

Final Determination

Florida Power & Light Company  
Orimulsion Test for Sanford Power Plant Unit 4  
Volusia County, Florida

Permit Number: PSD-FL-150  
AC64-180842

Facility ID # 1270009

Florida Department of Environmental Regulation  
Division of Air Resources Management  
Bureau of Air Regulation

October 2, 1990

## Final Determination

The Technical Evaluation and Preliminary Determination for Florida Power & Light Company to test Orimulsion fuel at Sanford Power Plant Unit 4 boiler in Volusia County, Florida, was distributed on August 3, 1990.

Copies of the evaluation were available for public inspection at the Department's offices in Orlando and Tallahassee, and at the Seminole County Public Library System North Branch in Sanford. Public notice of the Department's intent to revise the State Implementation Plan and issue a PSD permit in accordance with the request to conduct research and testing was published in newspapers of general circulation in the Sanford area and in the Florida Administrative Weekly between August 2 and 7, 1990. No petitions were filed. A public hearing was held in DeBary, Florida on September 6, 1990 to receive public comment. No public comment adverse to the project was made at the public hearing.

The U.S. EPA requested that a particulate matter full impact analysis be performed to determine if PSD increments or 24-hour Ambient Air Quality Standards would be violated. Based upon modeling performed by KBN, 17 percent of the current allowable 24-hour Class II PSD increment for PM-TSP will be consumed with the Orimulsion burn. The 24-hour PM<sub>10</sub> AAQS impacts account for 35 percent of the State of Florida AAQS standards. These impacts include an appropriate background concentration.

In a letter dated August 24, 1990, the applicant's attorney submitted minor revisions to incorporate information for an additional test of a larger, 20-foot baghouse. The Department accepted these revisions as this test should provide better data for FPL to use in evaluating the pollution control devices.

In a letter dated August 24, 1990, the applicant's attorney submitted FPL's comments concerning the draft permit. Following is a summary of the applicant's comments and the Department's response.

1. Comment: The applicant requested that the project description be changed to (1) revise descriptions for baghouse, (2) indicate SOXAL is not a pollution control device, and (3) show that the CEM for CO is at the economizer rather than at the stack.

Response: The Department has clarified the project description to reflect these comments.

2. Comment: The applicant requested that the temporary amendments to the permits for Units 3 and 5 be made in the final order rather than in Specific Condition No. 2 of the permit for Unit 4.

Response: The Department has included the amendments to the permits for Units 3 and 5 in the final order. Specific Condition No. 2 references these amendments which are made to the permits for Units 3 and 5.

3. Comment: The applicant requested that the words "for soot-blowing and load changes" be deleted from the excess emissions limitation of Specific Condition No. 3(a) as the definition of excess emissions also includes start-up, shutdown, and malfunction.

Response: The Department revised Specific Condition No. 3(a) to include startup, shutdown, and malfunction with a 2-hour limitation.

4. Comment: The applicant requested that Specific Condition 3(b) be deleted as particulate matter includes PM10.

Response: The Department deleted this condition as it was duplicative.

5. Comment: The applicant requested that the words "heat input" be added to Specific Condition 3(c) for clarification.

Response: The Department added this clarification.

6. Comment: The applicant requested that the words "for soot-blowing or load changes" be deleted from the excess emissions limitation of Specific Condition No. 3(d) as the definition of excess emissions also includes start-up, shutdown, and malfunction.

Response: The Department revised Specific Condition 3(d) to include startup, shutdown, and malfunction with a 2-hour limitation.

7. Comment: The applicant requested that the first steady-state particulate matter test be conducted within two weeks of startup of burning Orimulsion fuel rather than one week as stated in Specific Condition No. 5(a).

Response: The Department revised Specific Condition No. 5(a) to require the testing within 10 days of start-up rather than within one week to clarify the fact that FPL is to conduct testing after the unit has been firing Orimulsion for one week.

8. Comment: The applicant requested that Specific Condition 6(d) be revised to require the use of the EPA Draft Multimetals train for the testing of trace elements and metals rather than the EMTIC Interim Test Method recommended by EPA.

Response: After discussions with Paul Reineremann of EPA and Walter Smith of Entropy Environmentalists, Inc., the

Department revised Specific Condition 6(d) to require the EPA Draft Multimetals train for the testing of trace elements and metals.

9. Comment: The applicant requested that the Specific Condition 7(a) requirement for 15-day prior written notification of scheduled test dates be deleted. The applicant requested that verbal notification of changes to the scheduled test dates be given as soon as practicable due to the uncertain nature of testing circumstances.

Response: The Department's requirement of a 15-day prior written notification allows the District office the opportunity to schedule a compliance inspection during the compliance tests. This requirement was not deleted but the Specific Condition was modified to add that the Department shall be verbally notified of test cancellations as soon as possible, and compliance tests that have been cancelled verbally may be rescheduled to a time agreed to by the Department.

