



## FINAL DETERMINATION

Gulf Power Company  
Lansing Smith Unit 3/ Bay County  
DEP File No. PA 99-40, PSD-FL-269

The Department distributed a public notice package on November 3, 1999 to allow the applicant to construct a new unit at the existing Lansing Smith Generating Plant known as Lansing Smith Unit 3, Bay County. The Public Notice of Intent to Issue was published in the Panama City News Herald on November 12, 1999.

### COMMENTS/CHANGES

Comments were received from the EPA by letters dated November 23 and December 9, 1999.

Comments were received from the applicant by letter dated December 15, 1999 and January 7, 2000.

The applicant commented on the Technical Evaluation and Preliminary Determination (TEPD), the Draft BACT and the Draft Permit. The comments related to the BACT and permit are summarized below and the Department's responses are included following each comment. Comments related to the TEPD are noted and maintained in the file.

EPA commented on the proposed Custom Fuel Monitoring Schedule as well as the Draft BACT and Draft Permit.

Pursuant to notice, the Division of Administrative Hearings, by its duly-designated Administrative Law Judge, P. Michael Ruff, conducted a formal site certification hearing (Case No. 99-2641EPP) in this proceeding on April 3, 2000 in Lynn Haven, Florida. It was recommended that the Siting Board grant full and final certification to Gulf Power Company, under Section 403, Part II, Florida Statutes, for the location, construction, and operation of Smith Unit 3, representing a 575 MW combined cycle unit, as described in the Site Certification Application and the evidence presented at the certification hearing.

On July 25, 2000, the Siting Board concurred with the Administrative Law Judge's recommendation and authorized issuance of related permits via its Final Order.

#### DRAFT Permit Cover Page and Facility Description:

The applicant noted that the general description for Smith Unit 3 should be updated to include heat input with Power Augmentation and heat input to the HRSG corrected to 65°F, as well as a reference to the gas heater pipeline burners. [Applicant's comments 1 and 3]

RESPONSE: The Facility Description will be revised.

#### DRAFT Permit General and Administrative Conditions:

1. *General Condition 7:* The applicant requested that the last sentence of this condition (BACT revisitiation) should be removed, as it does not include all of the PSD applicability criteria nor exemptions. It is additionally stated that these units do not have a heat input restriction, only a NO<sub>x</sub> cap limit in tons per year. [Applicant's comment 11]

RESPONSE: The last sentence of this condition does not include all of the PSD applicability criteria nor exemptions, as noted by the applicant. The purpose of this sentence is to highlight those activities, which commonly trigger a PSD applicability determination for a clear understanding by all parties. Concerning the applicant's statement regarding heat input, this is addressed in the Department's response to applicant comment 13.

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2. *General Condition 9:* The applicant requested that this condition be reworded, providing for which agency receives the original vs. copy of the acid rain permit. [Applicant comment 12]

RESPONSE: The Acid Rain Program is run by the EPA, who should receive the original application.

DRAFT Permit Specific Conditions: [Note – These comments are being addressed in the order in which the applicant provided them, rather than sequentially via permit condition number].

3. *Applicant comment 2:* The applicant noted that there are several references to the “concurrent installation of low NO<sub>x</sub> burners on Smith Unit 1” and commented that they should be deleted. These references exist within the BACT, the Technical Evaluation and the permit. The applicant stated that “The Smith Unit 1 Low NO<sub>x</sub> burner tips were installed in 1999. The advanced computer assisted operational controls (GNOCIS) are not yet scheduled for installation. The facility-wide annual NO<sub>x</sub> emissions limit is sufficient to ensure that there will be no significant net emissions increase due to the installation of Smith Unit 3. References to the use of Low NO<sub>x</sub> Burner Tips and GNOCIS on Smith Unit 1 are unnecessary.”

RESPONSE: The Department partially agrees, as the “concurrent” reference to the low NO<sub>x</sub> burners is inappropriate in light of their prior installation. However, the facility-wide annual NO<sub>x</sub> emissions limit alone is *not* sufficient to ensure that there will be no significant net emissions increase due to the installation of Smith Unit 3, without the establishment of concurrent NO<sub>x</sub> controls and reduction measures through specific permit conditions. See the Department’s response to applicant comment 15 for further discussion.

