FPL

P. O. Box 078768, West Palm Beach, FL 33407-0768
6001 Village Blvd.

July 14, 1989

Mr. Dale Twachtmann, Secretary
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32301-8241

Dear Mr. Twachtmann:

This correspondence is to certify that Dr. Martin A. Smith, Manager of Environmental Permitting and Programs in the Environmental Affairs Department of Florida Power & Light Company, is authorized to act as an agent and representative for Florida Power & Light Company in DER permit actions. Correspondence from DER to FPL, including inspection reports, notices of violation, requests for information, etc., can be addressed to Dr. Smith at the following address:

Dr. Martin A. Smith
Environmental Affairs Department
Florida Power & Light Company
P. O. Box 078768
West Palm Beach, Fl 33407-0768
(407) 640-2030

Sincerely,

J. S. Odom
Vice President

JSO:eh

cc: Ernest Frey - DER Northeast District
Alexander - DER Central District
Scott Benyon - DER Southeast District
Richard Garrity - DER Southwest District
Philip Edwards - DER South District

HOPPING BOYD GREEN & SAMS
ATTORNEYS AND COUNSELORS
123 SOUTH CALHOUN STREET
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500
FAX (904) 224-8551

CARLOS ALVAREZ
JAMES S. ALVES
BRIAN H. BIBEAU
ELIZABETH C. BOWMAN
WILLIAM L. BOYD, IV
RICHARD S. BRIGHTMAN
PETER C. CUNNINGHAM
WILLIAM H. GREEN
WADE L. HOPPING
FRANK E. MATTHEWS
RICHARD D. MELSON
WILLIAM D. PRESTON
CAROLYN S. RAEPPLE
GARY P. SAMS
ROBERT P. SMITH, JR.

KATHLEEN BLIZZARD
THOMAS M. DEROSE
RICHARD W. MOORE
DIANA M. PARKER
LAURA BOYD PEARCE
MICHAEL P. PETROVICH
DAVID L. POWELL
DOUGLAS S. ROBERTS
CECELIA C. SMITH
SAM J. SMITH
CHERYL G. STUART

OF COUNSEL
W. ROBERT FOKES

May 22, 1990

Dale S. Twachtmann
Secretary, Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Petition for Test Approval/Florida Power & Light Company, Sanford Unit #4/PSD Permit Application Form

Dear Secretary Twachtmann:

On April 3, 1990, we filed a Petition for Authorization to Conduct Testing and Research at Florida Power & Light Company's (FPL) Sanford Unit #4. The proposed short-term testing will allow FPL to determine the engineering, economic, and environmental feasibility of adding a new fuel to the Company's fuel base. In addition to determining the air emission characteristics associated with combustion of the fuel, as part of the test, FPL proposes to test various pollution control methodologies. The overall goals of the test program are to lead to reduced emissions, less expensive fuel, and an expansion of Florida's fuel base.

Since filing the initial petition, FPL has been informally advised that the petition needs to be supplemented with a completed Prevention of Significant Deterioration (PSD) permit application form. Please find attached a completed DER Form 17-1.202(1). You will note that the application form has Attachments "A", "B", "C", and "D". These attachments are reproductions of the same materials that were appended to the petition for test approval referenced above.

We look forward to working with your staff to facilitate their expeditious review of the test proposal and associated PSD permit application. The test rule and related State Implementation Plan revision will necessitate the holding of

a public hearing by the Department with at least thirty days' prior newspaper notice. We are hopeful that this public hearing can be held during the month of July.

Thank you for your continued cooperation and assistance in this matter.

Respectfully submitted,

Bill

William H. Green

WHG/wrn

cc: Steve Smallwood, DER, w/enc.
Clair Fancy, DER, w/enc.
Cindy Phillips, DER, w/enc.
Winston A. Smith, EPA, w/enc.
Martin A. Smith, FPL, w/enc.

2.4 PILOT TESTING SOLID WASTE MANAGEMENT

The Sanford Unit 4 Orimulsion test burn will also provide the raw data necessary to meet the following important objectives relating to solid waste handling:

1. Characterization of the chemical and physical properties of the solid wastes for use as input in the design of full-scale waste handling systems.
2. Evaluation of the methods and equipment used to manage the solid wastes during the test burn.

Two types of solid waste will be generated during the test burn--Orimulsion fly ash and lime spray dryer solid waste. The spray dryer waste will be composed of the fly ash mixed together with calcium sulfite, calcium sulfate, and unreacted lime.

