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AIR REGULATION



State of Florida  
Department of Air and Water Pollution Control

Application for Permit to Operate Air Pollution  
Sources

RECEIVED  
MAR 3 1971  
DEPT. OF A.W.P.C.  
WEST CENTRAL REGION  
WINTER HAVEN

RECEIVED

MAR 3 1971

CENTRAL REGION

Applicant  
(Owner or authorized agent)

G. W. Marshall, Production Superintendent  
(Name and Title)

Name of Establishment

Florida Power Corporation (Crystal River #2)  
(Corporation, Company, Political SD, Firm, etc.)

Mailing Address

P. O. Box 38, Inglis, Fla. 32649

Location of Pollution Source

<sup>32</sup>04510 m N

Red Level, Fla.

(Number and Street)

(City)

<sup>3</sup>34400 m E

Citrus

(County)

Nature of Industrial Operation

Electric Utility

Permit Applied For Operating:

Project Engineer:

New Source

☐

G. W. Marshall

Name

Existing Source

☒

Florida Power Corporation (Crystal River #2)

Firm

Existing Source after modification

☐

P. O. Box 14042, St. Petersburg, Fla. 33733

Mailing Address

Existing Source after Expansion

☐

G. W. Marshall

Signature

Existing Source After relocation,  
expansion or reconstruction

☐

6008

Florida Registration Number

For Department's Use Only

Permit No.

Date:

The undersigned ~~XXXXXX~~ authorized representative\* of Florida Power Corporation

fully aware that the statements made in this form and the attached exhibits and statements constitute the application for an Operation Permit from the Florida Department of Air and Water Pollution Control and certifies that the information in this application is true, correct and complete to the best of his knowledge and belief. Further, the undersigned agrees to comply with the provisions of Chapter 403, Florida Statutes and all the rules and regulations of the Department or revisions thereof. He also understands that the Permit is non transferable and, if granted a permit, will promptly notify the Department upon sale or legal transfer of the permitted establishment.

G. W. Marshall

Signature of ~~XXXXXX~~ agent.

G. W. Marshall, Production Superintendent  
Name and Title

Date: March 3, 1971

\*Attach letter of authorization.

#### Project History

DAWPC CONSTRUCTION PERMIT NO. & DATE \_\_\_\_\_

DIVISION OF HEALTH SERIAL NO. & DATE \_\_\_\_\_

and ~~XXXXXX~~ Control Facilities

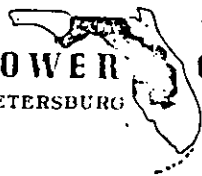
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### A. Raw Materials and Chemicals Used.

3-D

**FLORIDA POWER CORPORATION**

ST. PETERSBURG FLORIDA



**RECEIVED**

February 18, 1971

MAR 1 1971

DEPT. OF A.W.P.C.  
WEST CENTRAL REGION  
WINTER HAVEN

Florida Department of  
Air and Water Pollution Control  
Suite 300, Tallahassee Bank Building  
315 South Calhoun Street  
Tallahassee, Florida 32301

Subject: Letter of Authorization

Gentlemen:

Please be advised that Mr. George W. Marshall, Production Superintendent, is properly authorized to be the representative in matters relating to Applications for Permits to Operate Existing Air and Water Pollution Sources of Florida Power Corporation, as required by the Florida Department of Air and Water Pollution Control.

Very truly yours,

FLORIDA POWER CORPORATION

A. U. Ormston  
Vice President

AJO:Bjh

## B. Fuels

Type (Be Specific)	Daily Consumption	Gross Maximum Heat Output	Relate to Flow Diagram
Coal	3,182 Tons/Day	72,700,000,000 Btu/Day	1

## C. Products

Description	Average Daily Production (Tons/Day, Lbs/Hr. etc.)
Electricity	7,128 MWH/Day