10. Comment: The applicant requested that the words "achievable when burning Orimulsion" be added on to the end of Specific Conditions 7(b) and 7(c) to clarify the fact that the unit might not achieve the same capacity with Orimulsion as it realizes with Oil.

Response: The Department revised Specific Conditions 7(b) and 7(c) by adding the words "achievable when burning Orimulsion" for clarification.

11. Comment: The applicant requested that the requirement for monthly pilot test stream reports be replaced by a requirement for a detailed report of the pilot pollution control equipment test results within ninety days after the permittee has notified the Department that the Orimulsion test burn has been completed.

Response: The Department decided that a complete report submitted at the end of the test project would be more practical than incomplete test reports submitted on a monthly basis.

12. Comment: The applicant requested that Specific Conditions 7(e)(v) and 7(e)(vi) be combined and edited for clarification.

Response: The Department revised these Conditions for clarification.

In a letter dated August 30, 1990, the U.S. EPA submitted comments concerning the draft permit. Following is a summary of those comments and the Department's response.

1. Comment: The SIP revision and Specific Condition 3 of the draft permit must explicitly state that the relaxed emission limits for SO<sub>2</sub> and opacity only apply during the firing of Orimulsion. The relaxed limit for particulate matter was approved in 1980 and is still in effect. The relaxed limits were approved due to the shortage of low-sulfur oil which existed at that time. Since this shortage no longer exists, the Region feels that the State of Florida should consider revocation of the variance and a return to the SIP limits for this unit once this test burn period has expired.

Response: The Department included in the Order for the proposed SIP revision, and in the permit specific conditions, the statement that the emission limiting standards shall apply while Unit No. 4 is firing Orimulsion fuel. In addition, a specific condition which states what emission limits apply while all other fuels are being fired was included in the permit for clarification. The Department will decide at a later date whether or not to revoke the existing particulate matter variance once the test burn period has expired. This action will not be included in the currently proposed SIP revision.

2. Comment: The SIP revision must reflect the SO<sub>2</sub> emission limitation of 1.1 lb SO<sub>2</sub> for Units 3 and 5 during the firing of Orimulsion as the ambient air modeling assumed this as the maximum for SO<sub>2</sub> emissions from those units. In addition, the draft construction permit in Specific Condition 2 states that Units 3 and 5 can only be fired with natural gas or fuel oil with one percent sulfur content (by weight) which is equivalent to 1.1 lb SO<sub>2</sub>/MMBtu.

Response: The Order for the proposed SIP revision states that Units Nos. 3 and 5 shall be fired only with natural gas and/or fuel oil with a sulfur content limit equivalent to 1.1 lb SO<sub>2</sub>/MMBtu. The amendments to the permits for Units 3 and 5 limit SO<sub>2</sub> emissions to 1.1 lb SO<sub>2</sub>/MMBtu.

3. Comment: Specific Condition 3 of the draft permit should include a NO<sub>x</sub> emission limit of 0.7 lb NO<sub>x</sub> (as NO<sub>2</sub>)/MMBtu in order to report the frequency of excess emissions as required by Specific Condition 7(e)vi. This recommended NO<sub>x</sub> emission limit was utilized by FPL in the document entitled "Description of Orimulsion Test Burn at FPL Sanford Unit 4." A CO emission limit of 0.03 lb CO/MMBtu should also be considered for the same reasons as the NO<sub>x</sub> limit.

Response: The Department has not included NO<sub>x</sub> or CO emission limitations in the permit. Unit 4 currently has no emission limitations for NO<sub>x</sub> and CO and the Department does not consider them necessary for this temporary project. FPL is required to continuously monitor NO<sub>x</sub> and CO emissions to gather research data.

4. Comment: If the emission limits recommended in comment 3 above are not incorporated into the final permit, then a requirement to report all hourly averages of NO<sub>x</sub> and CO CEM data should be incorporated into Specific Condition 7(e) of the draft permit.

Response: The Department included language in Specific Condition 5.b) to require the NO<sub>x</sub> and CO CEM data to be averaged hourly, recorded and maintained. Specific Condition 8.e)iv. requires a monthly summary of the hourly averages of NO<sub>x</sub> and CO CEM data to be submitted to the Department.

5. Comment: Calibration and maintenance of the CEMs should be required. These CEMs should be required to be evaluated by the respective Performance Specification Test of 40 CFR Part 60, Appendix B.

Response: The Department included Specific Condition 5c) which states that the CEMs shall be maintained, calibrated, and evaluated by the respective Performance Specification Test of 40 CFR Part 60, Appendix B.

6. Comment: A requirement for fuel sampling and analysis of the fuel oil to be burned in Units 3 and 5 should be specified in Specific Condition 4 and the procedures in Method 19 of 40 CFR Part 60, Appendix A should be followed.