4. *Applicant comment 4:* The applicant commented that there are several references to PM/PM<sub>10</sub> emissions at 253 TPY and that this should be corrected to be 184 TPY from the new unit and 79.5 from the cooling tower. Additionally, the EPA noted the 253 TPY vs. 264 TPY discrepancy.

RESPONSE: The 253 TPY value was cited by the applicant in Appendix 10.2.7, Section 1.2 page 3 of the application. However, the Department agrees to amend the BACT references accordingly to 264 TPY based upon other submittals.

5. *Applicant comment 5:* The applicant requested that the numerical limits associated with the sulfur content of natural gas (2.0 gr/100 scf) should be removed or replaced with a value of 20 gr/100 scf.

RESPONSE: The 2.0 gr/100 scf value was cited by the applicant as one basis (along with other factors such as heat input) for SAM and SO<sub>2</sub> emissions of the new unit. This value is BACT and is consistent with many recent BACT determinations. The permit incorporates the BACT information, but provides for a custom fuel-monitoring plan. Reference to a *grain/100 scf* value is shown as 20 gr/100 scf in Specific Condition 23.

6. *Applicant comment 6:* The applicant suggested that Specific Condition 32 was not consistent with the Technical Evaluation or BACT, since the permit condition allows for CO compliance testing at less than capacity, when conducted concurrent with the annual RATA testing for the NO<sub>x</sub> CEMS pursuant to 40 CFR 75.

RESPONSE: The Department will clarify the RATA reference within the BACT determination, as exceptions to Method 10 are described more thoroughly within permit condition.

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7. *Applicant comment 7:* The applicant requested that Specific Conditions 27 and 30 be revised to clarify that excess emissions must be reported based upon the applicable averaging periods. The applicant goes on to state that "Because the NO<sub>x</sub> limit is based on a 30-day rolling average, only 30-day averages above the limit should be required to be reported as an excess emission."

RESPONSE: The permit conditions cited by the applicant are typical of those in similar permits. Specific Condition 27 requires reporting for excess emissions due to malfunction. Specific Condition 30 will be modified to reflect the appropriate averaging period.

8. *Applicant comment 8:* The applicant contended that the proposed multi-unit cap on NO<sub>x</sub> emissions did not include the small, diesel-fired peaking unit. However, they note that "in the spirit of commitment to ensure no net increase in overall NO<sub>x</sub> emission, Gulf Power accepts this new Condition which places a cap on the full facility for NO<sub>x</sub>".

RESPONSE: According to Department records, NO<sub>x</sub> emissions from the peaking unit averaged less than 13 TPY during the 3-year period of 1994 through 1996 upon which the cap was based. As stated in the Draft BACT, it is considered relatively insignificant for purposes of establishing the cap.

9. *Applicant Comment 9:* The applicant noted that some of the values listed within the Table of the TEPD Section 7.2.4 (PSD Class II Significant Impact Levels) were listed incorrectly.

RESPONSE: The Department notes the discrepancy.

10. *Applicant comment 10:* The applicant noted that within the "Regulatory Classification" part of the permit (page 2) it indicates that the modification results in emissions increases greater than 40 TPY of NO<sub>x</sub>.

RESPONSE: Within the context of the intended action (i.e. under the presumption that the Department has reasonable assurance that the established NO<sub>x</sub> emission limits will indeed be met), this reference will be deleted.

11. *Applicant comment 13:* The applicant requested that the heat input limits proposed within the Draft Permit (Specific Conditions 8 and 9) should be deleted. The rationale cited by the applicant is that these provisions could result in additional requirements (periodic monitoring) in lieu of tracking heat input rates during compliance testing.

RESPONSE: The heat input limits are necessary as they form the basis for most emission calculations. As currently drafted, no permit conditions require monitoring on a more frequent basis than during compliance testing. The Department will add the following permitting note, as has been done in several Title V permits: {Permitting note: The heat input limitations have been placed in the permit to identify the capacity of each emissions unit for purposes of confirming that emissions testing is conducted within 90-100 percent of the emissions unit's rated capacity (or to limit future operation to 110 percent of the test load), to establish appropriate limits and to aid in determining future rule applicability}.

