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ENVIRONMENTAL REPORT
IN SUPPORT OF
APPLICATION FOR SITE CERTIFICATION
FOR
EXPANSION OF EXISTING PALATKA POWER PLANT

FLORIDA POWER & LIGHT COMPANY
P. O. BOX 3100
MIAMI, FLORIDA 33101

EXTRACTED
PAGES

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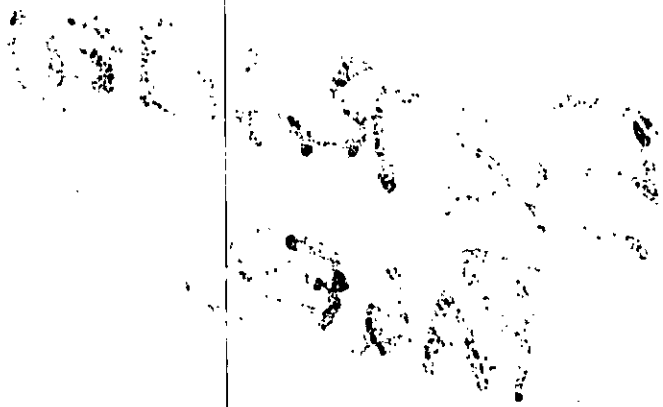


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INTRODUCTION

An analysis of Florida Power & Light Company's (FP&L) projected 1975 generating capacity and service requirements indicate that additional generating capacity will be needed to meet expected peak demands. In 1975, the projected power load will be 9,000 mw. With all existing units on line, FP&L's generating capacity is only 9,369 mw; hence, a reserve of 396 mw (4.4 percent). This reserve is unacceptable. If the FP&L Turkey Point No. 3 generator (760 mw) should inadvertently have to be brought off line, FP&L would not be able to generate service equal to the demand.

In response to the projected power needs, FP&L made application (November, 1973) for permits to construct two, 280 mw gas turbine generating units at FP&L's Palatka Plant. In December, 1973, an additional 226 mw of steam electric generating capacity at the Palatka Plant was proposed. The inclusion of these generators would increase FP&L system capability to 9,916 mw, which would increase the reserve capability to 916 mw (10.2 percent).

The proposed steam generating facility will entail the addition of waste heat recovery boilers to the proposed gas turbines at the Palatka Plant. Steam produced in the waste heat recovery boilers will be used to drive steam turbine generators. The combined system will be the most efficient package, when converting fuel energy to electrical energy, available to FP&L by April 1, 1975.

Engineering and environmental investigations and analyses indicate that this project can be designed, construction and operated so as to comply with all applicable Federal, state, and local environmental standards and regulations.

In accordance with the Florida Department of Pollution Control guidelines concerning steam generator siting, FP&L respectively submits this report entitled "Environmental Report in Support of Application for Site Certification for Expansion of Existing Palatka Power Plant".

1. PERTINENT APPLICANT INFORMATION

1. Company or Applicant's Official Name - Florida Power & Light Company
2. Address - P. O. Box 3100, Miami, Florida 33101
3. Address of Official Headquarters - P. O. Box 3100, Miami, Florida 33101
4. Business Entity (Corporation, Partnership, Co-op, Etc.) - Florida Power & Light Company is a corporation chartered in Florida in December, 1925.
5. Name and Title of Business Head - Company official directly responsible for obtaining certification is Dr. Donald D. Dunlop. He is Vice President of the Environmental Planning and Research Department. The Project Coordinator from the Environmental Planning and Research Department, Environmental Affairs section responsible for obtaining this certification is W. J. Barrow, Jr. Any questions pertaining to this application should be directed to him at Florida Power & Light Company, P. O. Box 3100, Miami, Florida 33101, Phone 305/446-3161 Ext. 288.
6. Site Location - Putnam County
7. Nearest Incorporated City - Palatka, Florida
8. Latitude and Longitude - Lat. $29^{\circ}37'43''$, Long. $81^{\circ}35'25''$
UTM: East 443350 North 3277560
9. Initial Generating Capacity:

<u>564 MW</u>	Gross
<u>552 MW</u>	Net
10. Proposed Generating Capacity:

<u>564 MW</u>	Gross
<u>552 MW</u>	Net
11. Additional Remarks

3.7 Air Emissions

ESE (1974) estimated emissions of sulfur dioxide, particulate matter, and oxides of nitrogen from the new combined cycle units on the basis that the new units will average a 60 percent load. ESE also estimated the height and diameter of the gaseous discharge stacks as well as the temperatures and velocity of the gaseous discharges. In addition, ESE estimated the 1975 emissions from existing sources on the assumption that all existing sources would meet with Florida State emission standards and that they would be operating approximately as they were in 1972. These estimates are given in Table 3.1.