Response: The Department included Specific Condition 7.e) which requires that Orimulsion fuel be sampled and analyzed for percent sulfur content (by weight) once per month. Rather than Method 19, the Department approved ASTM method of analysis shall be used.

7. Comment: Specific Condition 5 should state that the average of three tests runs will be used to determine compliance.

Response: To Specific Conditions 6a) & 6b), the Department added "For each 3-run test, the average result of the three one-hour runs shall be used to determine compliance."

8. Comment: In Specific Condition 6, tests for CO by Method 10 should be specified. If CO and NO<sub>x</sub> limits are established (see Comment 3), the recommended CO test and NO<sub>x</sub> test requirements should be part of Specific Condition 5.

Response: The Department did not require CO and NO<sub>x</sub> emission limitations. Research emission data is to be acquired by use of CEMs.

9. Comment: Instead of utilizing both Method 101 and the EMTIC metals test procedures for trace elements and metals (Specific Condition 6(d)), a single test procedure, the Multiple Metals Train developed for RCRA could be utilized.

Response: The Department incorporated the test method change into Specific Condition 7.d).

10. Comment: In Specific Condition 7(e)vi, a time period for averaging CEM data to report exceedances should be specified. Exceedances for opacity should be any 6 minute average above the opacity limit and for SO<sub>2</sub>, any hourly average above the SO<sub>2</sub> limit.

Response: The Department revised Specific Condition 8.e)vi. to state that exceedances for opacity shall be any 6-minute average above the opacity limit and for SO<sub>2</sub>, any hourly average above the SO<sub>2</sub> limit.

In a letter dated September 5, 1990, the applicant's attorney submitted FPL's additional comments concerning the draft permit. Following is a list of the applicant's comments and the Department's response.

1. Comment: FPL requested that Specific Condition No. 2 wording be revised to restrict Units 3 and 5 to be fired with natural gas and/or fuel oil with a sulfur content limit equivalent to 1.1 lb SO<sub>2</sub>/MMBtu, rather than with a one percent sulfur content (by weight) or less.

Response: As the intent of the restriction on Units 3 and 5 is to limit the emissions to 1.1 lbs SO<sub>2</sub>/MMBtu, the Department revised Specific Condition 2 to clarify this.

2. Comment: FPL requested that Specific Condition Nos. 3(a) and 3(c) be changed to eliminate the excess emission limitations for startup, shutdown and malfunction. FPL requested that the requirements of Rule 17-2.250(1) and (2), F.A.C. suffice.

Response: Rules 17-2.250(2) and (3), F.A.C. are intended for existing fossil fuel steam generators with proven operating practices during startup, shutdown, and malfunction. The use of an experimental fuel at Unit 4 involves unproven operating practices and can not be considered a best operating practice. The Department revised Specific Conditions 3a) and 3c) to allow excess emissions of 3 hours for startup and shutdown, rather than two hours, as the air impact modeling was performed based upon excess emissions of 3 hours per 24-hour period. No other change was made to these conditions.

3. Comment: FPL requested that the words startup and shutdown be removed from Specific Condition 4.d) as startup and shutdown are not limited to 2 hours.

Response: The Department eliminated the words startup and shutdown to be consistent with Unit No. 4's current operating permit.

4. Comment: FPL requested that the stack emission test results be submitted no later than 45 days after the last run when a 3-run test is completed, but that the stack test emission results not be included in every monthly report.

Response: The Department deleted the requirement for copies of the stack test emission results to be included in each monthly report.

In a letter dated September 7, 1990, the applicant's attorney submitted additional comments concerning the draft permit. FPL again requested that excess emissions from malfunctions have no emission limitation and that excess emissions from startup and shutdown have no time limitation or emission limitation. As the air impact modeling was based on time and emission limitations and, as the public was told these limitations would be in the permit, the excess emission limitations were not changed.

In a letter dated September 21, 1990, the applicant's attorney informed the Department that FP&L had recommended that the pilot-scale lime spray dryer and accompanying fabric filter be eliminated from the test because it could be designed on the basis of data obtained from coal-fired units.

However, in their petition for authorization to conduct testing and research, FP&L stated that performance information must be generated through a demonstration test burn of Orimulsion in order to enable proper design and sizing of necessary sulfur dioxide control equipment such as spray dryers and particulate control systems such as baghouses or precipitators. Therefore, as FP&L reversed their decision that a spray dryer could only be properly designed by the testing Orimulsion, the Department requested to know why the burning of Orimulsion was still necessary to test the other pilot-scale pollution control equipment.

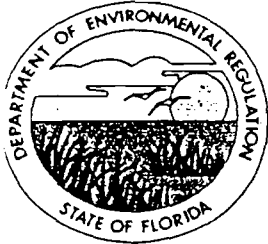
FP&L responded by saying that no one has tested the ability of baghouses to remove the very fine particulate matter anticipated to be produced from the combustion of Orimulsion. That is why FP&L proposed extensive testing of baghouse fabric materials to determine whether the collected particulate matter will cause that material to become blinded and ineffective, and also to determine whether pressure drops created by collected particulate matter will be tolerable.