A vacuum, dilute pneumatic system will be utilized during the test burn to transfer solid waste from the particulate collectors (pilot-scale fabric filters and electrostatic precipitator) and the spray dryer to a temporary storage silo. Samples of the ash from the particulate collectors will be analyzed to determine metals content for possible sale of recovered metals. Samples of the spray dryer waste will be studied for stability as part of an ongoing laboratory analysis program sponsored by FPL in cooperation with the Florida Institute of Technology.

Due to the small volume of solid waste generated during the test, wastes may be transported off-site for ultimate disposal at a facility acceptable to FDER. The quantity of fly ash that will be generated is estimated at approximately 3,600 lb. Total waste generated from the spray dryer will be about 16,000 lb.

A second alternative for management of test burn solid wastes is disposal on-site utilizing a landfill with an impermeable liner. This approach would involve a relatively small area, approximately 10 feet (ft) x 10 ft x 5 ft high. Provision would be made for groundwater monitoring and leachate

control, with routing of runoff to the existing plant ash settling basins. The on-site disposal alternative would be equivalent to a "test-cell" and could be used to evaluate landfill design prior to planning for a permanent conversion.

Neither of these alternatives for the test burn would necessitate a change to the power plant's existing state and federal wastewater permit discharge limits.

2.5 SCHEDULE

Figure 2-2 presents a conceptual testing schedule. The actual schedule of testing will probably be affected by early test results, unit reliability, system power requirements, etc. The test program is assumed to start in November or December 1990. Startup tests will proceed parallel with the final phases of construction. Initial startup after the modifications will be on oil. Boiler and balance of plant performance will be tested to develop baseline operations.

The period of oil-fired testing will be followed by initial firing of Orimulsion fuel and initial characterization tests. During this period, optimum settings will be determined, and the plant staff will become familiar with Orimulsion operation. The minimum and maximum limits of Orimulsion firing as a function of unit output and load change rates will be investigated.

After stable operation on Orimulsion has been achieved, boiler and balance of plant structured testing will be performed. This test series will measure Orimulsion performance in a relatively clean boiler. An outage will be scheduled after this test series on Orimulsion to allow inspection, adjustment, or repair of plant components, test equipment, and instruments.

Periods of sustained low load and high load operation will be scheduled early in the test program to identify operating problems before the unit has to be restored to commercial operation. Outages after each period will

ORIMULSION is an emulsion of ORINOCO in water, stabilised by an especially formulated additive. ORIMULSION characteristics are such that it can be handled in a similar way as conventional liquid fuels.

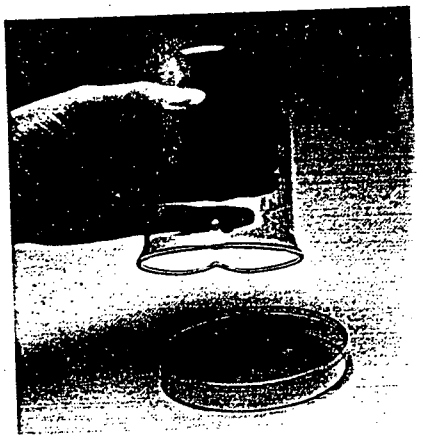
ORIMULSION CHARACTERISTICS

	RANGE
Orinoco content, % w/w	72±2
Water content, % w/w	28±2
Mean droplet size, μm	17±3
For ORIMULSION with 71% ORINOCO	
Dynamic viscosity (100 s^{-1}), mPas	
at 20°C	800-1200
at 50°C	400-600
Gross heat of combustion, Kcal/Kg	7.0×10^3-7.5×10^3
Elemental Analysis, % w/w	
Carbon	59.0-61.0
Hydrogen	7.0-7.7
Sulphur	2.1-2.7
Nitrogen	0.43-0.58
Oxygen	0.43-0.60
Ash	0.06-0.11
Metal Content, ppm	
Vanadium	280-350
Nickel	57-80
Iron	7-17
Sodium	40-70
Conradson Carbon, % w/w	10-13
Flash Point, °C	120 min.
Pour Point, °C	2

ORINOCO* is the natural hydrocarbon produced from the Orinoco Belt. Due to its high viscosity and low gravity, it is a non oil hydrocarbon which has been classified as a natural bitumen.