D. Normal operation: Hours/Day 24 Hrs/Day Day and Week 7 Days/Week

If operation or process is seasonal, describe: \_\_\_\_\_

24 7/22  
72

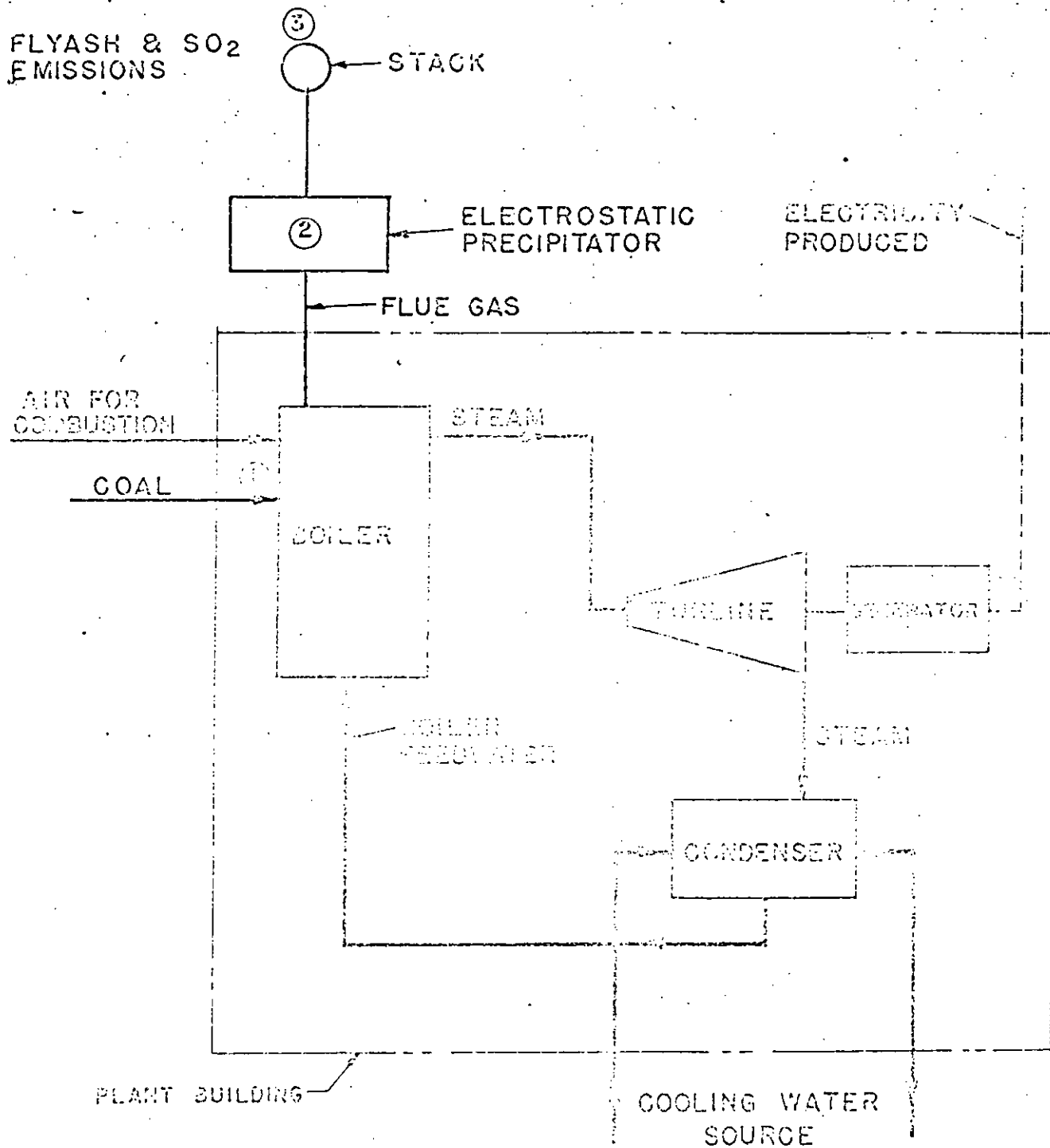
## II Identification of Air Contaminants

Compounds of:

Also —

Chlorine	<input type="checkbox"/>	Hydrocarbons	<input type="checkbox"/>	Acid Mists	<input type="checkbox"/>
Fluorine	<input type="checkbox"/>	Smoke	<input type="checkbox"/>	Odors	<input type="checkbox"/>
Nitrogen	<input type="checkbox"/>	Fly Ash	<input checked="" type="checkbox"/>	Radioisotopes	<input type="checkbox"/>
Sulfur	<input checked="" type="checkbox"/>	Dusts	<input type="checkbox"/>	Other _____	<input type="checkbox"/>