The reasons that the testing of the spray dryer is no longer necessary are that since FP&L petitioned for testing, the Florida Institute of Technology has successfully determined the stability characteristics of the dryer-generated waste in the laboratory and the Electric Power Research Institute has confirmed that spray dryer technology can be scaled up from recent high sulfur fuel test data.

The Department accepted this explanation and agreed to the removal of the spray dryer and associated baghouse from testing.



The Final Action of the Department will be to issue the permit to construct as proposed in the Technical Evaluation and Preliminary Determination except for the changes discussed above. The Permit will not constitute a federal PSD permit until such time as the proposed revision of the State Implementation Plan (SIP) is authorized by the U.S. EPA. Any construction undertaken by the permittee prior to the approval of the proposed SIP revision is understood to be at the exclusive financial risk of the permittee. No Orimulsion fuel shall be fired until the permittee receives written notice from the Department that the SIP has been approved to allow the firing of Orimulsion fuel.



# Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Bob Martinez, Governor

Dale Twachmann, Secretary

John Shearer, Assistant Secretary

PERMITTEE:  
Fla. Power & Light Co.  
P. O. Box 078768  
West Palm Beach, FL 33407-0768

Permit Number: AC 64-180842  
PSD-FL-150  
Expiration Date: June 30, 1992  
County: Volusia  
Latitude/Longitude: 28°50'31"N  
81°19'32"W  
Project: Orimulsion Fuel  
Test Burn

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the construction of test equipment and modification of existing equipment at Sanford Power Plant's Unit 4 in order to burn Orimulsion fuel up to 120 full-capacity equivalent burn days during an 18-month period for the purpose of research and testing. The research program will consist of boiler performance testing and testing of certain experimental pilot-scale pollution control equipment in slipstreams numbered 1 and 2.

The 1 MWe Slipstream 1 emissions control research equipment will consist of a precoating system, a high volume/low pressure (HVLP) pulse-jet fabric filter baghouse for particulate matter and a booster fan. The baghouse is rated for approximately 5,000 ACFM at an air-to-cloth ratio of 4 ft/sec.

The 2.5-5 MWe Slipstream 2 emissions control research equipment will consist of a reverse air/sonic fabric filter baghouse for particulate matter, a vertical-packed alkali scrubber for sulfur dioxide, and a booster fan. The baghouse is rated for 14,400 ACFM and the packed scrubber is rated for 10,800 ACFM.

The pilot-scale SOXAL regeneration system will consist of an alkali sorbent regenerator, a regenerated sorbent tank, a spent sorbent tank, and a steam stripper.

Emissions from the side streams will exhaust through the Unit 4 stack, which will be equipped with continuous opacity, nitrogen oxides (NO<sub>x</sub>), and SO<sub>2</sub> monitors. A continuous carbon monoxide (CO) monitor will be located at the economizer outlet.

Side stream 2 will be equipped with SO<sub>2</sub> monitors and side streams 1 and 2 will be sampled for particulate matter to gather research data.

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The UTM coordinates are 17-468.3 km East and 3190.3 km North. The unit is located at Lake Monroe off U.S. Highway 17-92.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

The documents listed below are available from the Department upon request:

1. FP&L's petition received April 2, 1990.
2. EPA's letter dated May 22, 1990.
3. FP&L's application received May 22, 1990.
4. William Green's letter dated June 13, 1990.
5. DER's letter dated June 20, 1990.
6. DER's letter dated June 21, 1990.
7. FP&L's additional information received June 25, 1990.
8. EPA's letter dated June 26, 1990.
9. DER's letter dated June 28, 1990.
10. EPA's letter dated July 2, 1990.
11. FP&L's additional information received July 11, 1990.
12. FP&L's additional information received July 16, 1990.
13. FP&L's additional information received July 20, 1990.
14. FP&L's additional information received August 1, 1990.
15. DER's Technical Evaluation, Preliminary Determination and draft permit dated August 2, 1990.
16. William Green's letter received August 24, 1990, concerning draft permit.
17. William Green's letter received August 24, 1990, concerning revised attachments.
18. EPA's letter dated August 30, 1990.
19. Second Draft Permit (8/31/90).
20. KBN's letter dated September 4, 1990.
21. William Green's letter dated September 5, 1990, concerning EPA's comments.
22. William Green's letter dated September 5, 1990, concerning second draft permit.
23. Third Draft Permit (9/5/90).
24. FP&L information provided at Public Hearing entitled "Answers to questions about FP&L's plan to burn a new fuel at the Sanford Plant."
25. FP&L presentation at Public Hearing.
26. William Green's letter dated September 7, 1990, concerning third draft permit.
27. DER's response to William Green dated September 13, 1990.
28. DER's letter to EPA dated September 13, 1990.
29. EPA's response to DER dated September 14, 1990.
30. William Green's letter dated September 21, 1990.
31. DER's response to William Green dated September 26, 1990.
32. William Green's letter dated September 28, 1990.

