

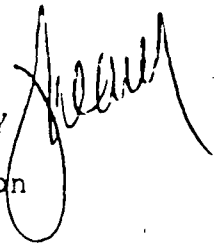


State of Florida  
DEPARTMENT OF ENVIRONMENTAL REGULATION

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# Interoffice Memorandum

TO: Steve Smallwood, Director DARM

FROM: John Shearer, Assistant Secretary 

RE: Hardee Power Station BACT Revision  
Case No. PA-89-25

DATE: August 10, 1990

On August 8, 1990, I met with representatives of Tampa Electric Company (TECO), TECO Power Services (TPS), and Seminole Electric Cooperative (SECT) to discuss revision of the Department's recommended BACT determination for NO<sub>x</sub> as issued June 14, 1990, for the TECO/SECI Hardee Power Station project, Case No. PA-89-25. Updated information presented to me by the applicant appears to substantiate that, at the cumulative capacity factors projected for the Hardee Power Station, a requirement for the installation of selective catalytic reduction (SCR) as BACT is not justified because of the excessive cost (between \$4500 and \$5600 per ton as compared to EPA's guidelines of \$3000 to \$4000 per ton) of NO<sub>x</sub> reduction with SCR at a cumulative capacity factor of 60%.

The applicant has committed to construct the duct module to accommodate later installation of SCR equipment if the Hardee Power Station operates at a cumulative capacity factor in excess of 60%. Should BACT be re-evaluated, selective catalytic reduction for NO<sub>x</sub> control will be required at a minimum for BACT.

Attached are amended conditions of certification which are necessary to implement the revised BACT determination for NO<sub>x</sub> to be made the subject of a formal stipulation at the Hardee Power Station certification hearing, August 13-17, 1990. Should the assumptions on costs, fuel usage, or other considerations that were used to arrive at this decision materially change, then the Department shall re-evaluate this determination.

Please direct that a revised BACT narrative incorporating the agreed conditions of certification be prepared for submission to the EPA.

JS/ht

## B. Identification of Permittees Responsible for Compliance

In general, where a specific condition is intended to apply solely to one of the Permittees, this shall be indicated in the title for that specific condition by the following abbreviations:

- TPS - TECO Power Services Corporation
- TEC - Tampa Electric Company
- SECI - Seminole Electric Cooperative, Inc.

Similarly, where a specific condition is intended to apply to any two of the Permittees, this shall be indicated by listing in the title the respective abbreviations. Where a specific condition is intended to apply to TPS, TEC, and SECI, the designation "HPS" (for "Hardee Power Station") shall appear.

## C. Applicable Rules

The construction and operation of the HPS shall be in accordance with all applicable provisions of at least the following regulations of the Department: Chapters 17-2, 17-3, 17-4, 17-5, 17-6, 17-7, 17-12, 17-21, 17-22, 17-25, 17-302, and 17-610, Florida Administrative Code (F.A.C.) or their successors as they are renumbered.

## II. AIR (TPS)

### A. Emission Limitations for HPS

The construction and operation of HPS shall be in accordance with all applicable provisions of Chapters 17-2, F.A.C.. In addition to the foregoing, HPS shall comply with the following conditions of certification as indicated.

1. On or before April 1 of each year, the Permittee shall submit to the Division of Air Resource Management and the Air Section, Southwest District Office, an annual report for the previous calendar year showing:

(a) The annual average capacity factor for each individual generating unit;

(b) The cumulative lifetime average capacity factor for each individual generating unit;

(c) The annual average capacity factor for the Hardee Power Station; and,

(d) The cumulative lifetime average capacity factor for the Hardee Power Station.

The annual average capacity factor shall be calculated by dividing each unit's megawatt hours output of generation by the product of the official megawatt rating of the unit and the number of hours in a year. Cumulative lifetime average capacity factor shall be calculated by dividing the cumulative total of megawatt hours output of generation by the product of the official combined cycle megawatt rating and the cumulative period of hours since commercial operation.

2. The Permittee shall install duct module(s) suitable for future installation of SCR equipment when constructing any combined cycle generating unit at the Hardee Power Station. Should any annual report demonstrate that the cumulative lifetime average capacity factor for the Hardee Power Station exceeds 60% at any time, the Permittee shall install SCR or another technology of equal or greater NOx reduction capability. In no event shall any such SCR or equivalent NOx control technology installation and compliance testing occur later than 30 months from the date that the permittee requested or the facility exceeded the 60% cumulative lifetime average capacity factor.

3. Only natural gas or No. 2 fuel oil shall be fired in the turbine.

4. The maximum heat input to each CT shall neither exceed 1268.4 MMBtu/hr while firing natural gas, nor 1312.3 MMBtu/hr while firing fuel oil (@32° F). Each CT's fuel consumption shall be continuously measured and recorded.

5. The maximum allowable emissions from each CT in accordance with the BACT determination, shall not exceed the following:

Pollutant	Fuel	Emission Limitations	
		concentration	lb/hr/CT
NOx	Gas	42 ppmvd @ 15% O <sub>2</sub>	215.9
	Oil	65 ppmvd "	383.8
VOC	Gas	2 ppmvd	3.6
	Oil	5 ppmvd	10.3
CO	Gas	10 ppmvd	31.3
	Oil	26 ppmvd	93.4
PM/PM10	Gas	--	5.0
	Oil	--	10.0
SO <sub>2</sub>	Gas	--	35.8
	Oil	0.3% S oil	734.4

6. The following emissions, most determined by BACT, are tabulated for PSD and inventory purposes:

Pollutant	Fuel	Emissions	
		concentration	lb/hr/CT
H <sub>2</sub> SO <sub>4</sub> Acid Mist	Gas	---	1.6
	Oil	---	22.0 (avg)/33.7 (max)
Mercury	Gas	---	0.0144
	Oil	---	0.0039
Fluoride	Oil	---	0.0427
Beryllium	Oil	---	0.0333

NOTE: Sulfur dioxide emissions assume a maximum of 0.5 percent sulfur in fuel oil for hourly emissions and an average sulfur content of 0.3 percent for annual emissions.