3.8 Associated Transmission Facilities

No associated transmission lines are necessary for this project. Existing transmission facilities have adequate capacity and will be utilized except from the proposed units to the adjacent switchyard.

TABLE 3.1. ESTIMATED 1975 EMISSION INVENTORY IN THE PALATKA AREA (a)

Source	Average Sulfur Dioxide Emissions, tons/day	Average Particulate Matter Emissions, tons/day	Nitrogen Oxides Emissions tons/day	Stack Dimensions		Gaseous Discharge	
				Height above ground, m	Diameter, m	Velocity, m/sec	Temp, C
Hudson Pulp and Paper							
No. 3 Recovery Boiler	0.0	0.4	-	40.5	3.0	7.3	90
No. 4 Recovery	0.0	0.3	-	40.0	1.4	19.0	71
No. 4 Lime Kiln	0.0	1.4	-	76.2	3.0	22.6	204
No. 4 Bark Boiler	1.7	0.4	-	48.2	3.0	15.5	57
No. 5 Power Boiler	4.3	0.6	-	48.2	2.7	15.1	232
Florida Power and Light							
Units No. 1 and 2	9.0	0.8	-	45.7	4.0	27.0	135
Total Combined Cycle Units	24.6	3.3	21.2	16.2	3.0	27.7	177

(a) Environmental Science and Engineering, Inc. 1974.

(b) Estimates for a 60 percent load.

5. ENVIRONMENTAL EFFECTS OF PLANT OPERATION

5.1 Effects of Operation of Heat Dissipation Systems

Aquatic. There will be no thermal effluent discharged into the St. Johns River; hence, there will be no thermal impact on the aquatic ecosystem.

Operation of the barge slip should have no detrimental impact on the aquatic environment. In fact, construction of the slip will reduce the potential for a major impact should an oil spill occur. The slip will be outfitted with a traveling boom which will be used to trap any oil released from oil transfer operations.

Entrainment of planktonic organisms and weak swimmers (phytoplankton, zooplankton, fish larvae, and fish fry) and the impingement of larger fishes on the traveling screens are potentially the most severe impacts that can occur affecting the aquatic community.

The plant will require about 4,500 gpm of water to be withdrawn from the St. Johns River. If the larger fishes (larger in diameter than the 3/8-inch mesh of the traveling screens) were randomly distributed in the river and could not avoid the intake structure, less than one-sixth of one percent of the fish population of that size would be caught by the traveling screens. However, fishes are not randomly distributed, and they can, by swimming, avoid the intake structure. The horizontal intake velocity is less than 0.5 fps. At intake velocities below 1.0 fps, adult fishes should be able to avoid being caught on the traveling screens; young fishes or weak adults swimming too near the intake could be impinged (Hays, 1970; Laurence, 1972). Also, two flush mounted fish passages will be located on either side of the intake structure which will aid in minimizing the number of fishes impinged on the traveling screens. Therefore, it is doubtful that even less than one sixth of one percent of the fish population will be impinged on the traveling screens.

The proposed peaking facility at the Palatka site will utilize deep-well injection for effluent discharge. This means that all organisms entrained in the plant cooling water will be removed from the St. Johns River and a mortality of 100 percent will occur. However, based on data being collected at the existing facility, a small percentage of organisms are actually entrained. Further studies are in progress which will more exactly determine the population percentage to be affected.

The possibility of fishes being attracted to the general area of the proposed intake structure by the existing thermal effluent from the present plant has been considered. This condition should not have any marked increase in the number of impinged fishes. Because the intake structure is located upstream of the present effluent and will be located adjacent to and south of the proposed barge slip, it is very unlikely that this warm-water plume will come close to the new intake structure. Also, the fish passages and the low intake velocity should provide adequate protection against impingement of large numbers of fishes.

Terrestrial. No adverse effects to the terrestrial environment are expected to result from operation of the proposed facility.

To maintain tunnel utilities and allow safe crossing of Highway 17, stairs will be provided at each end of the tunnel. Also, the tunnel floor will be sloped to insure adequate drainage. The sumps will be outfitted with pumps and will pump drainage water to the oil-water separator located in the diked area for proper disposal.