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**GENERAL CONDITIONS:**

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.
4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.
6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

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7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

- a. Have access to and copy any records that must be kept under the conditions of the permit;
- b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

- a. a description of and cause of non-compliance; and
- b. the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance,

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provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance

records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

14. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were

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incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

15. This permit also constitutes Determination of Prevention of Significant Deterioration (PSD).

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SPECIFIC CONDITIONS:

1. Heat Input Rate:

The permitted heat input rate for this source is 4,050 MMBtu/hr.

2. Permitted Fuels:

Unit 4 shall be fired with Orimulsion Fuel, No. 6 Residual Oil, No. 2 Fuel Oil, or Natural Gas only. By separate permit amendments, the Department has temporarily restricted Units 3 and 5 to be fired only with Natural Gas and/or Fuel Oil with a sulfur content limit equivalent to 1.1 lb SO<sub>2</sub>/MMBtu.

3. Source Emission Limiting Standards for Unit No. 4 While Firing Orimulsion Fuel:

a) Particulate Matter: Steady-state - 0.3 lb/MMBtu; Excess emissions, not to exceed 3 hours per 24-hour period, for soot-blowing, startup, shutdown and load changes - 0.6 lb/MMBtu; Excess emissions, not to exceed 2 hours per 24-hour period for malfunction - 0.6 lb/MMBtu.

b) Sulfur Dioxide: 4.3 lb/MMBtu heat input.

c) Visible Emissions: Steady-state - 60% opacity; Excess emissions, not to exceed 3 hours per 24-hour period, for soot-blowing, startup, shutdown and load changes - 100% opacity; Excess emissions, not to exceed 2 hours per 24-hour period, for malfunction - 100% opacity.

4. Source Emission Limiting Standards while Firing No. 6 Residual Oil, No. 2 Fuel Oil, and/or Natural Gas:

a) Particulate Matter: Steady-state - 0.1 lb/MMBtu; Excess emissions, not to exceed 3 hours per 24-hour period, for soot-blowing and load changes - 0.3 lb/MMBtu.

b) Sulfur Dioxide: 2.75 lb/MMBtu heat input.

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- c) Visible Emissions: Steady-state - 40% opacity; Excess emissions not to exceed 3 hours per 24-hour period, for soot-blowing and load changes - 60% opacity.
- d) Excess emissions resulting from malfunction shall be allowed providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24-hour period unless specifically authorized by the Department for a longer duration.
- e) Excess emissions resulting from startup or shutdown shall be permitted provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions shall be minimized.

5. Source Emissions Monitoring:

- a) Continuous emission monitors (CEMs) for emissions of carbon monoxide (CO), nitrogen oxide (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>) and opacity shall be operating at the start-up of burning Orimulsion fuel and shall remain in operation throughout the duration of this permit regardless of what type of fuel is being burned.
- b) The CO, NO<sub>x</sub>, and SO<sub>2</sub> CEM data shall be averaged hourly. Opacity CEM data shall be averaged every six minutes. This data shall be recorded and retained.
- c) The CEMs shall be maintained, calibrated, and evaluated by the respective Performance Specification Test of 40 CFR Part 60, Appendix B.

6. Compliance Stack Test Requirements:

- a) Particulate Matter: EPA Test Method 5 or 17 (40 CFR 60 Appendix A; July 1989 version) shall be used to conduct eight 3-run steady-state tests and two 3-run soot-blowing tests. The first steady-state test shall be conducted within ten days of start-up of burning Orimulsion Fuel. For each 3-run test, the average result of the three one-hour runs shall be used to determine compliance.
- b) Sulfur Dioxide: EPA Test Method 6C (40 CFR 60, Appendix A; July 1989 version) shall be used to conduct eight 3-run steady-state tests and two 3-run soot-blowing tests. For each 3-run test, the average result of the three one-hour runs shall be used to determine compliance.



