC11  
 Date: 08/11/03



**Work Order Task Written To**

Facility : BAR Unit : 1 Sys: BA PMT:  
 Equipment : PIP BA1BA3020000000 Component:  
 Work Item : Eqt. List: Review Reqd:  
 Equip. Tag: BA1-PRECIPITATOR-PIPING Alt:  
 Catalog ID: Job Type : CO UCR:A UTC :  
 Name : BA1 PRECIPITATOR PIPING  
 Location :  
 Crew :  
 Resource Type: PERS Resource Code: FINT Qty: 1 Duration:  
 Cost Centr: 60953D Activity : User Def:  
 Percentage: 100.000 Acct No. : 00 20016145 W0300  
 CPM Proj : NONSCHED Network Reference:

**Work Order Task Instructions**

PRECIP.--VENT LINE TO THE BOILER IS PLUGGED.  
 PLEASE INVESTIGATE AND RETURN TO SERVICE ASAP.

**Rework/Approval**

Deficiency Tag No.: Loc: Tag Removed:  
 Rework Job : Comments:

**Task Requirements**

FAC.	REG/REQ	VALUE	COMMENTS
BAR	ASBESTOS		
BAR	CLR REQ		
BAR	FIRE PROT		
BAR	HOTWRK PMT		
BAR	INSU		
BAR	NDE REQ		
BAR	PMT		
BAR	SCAFFOLD		
BAR	SECURITY		
BAR	WELD DOC		



Facility: BAR BARTOW PLANT  
 WR Originator: SAVAGM SAVAGE JR. M F  
 Unit : 1 Project :  
 W/O Type: CO TSK PRI: 4 W/O Dspln: K  
 Planner : HENDEL HENDERSON L L  
 W/O Title : K/M/U1/PRECIP. VENT LINE IS PLUGGED  
 W/O Task Title: K/M/U1/PRECIP. VENT LINE IS PLUGGED  
  
 Task Dspln : K Due By: 08/08/03

**Work Order Package**

00443208 01

Rpt : TIPMC11  
Date: 08/11/03

Page: 2



**Authorization**

Start Permission : \_\_\_\_\_ Date: \_\_\_\_\_

**Failure/Action Taken/As Found**

Failure Category Code (F/NF) \_\_\_\_\_  
 Action Taken Category Code: \_\_\_\_\_  
 As Found Sub Category Code: (1-5) \_\_\_\_\_

**Deficiency Tag Loc:**

Deficiency Marker or Tag: \_\_\_\_\_  
 Removed (Y/N) \_\_\_\_\_

**Work Completion Signatures**

Name	Function/Dept.	Date
_____	_____	_____
_____	_____	_____
_____	_____	_____

Comments: \_\_\_\_\_  
 (rework?) \_\_\_\_\_

**Rework Reason/Cause**

	(Y/N)
CT COMPONENT FAILED	-
I W INCOMPLETE WORK FROM MAINTENANCE	-
N/A NON APPLICABLE	-

Date: \_\_\_\_\_  
 Comments: \_\_\_\_\_

Facility: BAR BARTOW PLANT  
WR Originator: SAVAGM SAVAGE JR. M F  
Init : 1 Project :  
W/O Type: CO TSK PRI: 4 W/O Dspln: K  
Planner : HENDEL HENDERSON L L  
W/O Title : K/M/U1/PRECIP. VENT LINE IS PLUGGED  
W/O Task Title: K/M/U1/PRECIP. VENT LINE IS PLUGGED  
Task Dspln : K Due By: 08/08/03



**Work Order Package**

00443208 01

Rpt : TIPMC11  
Date: 08/11/03

Page: 3

**Completion Comments on Work Performed**

Completion Comments Required : Y

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Comments: \_\_\_\_\_  
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Comments: \_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_

Continued on Additional Sheets? : \_\_\_\_\_