12. *Applicant comment 14:* The applicant requested that Draft Permit Specific Conditions 12 and 13 should be eliminated because there is no add-on pollution control equipment planned for the new unit and their elimination will avoid confusion as well as periodic monitoring issues.

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RESPONSE: The Department has determined through the BACT that "good combustion" is one means of ensuring the emissions of various pollutants are controlled effectively. The Department believes that good operating practices as well as training of personnel are required in order to attain this. The applicant's submittal (PSD application pages 13 and 38) indicated that "Dry low-NO<sub>x</sub> combustors" are the control equipment for NO<sub>x</sub> emissions on the CT's. Accordingly, circumvention of the pollution control equipment is disallowed. This rationale is consistent with the permitting action of GRU's J.R. Kelly No. 8, PSD-FL-276.

13. *Applicant comment 15:* The applicant contended that the use of Dry low NO<sub>x</sub> combustion technology should not be required, as it was not required from the BACT. Accordingly, its reference in Specific Conditions 15 and 17 should be deleted.

RESPONSE: [See Department responses to items number 3, 10 and 12]. The Department has made a Preliminary Determination that the project will net out of PSD for NO<sub>x</sub>. This netting assumes certain emission levels from each unit within the proposed cap. The basis for this netting determination includes the applicant's submittals, which state that:

- a. low NO<sub>x</sub> burners and associated controls will be installed on Unit 1 representing a significant emission reduction from past documented levels
- b. that Dry LNB will be installed on the CT's representing a certain level of NO<sub>x</sub> emissions, along with the assumption that
- c. existing Unit 2 will operate in a similar fashion to past history and that
- d. the peaking diesels represent a relatively insignificant contribution to the facility's NO<sub>x</sub> emissions

These assumptions are vital to the validity of the netting analysis and therefore must be reflected within the permit. Lacking this analysis, the source would need to undergo a PSD review for NO<sub>x</sub> emissions. Related permit conditions will note that these requirements are in order to avoid PSD.

14. *Applicant comment 16:* The applicant contended that the new unit's NO<sub>x</sub> limits are voluntary since PSD was not triggered for NO<sub>x</sub>. Accordingly the applicant requested that all references to PSD or BACT for NO<sub>x</sub> be eliminated and the 24-hour averaging period proposed by the Department for NO<sub>x</sub> compliance be eliminated. The applicant further stated "Gulf has proposed an annual limit for NO<sub>x</sub> to show compliance with the proposed annual NO<sub>x</sub> offset, but will accept a 30-day average limit in lb/hr". The EPA commented that the averaging period for NO<sub>x</sub> compliance should be shorter than the 24-hour period proposed by the Department and recommended that the excess emissions allowance be eliminated if the averaging period is to remain at 24-hours (see *Applicant comment 24* for further discussion of this issue).

RESPONSE: As noted above, the NO<sub>x</sub> limits represent one element of the underpinnings for the Department's Preliminary Determination. Since that determination concluded that a BACT review for NO<sub>x</sub> was not required, references to BACT as it relates to NO<sub>x</sub> will be eliminated. As noted in several of the Department's comments above, the Department requires a means of reasonable assurance that the applicant will be able to comply with that determination. Accordingly, the references will be changed to Rule 62-4.070, F.A.C. and as noted in the response to the applicant's comment 15, that the requirements are deemed necessary in order to avoid PSD. As noted previously, this is consistent with the recent permitting action at GRU. The Department also finds that for those projects that have netted out of PSD for NO<sub>x</sub>, averaging periods are routinely set on a 30-day rolling average. Therefore, the permitted averaging period for NO<sub>x</sub> compliance will be

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revised as per the applicant's request, however no excess emissions will be allowed (see *Applicant comment 24*).

15. *Applicant comments 17 and 26*: The applicant contended that the numeric emission limit of 18.2 lbs/hour for the cooling tower should be deleted, since a determination of compliance is not feasible. Otherwise these limits may require periodic monitoring which can not be met. Additionally, the applicant recommended that the annual inspection requirement for the cooling tower (Draft Permit Specific Condition 31) be eliminated as a means of determining compliance with the PM limit. The applicant noted that O&M recommendations will be followed. The EPA recommended that the numeric PM emission limit of 9 lb/hr for the combustion turbines should be included, even though compliance will be determined by opacity.