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- c) Visible Emissions: Opacity CEM with six minute averages.
7. Research Testing Requirements:
- a) Sulfuric Acid Mist: EPA Test Method 8 (40 CFR 60, Appendix A) shall be used to conduct one 3-run steady-state test.
- b) Nitrogen Oxides (NO<sub>x</sub>): EPA Test Method 7E (40 CFR 60, Appendix A) shall be used to conduct eight 3-run steady state tests and two 3-run soot-blowing tests.
- c) Volatile Organic Compounds (VOC): EPA Test Method 25A (40 CFR 60, Appendix A) shall be used to conduct eight 3-run steady-state tests and two 3-run soot-blowing tests.
- d) Trace elements and metals which shall include at least the following: mercury, vanadium, chromium, cadmium, arsenic, nickel, maganese, beryllium, copper, zinc, lead, selenium, phosphorous, thallium, silver, antimony, and barium. The EPA Draft Multimetals train shall be used to conduct one 3-run steady-state test for these elements and metals. A separate Method 5 train shall be used to test for vanadium pentoxide using the analysis method described in the NIOSH Manual of Analytical Methods.
- e) Orimulsion fuel shall be sampled and analyzed for percent sulfur content (by weight) once per month and as received per tanker. The Department approved ASTM method of analysis shall be used.
8. Testing Related Requirements:
- a) Written notification of compliance test dates shall be given to the Department's Central District and the Bureau Air Regulation at least 15 days prior to testing. The Department shall be verbally notified of test cancellations as soon as possible. Compliance tests that have been cancelled may be verbally rescheduled to a time agreed to by the Department.
- b) Testing of trace elements, metals, and sulfuric acid mist shall be conducted with the source operating within 90-100% of its full capacity achievable when burning Orimulsion fuel.
- c) At least one 3-run test for particulate matter, sulfur dioxide, nitrogen oxides, and volatile organic compounds shall be conducted with the source operating within 90-100% of its full capacity achievable when burning Orimulsion fuel.

PERMITTEE:  
Fla. Power & Light Co.

Permit No. AC 64-180842  
PSD-FL-150  
Expiration Date: June 30, 1992

**SPECIFIC CONDITIONS:**

- d) The stack sampling facility must comply with Rule 17-2.700(4), F.A.C.
- e) Results obtained from the test burn shall be reported monthly to the Department. The monthly reports shall include but not be limited to:
  - i. Orimulsion and any other fuel usage (recorded in barrels, MMBtu, and schedule of days burned),
  - ii. Number of full power test day equivalents during the month,
  - iii. Characteristics of Orimulsion and any other fuel used during the month (percent sulfur, heating value, and percent ash). This includes fuel used for Units 3 and 5,
  - iv. A monthly summary of the hourly averages of NO<sub>x</sub> and CO CEM data,
  - v. A monthly summary of opacity readings, including a daily log of excess opacity emissions, and
  - vi. Frequency of excess emissions. Exceedances for opacity shall be any 6-minute average above the opacity limit and for SO<sub>2</sub>, any hourly average above the SO<sub>2</sub> limit.

Monthly reports shall be submitted to the Bureau of Air Regulation and the Central District office within 21 days following the end of the month.

- f) A copy of the stack emission test results shall be submitted no later than 45 days after the last run when a 3-run test is completed.
- g) A detailed report of the pilot pollution control equipment test results shall be submitted within ninety days after permittee has notified the Department that the Orimulsion test burns have been completed. The report shall include an ultimate analysis of the Orimulsion fuel.

9. Other Requirements:

The permit holder may also need to comply with county, municipal, federal, or other state regulations prior to construction.

PERMITTEE:  
Fla. Power & Light Co.

Permit No. AC 64-180842  
PSD-FL-150  
Expiration Date: June 30, 1992

SPECIFIC CONDITIONS:

10. Test Length:

The testing of Orimulsion fuel shall be allowed for 90 full-capacity equivalent burn days. With permission from the Department, an additional 30 full-capacity equivalent burn days may be allowed to complete testing if necessary.

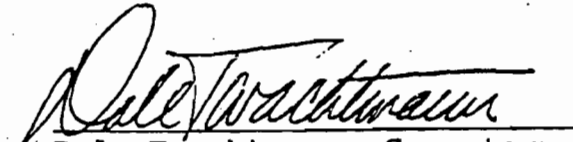
11. Permit Renewal:

While effective, this permit supercedes existing permit No. AO 64-132055. This permit shall expire on June 30, 1992, or at the end of the Orimulsion test burn project, whichever comes first. This permit shall not be renewed or extended. When it expires only permit AO 64-132055 shall be effective.

12. By accepting this permit, the permittee recognizes that it does not constitute a federal PSD permit until such time as the proposed revision of the State Implementation Plan (SIP) is approved by the U.S. EPA. Any construction undertaken by the permittee prior to the approval of the proposed SIP revision is understood to be at the exclusive financial risk of the permittee. No Orimulsion fuel shall be fired until the permittee receives written notice from the Division of Air Resources Management that the SIP has been revised to allow the firing of Orimulsion fuel.