Specific Compounds SO<sub>x</sub>



# AIR POLLUTION FLOW DIAGRAM

UNIT-2 CRYSTAL RIVER PLANT

DRAWING NO. A - 705 - CR

DATE 2-4-71 SCALE NONE BY IRS

SP 4/1/71

PLANT  
BOUNDARY

ELECTRICITY  
PRODUCED

ELECTRICITY  
PRODUCED

UNIT - 2

GEN.

TURBINE

UNIT - 1

GEN.

TURBINE

①

FUEL IN

①

FUEL IN

UNIT - 2  
BOILER

UNIT - 1  
BOILER

ELECTROSTATIC  
PRECIPITATOR

FLUE GAS TO STACK

②

STACK #2

②

STACK #1

NORTH  
↑

PLANT PLOT PLAN

CRYSTAL RIVER PLANT  
FLORIDA POWER CORPORATION  
ST. PETERSBURG, FLORIDA

NO.	DATE	REVISION	BY	CK.	APP.

DATE 2-6-71 SCALE NONE BY JDS CKD APP

DRAWING NO. A - 104 - CR

### III Air Pollution Control Devices

Contaminant	Control Device	Relate to Flow Diagram	Operating Efficiency	Conditions (Particle Size Range, Temp. etc.)
Fly Ash	Electrostatic Precipitator	2	98%	1 - 60 microns 320°F @ 117 ft/sec.
Fly Ash	Stack	3	N/A	N/A
SO <sub>x</sub>	Stack	3	N/A	N/A

Provide a brief description of the control device or treatment system. Attach separate sheets giving details regarding principle of operation, manufacturer, model, size, type and capacity of control/treatment device and the basis for calculating its efficiency. Show any bypasses of the control device and specify when such bypasses are to be used and under what conditions.

(See Attachment #1)

98% is the manufacturers desired efficiency based upon design calculations. The precipitator has not been tested, hence an operating efficiency is not available.

This unit will be converted to burn oil in September, 1971. Any efficiencies experienced with burning coal would not be representative of burning oil, therefore, we do not anticipate testing the precipitator efficiency while burning coal. We will report on its effectiveness while burning oil in the 1972 Application.



#### IV. Contaminant Balance

From contaminant content in raw materials, waste products, and manufactured products, summarize daily contaminant flow:

	Pounds Contaminant per Day (AVG)	
	Input	Output
List <del>XXXXXXXXXX</del> Fuel:		
Fuel Sulfur	203,600 Lbs/Day	
Fuel Ash	655,400 Lbs/Day	
List Manufactured Products:		
Electricity	N/A	N/A
List Solid Wastes: (Total Retained Ash)		644,800 Lbs/Day
List Liquid Wastes: N/A		
Totals	859,000 Lbs/Day	644,800 Lbs/Day
Airborne Wastes (Total input minus total output)		
214,200 Lbs/Day		

Note: If more than one contaminant, specify each

Contaminants recovered in control devices should be shown as either a liquid or a solid waste.

## V. Discharged Emissions to Atmosphere

#### A. Discharge Points and Design Conditions

[illegible]

Tabulation of Discharged Contaminants (Calculated values)

## Total Contaminants Discharged

Discharge Point - Relate to Flow Diagram	Flow Rate at Std. Cond. (cfm)	Particulates		Other Contaminants (F <sup>-</sup> , SO <sub>x</sub> , NO <sub>x</sub> etc.)			
		Gr/ft3 (Std. Cond.)	lbs./Day	Gr/ft3 (Std. Cond.)	lbs./Day	Gr/ft3 (Std. Cond.)	lbs./Day
Ge tions) Stack	1,256,700	.041	10,600	SO <sub>x</sub> .834	216,000		
	(State Std. Cond. Used)						
	300°F, 29.92" Hg						
-----							
Emission tion and ency -----	Stack 1,700,000	.043	N/A	SO <sub>x</sub> .836	N/A		
Frequency is Hrs./Day)							
Totals							

## VI. Treatment and Disposal of Liquid and Solid Waste

1. Identify the contaminants which will be discharged as liquid or solid wastes.

Total Retained Ash

2. Describe the treatment and disposal of liquid and solid wastes. Indicate the concentrations and volume of individual contaminants in treated wastes before disposal.