RESPONSE: The lb/hr PM emission level for the cooling tower was submitted by the applicant on pages 69 –72 of the application and is proposed in the Department's Draft BACT, although no compliance method is required within the permit. The Department recognizes that no EPA method currently exists for measuring cooling tower PM emissions, but believes that an initial certification/inspection is appropriate to certify that the installation is capable of meeting the BACT determined emissions and will clarify that this is required following installation and prior to startup. Concerning the EPA comment, the lb/hr PM emission rate will be included within the text of Specific Condition 24 along with a note indicating that the value is for informational purposes (given the uncertainty of measurement techniques).

16. *Applicant comment 18*: The applicant pointed out that the ISO corrections should not be required. Various rationale were cited by the applicant including that "The units are not subject to BACT and should not be corrected to ISO".

RESPONSE: The new unit is subject to BACT for a number of pollutants, excluding NO<sub>x</sub> as previously discussed. In order to compare ppmvd limits established by the Department with the actual emissions, a reference must be established. The NSPS requires the ISO correction method and this is reflected in the permit. The reference will be changed from ISO corrections to 15% O<sub>2</sub> for compliance with ppm emissions other than the NSPS demonstration.

17. *Applicant comment 19*: The applicant requested that the reference to combustor tuning within the Draft Permit Specific Condition 20 should be eliminated as it is unclear.

RESPONSE: This reference will be deleted given the difficulty of demonstrating compliance.

18. *Applicant comment 20*: The applicant rejected the use of CEMS flow monitors for heat input determinations.

RESPONSE: The Department is agreeable to the applicant's contention, and has not required use of flow monitors for heat input determinations within the Draft Permit.

19. *Applicant comment 21*: The applicant requested that the requirement of an engineering report be eliminated, as the Unit 1 burners have already been installed, causing an inability for the applicant to obtain the "before" data required by Specific Condition 20.

RESPONSE: The condition as currently written, requires a "before versus after" comparison of three pollutants (NO<sub>x</sub>, CO and PM). Although the applicant may not have a database upon which to perform the analysis for CO or PM, submittals have been made by the applicant for past NO<sub>x</sub>

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emissions (part of the basis referred to in the response to applicant's comment 15). Therefore, the Department will eliminate this requirement for CO and PM only.

20. *Applicant comment 22:* The applicant suggested that the Department should not require limits in terms of both ppm and lbs/hr for CO and VOC, noting that lbs/hr was preferred. Applicant additionally requested that references to ISO be eliminated and that the references to the Department's requirement that reasonable measures be implemented to maintain emissions at specific levels when the duct burners are off should be eliminated.

RESPONSE: [See Department's response to applicant's comments 18 and 19] The Department routinely sets BACT for CO and VOC based upon ppm levels. The references to lbs/hr will be listed as informational references only. The reasonable measures comments will be eliminated due to inherent difficulties in demonstrating compliance.

21. *Applicant comment 23:* The applicant pointed out that several discrepancies exist in Draft Permit Specific Condition 23 and suggested that the condition should be deleted.

RESPONSE: The Department notes the discrepancies will eliminate this reference to avoiding PSD review and note that the TPY emissions of SO<sub>2</sub> are for informational purposes.

22. *Applicant comment 24:* The applicant requested clarification concerning additional excess emissions hours for cold/warm startups. The applicant specifically requested that the 3 and 4-hour periods for cold and warm start-ups should be allowed for each turbine and HRSG and that these hours should be "in addition to a 2-hour period for shutdowns and malfunctions." The applicant also pointed out an inconsistency between the Draft BACT Determination allowance of 2 hours of excess emissions for a warm start and the Draft Permit allowance of 3 hours. The EPA took exception to automatic exemptions of up to 4 hours due to startup, shutdown or malfunction and recommended that these be eliminated. Through conversation with EPA region IV on 12/20/99, the EPA *strongly* recommended that these automatic exemptions be eliminated completely in the event that FDEP intends to lengthen the compliance-averaging period beyond 24 hours.

RESPONSE: The excess emission allowance (see Draft Permit Specific Condition 25) will be eliminated. Additionally, the BACT will be revised to reflect that no excess emissions allowances will be permitted, due to the granting of a 30-day rolling average for compliance.