Atmosphere. The effects of plume visibility, fog, and drift from the proposed cooling towers were evaluated by Ray L. Lyerly & Associates (RLL) consultants to FP&L. In their evaluation (see Appendix D) RLL cited experience with similar towers at Lake Worth and Gainesville and concluded that it was reasonable to expect no visible plume over 70 percent of the time. RLL also concluded that it would be extremely unlikely that a ground fog would develop as a result of the tower and that drift will not create any measurable environmental effects.

Blowdown from the cooling towers will be injected into a disposal well. Consequently, no surface environmental effects from the blowdown are expected.

5.2 Effects of Chemical and Biocide Discharges

All thermal and chemical effluents are to be deep-well injected, hence, no surface terrestrial or aquatic impacts are expected.

Based on available data (Section 3.5) deep-well injection will not result in a negative impact to the receiving waters.

5.3 Effects of Sanitary and Other Waste Discharges

No new sanitary discharges will occur from the proposed facility; existing FP&L facilities will be utilized for waste disposal. The addition of approximately 50 employees for the proposed facility will not overload the existing sanitary waste system.

5.4 Effects of Air Emissions

The 1975 air quality in the Palatka area was estimated by ESE (1974) using AQDM and short-term models plus the emission inventory and the stack parameters listed in Table 5.1. Considering only the existing sources and assuming that they meet the State emission standards, the highest annual average is estimated to be approximately $0.8 \mu\text{g}/\text{m}^3$. The estimated incremental annual average sulfur dioxide levels due to the new combined cycle units indicate that the new units will contribute a maximum of approximately $5 \mu\text{g}/\text{m}^3$. When considering all the sources, the maximum annual average will be approximately $5 \mu\text{g}/\text{m}^3$. With or without the new units, the annual average sulfur dioxide concentrations will be well below the air quality standard of $60 \mu\text{g}/\text{m}^3$. The short-term models were used to estimate the maximum 24-hour and 3-hour concentrations resulting from the new combined cycle gas turbine units. The meteorological conditions assumed are expected to yield a "worst-day" situation and were based upon ESE's experience with the short-term model in Jacksonville, Florida. Table 5.2 summarizes the results of the short-term model. As shown, the short-term model indicates that the State standard of $260 \mu\text{g}/\text{m}^3$ maximum 24-hour concentration for sulfur dioxide may be exceeded. ESE indicates that,

TABLE 5.1. MAXIMUM SULFUR DIOXIDE AND SUSPENDED PARTICULATE MATTER^(a) LEVELS WITHIN THREE MILES OF FLORIDA POWER AND LIGHT IN PALATKA^(b). LONG-TERM MODEL CALCULATIONS ($\mu\text{g}/\text{m}^3$)^(c)

Control Strategy	Maximum Annual Concentrations		Maximum 24-Hour		Maximum 3-Hour
	Sulfur Dioxide Annual Average	Suspended Particulate Matter Annual Geometric Mean	Sulfur Dioxide	Suspended Particulate Matter	Sulfur Dioxide
All significant sources, 1972	1	41	15	110	40
All existing sources meeting the Florida allowable Emissions Standards and same operating rate as 1972	<1	31	10	35	30
All existing sources and new combined cycle units meeting the Florida allowable Emissions Standards	6	32	70	45	200
Florida Standards	60	60	260	150	1300

(a) Includes a background concentration of $30 \mu\text{g}/\text{m}^3$.

(b) Environmental Science and Engineering, Inc. 1974.

(c) Short-term maximum concentrations are calculated on the conservative basis of a standard 24-hour geometric deviation of 3.0 for sulfur dioxide and 2.0 for suspended particulate matter.

TABLE 5.2. ESTIMATED MAXIMUM SHORT-TERM SULFUR DIOXIDE AND SUSPENDED PARTICULATE MATTER CONCENTRATIONS ($\mu\text{g}/\text{m}^3$) NEAR THE COMBINED CYCLE UNITS^(a). SHORT-TERM MODEL CALCULATIONS^(b)

	Sulfur Dioxide Levels		Suspended Particulate Matter Levels ^(b)
	Maximum 24-Hour	Maximum 3-Hour	Maximum 24-Hour
Incremental impact of the combined cycle units	250	570	64
All sources (including the combined cycle units)	290	670	67
Florida Standards	260	1300	150

(a) Environmental Science and Engineering, Inc. 1974.