Issued this 4<sup>th</sup> day  
of October, 1990

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL REGULATION

  
Dale Twachtman, Secretary

8/1/97 Sanford Visit by Martin Costello & Gary Kurbenki

Fuel by barge from JAX, Fuel Analysis:

15,000 bbl barge — get ~ 11,000 bbls  
due to river height

CO fire: screen in control room since gas is:

~ 30% GAS, Assume  $< 31.5$  F.O., will  
insure  $< 2.75$  #/MMBTU

U3: B&W Balanced Draft



→ physically only able to feed ~ 400 MW of Nat. Gas to plant  
so can't fire all boilers on 100% gas

10 to 15 Drums

gather 10 or 15 drums, analyze, if ok, blend into day  
tank

— All ~~from~~ lubricating oils & hydraulic oils — little  
gulfcrest 32 — used in hydraulic couplings — torque converters

U3: GAS recirculation<sup>n</sup> used @ SU for temp ↑ shut off @ load  
to above

can cool super/reheat tubes by internal water spraying

front wall fired

U4 & 5 Foster Wheeler 1/2 size of mamatee

only U4 steam atomization, then mechanical atomizer

10/4/90

BEFORE THE STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the matter of:

Petition for Authorization to  
Conduct Testing and Research;  
Florida Power & Light Company

---

ORDER AUTHORIZING RESEARCH AND TESTING

By Petition filed April 2, 1990, Florida Power & Light Company (FPL) seeks authorization pursuant to Section 403.061(18), Florida Statutes, and Rule 17-103.120, Florida Administrative Code, to conduct testing and research and to temporarily exceed limitations of the State Implementation Plan (SIP), Chapter 17-2, Florida Administrative Code, and Air Operating Permit No. A064-132055.

FINDINGS OF FACT

1. FPL proposes to test the performance of "Orimulsion", an emulsified fuel produced from a naturally occurring Venezuelan bitumen, in its Sanford Unit No. 4 Power Boiler. The proposed test location is at FPL's Sanford plant on U.S. Highway 17-92 between Sanford and DeBary, Florida. FPL seeks to conduct the test burn of Orimulsion in its Sanford Unit No. 4 Power Boiler for 120 full-power burn days equivalent. FPL requests an 18 month test period beginning on the first test burn day.

2. A Canadian test of Orimulsion indicates that the stability and combustion characteristics make the fuel suitable

for power generation. However, the design differences between the Canadian 100 megawatt corner-fired unit and FPL's Standard 400 megawatt front-wall fired unit necessitate additional testing. Further, information is lacking on the performance of available technologies for removing particulate matter and sulfur dioxide emissions from the firing of emulsified products such as Orimulsion. Thus, performance information must be generated through a demonstration test burn in order to enable proper design and sizing of necessary pollution control equipment that FPL will install if it commits to, and obtains approval for, permanent power generation using Orimulsion.

3. By switching from residual oil to Orimulsion, FPL seeks to substantially increase Florida's supply of readily available energy and reduce customers' energy costs.

4. On the basis of earlier test work, including the Canadian test, it is estimated that emissions from Sanford Unit No. 4 during the test burn would exceed currently permitted levels for sulfur dioxide, particulate matter, and opacity.

5. During the test period, FPL shall use only natural gas and/or fuel oil equivalent to 1.1 lb. SO<sub>2</sub>/MMBtu at Units Nos. 3 and 5 in order to partially offset the projected sulfur dioxide emissions increase at Unit No. 4.

6. Public notice of the Department's intent to revise the State Implementation Plan and issue a Prevention of Significant Deterioration (PSD) permit in accordance with the request to conduct research and testing was published in newspapers of general circulation in the Sanford area and in the Florida Administrative Weekly between August 2 and 7, 1990. No

petitions for a Section 120.57, Florida Statutes, hearing or motions for extension of time in which to file for a hearing were filed within 14 days of publication of notice.

7. In accordance with Rule 17-103.120(1)(b), Florida Administrative Code, and 40 CFR 51.102, a duly noticed public hearing was held in DeBary, Florida, on September 6, 1990, to receive public comment. State Representative Stan Bainter asked questions concerning potential effects of an Orimulsion spill, fuel processing and refining, wastewater, and long-term contracts for residual oil, which were responded to by FPL representatives. Brian Johnson, a resident of DeBary, Florida, commented favorably on the project. No other public comment was made at the public hearing.

8. The Department concurs and finds adequate FPL's comments of September 5, 1990, attached to this Order, in response to EPA's letter dated August 30, 1990. The Department also concurs with FPL's responses to Rep. Stan Bainter's questions pertaining to Orimulsion fuel processing and refining.

9. Modeling performed by FPL indicates that granting the requested relief from current emission limits will not jeopardize compliance with state and federal ambient air quality standards and applicable PSD increments, and will not interfere with attainment of ambient air quality standards in nonattainment areas. To ensure compliance with interim requirements, a comprehensive environmental monitoring program has been proposed, including emissions and ambient air quality monitoring to be performed by FPL.

10. There are no standards of performance for new sources contained in 40 C.F.R. Part 60 or National Emissions Standards for Hazardous Air Pollutants contained in 40 C.F.R. Part 61 which apply to the facility. Because the boiler as originally constructed can accommodate Orimulsion with only minimal changes to the burners, the proposed test will not trigger the application of New Source Performance Standards (NSPS) to the boiler emissions, and there is no requirement that Best Available Control Technology (BACT) be applied.