23. *Applicant comments 25 and 29:* The applicant requested clarification on the method of compliance with the facility-wide NO<sub>x</sub> emission limit. The applicant requested that annual emissions be calculated by utilizing the CEMS annual emission rate (in lbs/MMBtu) and multiplied by the annual unit heat input via sampling and analysis methods. For the diesel-fired peaking CT, the applicant recommended using AP-42 emission factors since no CEMS is installed. Applicant additionally requested clarification on the compliance methods with the separate duct burners. Lastly, the applicant requested that Specific Condition 43 be revised to clarify that the methodology proposed by the applicant is the approved means of compliance with the facility-wide NO<sub>x</sub> cap.

RESPONSE: As written, Specific Condition 43 requires compliance with the facility-wide NO<sub>x</sub> cap on a monthly basis, via a 12-month rolling average. The Department believes that this represents the longest averaging period allowable in order to reasonably maintain enforceability.

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The methods proposed by the applicant are acceptable to the Department on this basis and Specific Condition 43 will be revised.

24. *Applicant comment 27:* The applicant recommended that the "3 day" reference within the Draft Permit Specific Condition 40 should be for postmark purposes and that NO<sub>x</sub> emissions should not be required to be corrected to 15% oxygen as referenced in Specific Condition 40.

RESPONSE: The Department is agreeable to revising the 3-day reference. See response to applicant's comment 18 for similar discussion of the necessity for correction to a standard.

25. *Applicant comment 28:* The applicant commented that Draft Permit Specific Condition 41 may not require EPA approval and that NO<sub>x</sub> emissions should not be required to be corrected to ISO conditions.

RESPONSE: [See previous discussions for ISO correction issue] According to EPA Region IV, approval is required for this exemption.

26. *Applicant comment 30:* The applicant requested that the latest EPA guidelines allow for a one year sampling period to qualify for the standard default value of 0.0006 lbs/MMBtu for natural gas and that Draft Permit Specific Condition 44 should be revised accordingly.

RESPONSE: The applicant must comply with the Custom Fuel Monitoring Plan which was approved by the EPA in their letter dated November 23, 1999.

27. *Applicant comment 31:* The applicant requested that the reference to annual NO<sub>x</sub> testing within the Draft BACT Determination should be eliminated "to be consistent with other provisions in the permit and because NO<sub>x</sub> CEMS are being used for compliance".

RESPONSE: The Department is agreeable to this, given that the unit nets out of PSD for NO<sub>x</sub> and that CEMS are used for compliance.

28. *Applicant comment 32:* The applicant requested that "Because it is impracticable to continuously monitor and record the emissions or megawatt output from the duct burner alone, .....the permit be revised to clarify that such monitoring and recordkeeping are not required. We understand that EPA will also need to approve this approach."

RESPONSE: The Department has revised the draft permit condition, which addresses this request.

## CONCLUSION

The final action of the Department is to issue the permit with the changes described above.



# Department of Environmental Protection

Jeb Bush  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

David B. Struhs  
Secretary

## PERMITTEE:

Gulf Power Company  
One Energy Place  
Pensacola, Florida 32520-0328

File No.	PSD-FL-269 (PA99-40)
FID No.	0050014
SIC No.	4911
Expires:	December 31, 2002

## Authorized Representative:

Robert G. Moore, V.P. Power Generation/Transmission

## PROJECT AND LOCATION:

Permit pursuant to the requirements for the Prevention of Significant Deterioration of Air Quality (PSD Permit) for the construction of two nominal 170 megawatt (MW), gas-fired, stationary combustion turbine-electrical generators with duct-fired recovery steam generators (HRSGs) that will raise sufficient steam to produce approximately another 200 MWs from the steam generator. The unit will achieve a nominal 566 megawatts at annual average site conditions with duct burners. The unit is capable of a maximum of approximately 574 megawatts in combined cycle operation with power augmentation and evaporative cooling at 95 degrees F. The maximum heat input of the combustion turbines is 1751 MBTU/hr (LHV at 65 degrees F) each. The maximum heat input of the duct burners is 275 MBTU/hr (LHV at 65 degrees F) each. The plant will also include two 121 foot stacks; a small heater for the gas pipeline; and a 10-cell, mechanical draft salt water cooling tower. The unit is designated as Unit 3 and will be located at the Lansing Smith Electric Generating Plant, 4300 Highway 2300, Southport, Bay County. UTM coordinates are: Zone 16; 625.03 km E; 3349.08 km N.