(b) ESE indicated that, based on their experience, the estimates may be overcalculated by at least a factor of four.

(c) This includes an estimated background level of $30 \mu\text{g}/\text{m}^3$.

based on their experience, the estimates may be overcalculated by at least a factor of four. All other concentrations are expected to be well below any applicable standard. The short-duration downwash situation may occur, but was not considered by ESE.

5.5 Effects of Operation and Maintenance of the Associated Transmission System

New transmission facilities are not required for the proposed facility.

5.6 Other Effects

The effects of noise associated with the operation of the proposed facility are not included in this report. However, Battelle's Columbus Laboratories has work under way to collect and analyze the necessary data. The results of that study will be presented in a supplemental report within 30 days of submission of this report.

APPENDIX A

JUSTIFICATION OF JACKSONVILLE'S WEATHER
DATA FOR AIR QUALITY CALCULATIONS

P.O. Box 13454 • UNIVERSITY STATION • GAINESVILLE, FLORIDA 32604 • 904/372-3318

environmental science and engineering, inc.

AN EQUAL OPPORTUNITY EMPLOYER

REFERENCE _____

ENVIRONMENTAL SCIENCES
BIOLOGY
CLIMATE BIOLOGY
MARINE BIOLOGY
MUTATION BIOASSAYS
PLANT ECOLOGY
SOIL SCIENCE
STATISTICS
ENVIRONMENTAL ECONOMICS

ENVIRONMENTAL ENGINEERING
AIR QUALITY MANAGEMENT
DISPERSION MODELING
OCEANOGRAPHY
COASTAL ENGINEERING
HYDROLOGY
GEOLOGY
GEOLOGICAL ENGINEERING
WASTEWATER MANAGEMENT
SOLID WASTE MANAGEMENT
OCCUPATIONAL SAFETY/HEALTH

March 13, 1974

Dr. Gilbert E. Raines
Battelle Corp.
Columbus Laboratories
505 King Ave.
Columbus, Ohio 43201

Dear Dr. Raines:

Please find enclosed one copy of the letter sent to Earl Weber on March 6.

If you have any questions or comments, please feel free to call me.

Sincerely,

ENVIRONMENTAL SCIENCE &
ENGINEERING, INC.



Robert E. Holden
Associate Engineer

REH:peg

Enclosure

P.O. Box 13454 • UNIVERSITY STATION • GAINESVILLE, FLORIDA 32604 • 904/372-3318

environmental science and engineering, inc.

AN EQUAL OPPORTUNITY EMPLOYER

REFERENCE _____

March 6, 1974

Mr. Earl Heber, Consultant
 Florida, Power and Light Company
 Post Office Box 3100
 Miami, Florida 33101

Dear Mr. Heber:

This letter is to confirm our telephone conversation of March 5, 1974.

At the time Environmental Science and Engineering, Inc. (ESE) was first awarded the contract to do the air quality impact study for the proposed new electrical generating units in Palatka, the meteorological data, utilized in the AQDM, was obtained from the nearest weather station for which the "star" data was available. This data was gathered at the Jacksonville Municipal airport in 1972.

Since that time, it has come to our attention that "star" data is available for the Daytona Beach area. Although Daytona Beach is several miles closer to Palatka than Jacksonville, it is still the opinion of the ESE staff that the data gathered in Jacksonville is more appropriate to the Palatka area than the Daytona Beach data. The reason is simple, a quick glance at a good map of Florida will show that the Jacksonville airport is at least ten miles further inland from the Atlantic Ocean than the Daytona Beach airport (the location of the Daytona Beach weather station). As this minimizes the localized "sea breeze" effect, it is felt that the Jacksonville meteorological data will more accurately reflect the Palatka area than the Daytona Beach data.

Sincerely,

ENVIRONMENTAL SCIENCE &
 ENGINEERING, INC.



Robert E. Holden
 Associate Engineer

REH:peg

ENVIRONMENTAL SCIENCES
 GEOLOGY
 TOXICOLOGY
 CHEMISTRY
 ANALYTICAL CHEMISTRY
 WATER QUALITY
 WASTEWATER TREATMENT
 AIR POLLUTION CONTROL
 SOIL CONSERVATION
 PLANT AND ANIMAL
 ECOLOGY
 ENVIRONMENTAL ECONOMICS

ENVIRONMENTAL ENGINEERING
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