#### CONCLUSIONS OF LAW

1. The relief requested is within the scope of Section 403.061(18), Florida Statutes, and Rule 17-103.120, Florida Administrative Code.

2. Pursuant to Rule 17-103.120, Florida Administrative Code, any condition contained in this Order which is different than any requirement established by rule, permit or certification condition, or Department order, shall be effective for no more than two years from the date of this Order.

#### ORDER

Having considered FPL's written request, the supporting documentation, the record of public hearing, and the foregoing findings of fact and conclusions of law, it is

ORDERED that:



A. FPL is authorized pursuant to Section 403.061(1E), Florida Statutes, and Rule 17-103.120, Florida Administrative Code, to conduct the above-referenced research and testing and to temporarily exceed emission limits in the SIP, Chapter 17-2, Florida Administrative Code, and Air Operating Permit No. A064-132055 for sulfur dioxide, particulate matter, and opacity. FPL shall comply with the following emission limiting standards for Sanford Unit No. 4 while firing Orimulsion fuel:

- (a) Particulate Matter: Steady-state - 0.3 lb/MMBtu; Excess emissions, not to exceed 3 hours per 24-hour period, for soot-blowing, startup, shutdown, and load changes - 0.6 lb/MMBtu; Excess emissions, not to exceed 2 hours per 24-hour period for malfunction - 0.6 lb/MMBtu.
- (b) Sulfur Dioxide: 4.3 lb/MMBtu heat input.
- (c) Visible Emissions: Steady-state - 60% opacity; Excess emissions, not to exceed 3 hours per 24-hour period, for soot-blowing, startup, shutdown, and load changes - 100% opacity; Excess emissions, not to exceed 2 hours per 24-hour period, for malfunction - 100% opacity.

B. Sanford Unit No. 4 shall be fired with Orimulsion fuel, No. 6 Residual Oil, No.2 Fuel Oil, or natural gas only.

C. Sanford Unit Nos. 3 and 5 shall be fired with natural gas and/or fuel oil equivalent to 1.1 lb. SO<sub>2</sub>/MMBtu during the testing period. This temporary sulfur dioxide emissions restriction shall first apply when Orimulsion is initially burned in Unit No. 4. The restriction shall cease when FPL notifies the Department that the Orimulsion test has been completed, or within 18 months of the initial burning of Orimulsion, whichever shall occur first. The restriction shall

not apply during any period that Orimulsion burning is stopped for seven days or longer. The restriction shall be implemented by amendments to Air Operating Permits Nos. A064-131230 and A064-132060.

D. The research and testing ordered herein shall be conducted on FPL's Sanford Unit No. 4 Power Boiler. The research and testing shall be limited to 120 full-power burn days equivalent within the 18 month period beginning with the first orimulsion burn at Sanford No. 4.

E. FPL shall construct, perform monitoring, testing, and reporting in accordance with Air Construction Permit No. AC64-180842, to be separately issued for the testing and research ordered herein, and which modifies FPL's current operating permit for Sanford Unit No. 4, A064-132055.

F. FPL shall collect any solid wastes generated by the Orimulsion-related test burn equipment and dispose of it off-site at a landfill approved by the Department.

G. As portions of this Order constitute a relaxation of the SIP, the Order shall be submitted to the Environmental Protection Agency pursuant to Section 110 of the Clean Air Act.

H. None of the provisions of this Order relieve FPL of the responsibility to comply with all other applicable emission limiting standards or ambient air quality standards.

I. Any condition contained in this Order which is different than any requirement established by rule, permit or certification condition, or Department order, shall be effective for no more than two years from the date of this Order.

J. This Order shall not be renewed.

RIGHT TO APPEAL

Any party to this Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department of Environmental Regulation in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Notice of Agency Action is filed with the Clerk of the Department of Environmental Regulation.

DONE AND ORDERED this 4<sup>th</sup> day of October, 1990  
in Tallahassee, Florida.

FILING AND ACKNOWLEDGEMENT

FILED, on this date, pursuant to S120.52 Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

  
Clerk                      10-10-90  
Date

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL REGULATION



DALE H. TWACHTMANN  
Secretary  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida  
32399-2400

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this ORDER AUTHORIZING RESEARCH AND TESTING and all copies were mailed before the close of business on 10-10-90.

FILING AND ACKNOWLEDGEMENT  
FILED, on this date, pursuant  
to §120.52(9), Florida Statutes  
with the designated Department  
Clerk, receipt of which is  
hereby acknowledged.

Jane Jaber  
Clerk

10-10-90  
Date

Copies furnished to:

William Green, Esq.  
David Schwartz, Esq.  
Dan Thompson, Esq.  
Chuck Collins, CF District  
Tom Hansen, EPA  
Thomas Cloud, Esq.