The amount of Retained Ash is approx. 218,600,000 Lbs/Yr.

The Ash is pumped wet to a storage area on Plant Property.

State of Florida  
Department of Air and Water Pollution Control  
Application for Permit to Operate Air Pollution Sources

FOR: Florida Power Corporation (Crystal River #2)

ATTACHMENT #1:

Crystal River #2 Unit is equipped with an electrostatic precipitator which is situated immediately before the stack. There are no bypasses to this control device.

The precipitator is manufactured by Buell Engineering Company, Inc. It is Model No. 1.2 x 43K 330/3 2P. Its capacity is 4,514,000 Lbs/Hr of fuel gas.

BUELL ENGINEERING COMPANY, INC.

253 North 4th Street, Lebanon, Pa.

Section I: Fundamentals of Electric Precipitator Operation

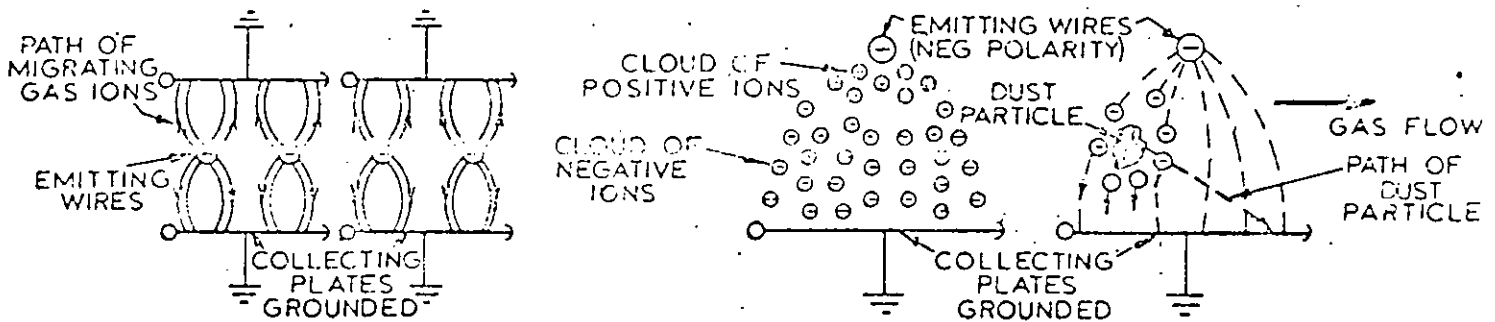
Electric precipitator construction and operation are based on the fact that dust particles passed between a highly charged and a grounded electrode will collect on the grounded electrode.

Accordingly, the Buell electric precipitator is engineered to:

- (1) Apply a high negative charge to air or gas-borne dust particles.
- (2) Collect the particles on grounded metal plates which are periodically vibrated to dislodge the dust into hoppers below.

The particles are charged by rows of vertical wires mounted in parallel frames six to twelve inches apart. The frames are connected at the top to the negative terminal of a high voltage DC power supply (30,000 to 50,000 volts). The collecting plates are parallel to the rows of wires and alternate with them -- i.e., plate, wire frame, plate, wire frame, etc. Air (or gas) flow is parallel to the wire frames and, of course, to the collecting plates.

In operation, the high potential between the negative and grounded electrodes ionizes the surrounding air (or gas) and produces a large number of negative ions. (This is known as corona effect.) These negative ions collide with the dust particles and impart their negative charges to them. The negatively charged particles are then drawn to the grounded collecting plates, from which they are periodically dislodged by means of a rapping mechanism.



In the above illustration the "cloud of positive ions" shown is an electrical phenomena which occurs in a minute area immediately surrounding the emitter wire. It is a normal reaction of corona emission and affects only a small fraction of a percent of the dust involved.