7. Visible emissions shall neither exceed 10% opacity while burning natural gas, nor 20% opacity while burning distillate oil.

8. Initial (I) compliance tests shall be performed on each Combustion Turbine using both fuels. The stack test for each turbine shall be performed within 10% of the maximum heat rate input for the tested operating temperature. Annual (A) compliance tests shall be performed on each Combustion Turbine with the fuel(s) used for more than 400 hours in the preceding 12-month period. Tests shall be conducted using EPA reference methods in accordance with the July 1, 1988 version of 40 CFR 60 Appendix A:

- a. 5 for PM (I,A)
- b. 8 for sulfuric acid mist (I, for oil only)
- c. 9 for VE (I,A)
- d. 10 for CO (I,A)
- e. 20 for NO<sub>x</sub> (I,A)
- f. 25A for VOC (I,A)
- g. 104 for Beryllium (I, for distillate oil only) A fuel analysis for Be using either Method 7090 or 7091, and sample extraction using Method 3040, as described in the EPA solid waste regulations SW 846, is also acceptable.
- h. ASTM D 2880-71 for sulfur content of distillate oil (I,A)
- i. ASTM D 1072-80, D 3031-81, D 4084-82 or D 3246-81 for sulfur content of natural gas (I, and A if deemed necessary by DER)

Other DER approved methods may be used for compliance testing after prior Departmental approval.

9. The average annual sulfur content of the No. 2 fuel oil shall not exceed 0.3% by weight. The maximum sulfur content of the No. 2 fuel oil shall not exceed 0.5%. Compliance shall be demonstrated in accordance with the requirements of 40 CFR 60.334 by testing all oil shipments for sulfur content using ASTM D 2880-71, and testing for nitrogen content.

10. For all generating units, water injection shall be utilized for NOx control. The water to fuel ratio at which compliance is achieved shall be incorporated into the permit and shall be continuously monitored for all units.

11. To determine compliance with the capacity factor condition, the permittee shall maintain daily records of power generation for each turbine. All records shall be maintained for a minimum of three years after the date of each record and shall be made available to representatives of the Department upon request.

12. The project shall comply with all the applicable requirements of Chapter 17-2, Florida Administrative Code (F.A.C.) and the July 1, 1988, version of 40 CFR 60 Subpart GG, Gas Turbines.

13. Any change in the method of operation, fuels, equipment, phase design, shall be submitted for approval to DER's Bureau of Air Regulation.

14. If start/black start capability for the CTs is provided by a combustion unit, the Department shall be notified of the type/model, output capacity, anticipated hours of operation, and air emissions of the unit.

15. The permittee shall have required sampling tests of the emissions performed within 60 days after achieving the maximum turbine firing rate, but not later than 180 days from the start of operation. Thirty (30) days prior notice of the initial sampling test and fifteen (15) days notice before subsequent annual testing shall be provided to the Southwest District Office. Written reports of the tests shall be submitted to the Southwest District office within 45 days of test completion.

16. If construction does not commence on the first three units within 18 months of issuance of this certification/permit, then the Permittee shall obtain from DER a review and, if necessary, a modification of the control technology and allowable emissions for the unit(s) on which construction has not commenced (40 CFR 52.21(r)(2)). Units to be constructed in later phases of the project will be reviewed and limitations established under the supplementary review process of the Power Plant Siting Act.

17. Quarterly excess emission reports, in accordance with the July 1, 1988 version 40 CFR 70.7 and 60.334, shall be submitted to DER's Southwest District office. Annual reports shall be

submitted to the District office in accordance with F.A.C. Rule 17-2.700(7).

18. Literature of equipment selected shall be submitted as it becomes available. A CT-specific graph of the relationship between NOx emissions and water injection, and also another of ambient temperature and heat inputs to the CT shall be submitted to DER's Southwest District office and the Bureau of Air Regulation.

19. Stack sampling facilities shall be provided for both the bypass stack (CT) and the main stack (HRSG).

20. Construction period fugitive dust emissions shall be minimized by covering or watering dust generation areas.

### III. SURFACE WATER DISCHARGES (TPS)

Discharges into surface waters of the state during construction and operation of the project shall be in accordance with applicable provisions of Chapters 17-3, 17-4, 17-302, 17-650, and 17-660, Florida Administrative Code, and the following conditions of certification.

#### A. Plant Effluents and Receiving Body of Water

For discharges made from the HPS the following conditions shall apply:

1. Receiving Body of Water (RBW) - The receiving body of water has been determined by the Department to be those waters of Payne Creek which are considered to be waters of the State within the definition of Chapter 403, Florida Statutes.

2. Point of Discharge (POD) - The point of discharge has been determined by the Department to be where the effluent physically enters the waters of the State in Payne Creek from either the storm water runoff retention pond or the cooling reservoir; however, compliance monitoring will be required at the cooling pond overflow weir and the stormwater detention pond discharge pipes.

3. Thermal Mixing Zones - The instantaneous zone of thermal mixing for the HPS cooling system shall not exceed a distance of 50 feet from the POD. The temperature at the POD into Payne Creek shall not be greater than 95 degrees F. The temperature of the water at the edge of the mixing zone shall not exceed the limitations of Section 17-302.520(5)(b), F.A.C..

4. Chemical Wastes from HPS - All discharges of low volume wastes (demineralizer regeneration, floor drainage, labs drains, and similar wastes) shall be treated in an adequately