ORINOCO CHARACTERISTICS

	RANGE
Gravity °API	7.5 – 9.5
Water content, % w/w (after treatment)	$\leq$ 1%
Viscosity, mPas	
at 25°C	$1 \times 10^5 - 8 \times 10^5$
at 50°C	$6 \times 10^3 - 4 \times 10^4$
Gross heat of combustion, Kcal/Kg	$9.5 \times 10^3 - 10 \times 10^3$
Elemental Analysis, % w/w	
Carbon	84.0 – 86.0
Hydrogen	9.8 – 10.8
Sulphur	3.0 – 3.8
Nitrogen	0.6 – 0.8
Oxygen	0.6 – 0.85
Ash	0.08 – 0.15
Metal content, ppm	
Vanadium	400 – 500
Nickel	80 – 110
Iron	10 – 20
Sodium (after treatment)	60 – 120
Conradson Carbon, % w/w	16.0 – 18.0
Flash Point, °C	120 min.
Pour Point, °C	10



STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

#5,000 fd. 5-22-90 Receipt # 151127

RECEIVED

MAY 22 1990

DER - BAQM

PSD-FL-150
AC 64-180842

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Fossil Fuel Steam Generator [ ] New[1] [X] Existing[1] Orimulsion Test Burn

APPLICATION TYPE: [X] Construction [X] Operation [ ] Modification See Note a Below

COMPANY NAME: Florida Power & Light Company COUNTY: Volusia

Identify the specific emission point source(s) addressed in this application (i.e., Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Sanford Unit 4 - 400 MW class unit

SOURCE LOCATION: Street Lake Monroe off Highway 17-92 City Sanford

UTM: East 17-468.3 North 3190.3

Latitude 28 ° 50 ' 31 "N Longitude 81 ° 19 ' 32 "W

APPLICANT NAME AND TITLE: Martin A. Smith, Ph.D., Mgr. Environmental Permitting & Programs

APPLICANT ADDRESS: P.O. Box 078768, West Palm Beach, FL 33407-0768

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Florida Power & Light Company

I certify that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: Martin A. Smith

Martin A. Smith, Ph.D. Mgr., Env. Permitting & Programs
Name and Title (Please Type)

Date: 5/21/90 Telephone No. (407) 640-2030

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been ~~designed~~/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgement, that

[1]See Florida Administration Code Rule 17-2.100(57) and (104)
[a]Approval under the testing and research provisions of FDER Rule 17-103.120 would authorized FPL to both contruct and operate Unit 4 when firing Orimulsion fuel.

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. ~~It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.~~
(Source already operating)

Signed Kennard F. Kosky

Kennard F. Kosky
Name (Please Type)

KBN Engineering and Applied Sciences, Inc.
Company Name (Please Type)

1034 N.W. 57th Street, Gainesville, FL 32605
Mailing Address (Please Type)

Florida Registration No. 14996 Date: 5/21/90 Telephone No. (904) 331-9000

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

Perform test burn program of Orimulsion fuel. See Attachment A for further information.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction[b] July 1990 Completion of Construction[b] June 1992

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

Pilot testing of pollution control equipment will be performed. Cost of pilot equipment is estimated at $800,000. See Attachment A, Section 2.3.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

A064-132055 Issued 12/16/87 Expires 12/17/92

[b]Actual testing is scheduled to begin in November 1990 and will continue over a period of approximately 18 months. The time scheduled before and after the testing is required for pretest preparation and demobilization, respectively.

E. Requested permitted equipment operating time: hrs/day Variable; days/wk ____; wks/yr ____;
If power plant, hrs/yr a; if seasonal, describe: a. Up to 120 full-capacity equivalent burn days when Orimulsion fuel is fired. Refer to Section 2.5 in Attachment A.

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No
   a. If yes, has "offset" been applied? ____
   b. If yes, has "Lowest Achievable Emission Rate" been applied? ____
   c. If yes, list non-attainment pollutants. ____
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No- see Attachment B
3. Does the State "Prevention of Significant Deterioration" (PSD) requirement apply to this source? If yes, see Sections VI and VII. Yes-Increment Consumption see Attachment B
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No-see Attachment B
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No
   a. If yes, for what pollutants? ____
   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:
Not Applicable

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A

2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

See Attachment A; Tables 3-2, 3-3, and 3-4

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Multicyclones	Particulate	30.3%	<5 μm	Eng. Est.

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Orimulsion	Variable	311,538 lb/hour	4,050

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, others--lbs/hr.

Fuel Analysis: No. 6 Fuel oil

Percent Sulfur: 2.8 (maximum) Percent Ash: 0.21

Density: 8.4 lbs/gal Typical Percent Nitrogen: 0.5

Heat Capacity: 13,000 BTU/lb 109,200 BTU/gal

Other Fuel Contaminants (which may cause air pollution): see Section 3.0 in Attachment A

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average N/A Maximum

G. Indicate liquid or solid wastes generated and method of disposal.

See Section 2.4 of Attachment A.