## STATEMENT OF BASIS:

This PSD permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.) and 40CFR52.21. The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

Attached Appendices and Tables made a part of this permit:

Appendix BD  
Appendix GC

BACT Determination  
Construction Permit General Conditions

Howard L. Rhodes, Director  
Division of Air Resources  
Management

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# PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-269

## SECTION I - FACILITY INFORMATION

### FACILITY DESCRIPTION

The existing Lansing Smith Electric Generating Plant consists of two oil or coal-fired steam units and one oil-fired combustion (peaking) turbine with a combined nominal generating capacity of approximately 420 megawatts (MW).

The proposed Gulf Smith Unit 3 will achieve a nominal 566 megawatts at annual average site conditions with duct burners. The unit is capable of a maximum of approximately 574 megawatts in combined cycle operation with power augmentation and evaporative cooling at 95 degrees F. The maximum heat input of the combustion turbines is a nominal 1751 MBTU/hr (LHV at 65 degrees F) each. The maximum heat input of the duct burners is a nominal 275 MBTU/hr (LHV at 65 degrees F) each. The plant will also include two 121 foot stacks; a small heater for the gas pipeline; and a 10-cell, mechanical draft salt water cooling tower. Simple cycle operation is not included within this permitting action. New major support facilities for Unit 3 include water treatment and storage facilities.

Emissions from Gulf Smith Unit 3 will be controlled by Dry Low NO<sub>x</sub> (DLN) combustors firing exclusively pipeline quality natural gas. Inherently clean fuels and good combustion practices will be employed to control all pollutants.

### EMISSION UNITS

This permit addresses the following emission units:

EMISSION UNIT	SYSTEM	EMISSION UNIT DESCRIPTION
004	Power Generation	One nominal 170 MW Gas Combustion Turbine complete with HRSG and Duct Burner
005	Power Generation	One nominal 170 MW Gas Combustion Turbine complete with HRSG and Duct Burner
006	Water Cooling	Cooling Tower

### REGULATORY CLASSIFICATION

The facility is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 tons per year (TPY).

This facility is within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 100 TPY for at least one criteria pollutant, the facility is also a Major Facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD). Pursuant to Table 62-212.400-2, this facility modification results in emissions increases greater than 25/15 TPY of PM/PM<sub>10</sub>, 40/7 TPY of SO<sub>2</sub>/SAM, 100 TPY of

# PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-269

## SECTION I - FACILITY INFORMATION

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CO and 40 TPY of VOCs. These pollutants require review per the PSD rules and a determination for Best Available Control Technology (BACT) per Rule 62-212.400, F.A.C.

This Project is subject to the applicable requirements of Chapter 403, Part II, F.S., Electric Power Plant and Transmission Line Siting because the steam electric generating capacity of this facility is greater than 75 MW. [F.S Chapter 403.503 (12) Definitions]

This facility is also subject to certain Acid Rain provisions of Title IV of the Clean Air Act..

### PERMIT SCHEDULE

- 11/10/99 Notice of Intent published in The Panama City News Herald
- 11/01/99 Distributed Intent to Issue Permit
- 10/06/99 Application deemed complete and sufficient for PSD review.
- 06/07/99 Received PSD Application

### RELEVANT DOCUMENTS:

The documents listed below are the basis of the permit. They are specifically related to this permitting action, but not all are incorporated into this permit. These documents are on file with the Department.

- Application received on June 7, 1999
- Department/BAR letters to Gulf dated June 28, and September 23, 1999
- Gulf (through ECT) letters dated September 7, October 6 and December 15, 1999
- Department's Intent to Issue and Public Notice Package dated November 1, 1999.
- Letters from EPA Region IV dated November 23 and December 9, 1999.
- Department's Final Determination and Best Available Control Technology Determination issued concurrently with this Final Permit.

# PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-269

## SECTION II - ADMINISTRATIVE REQUIREMENTS

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### GENERAL AND ADMINISTRATIVE REQUIREMENTS

1. Regulating Agencies: All documents related to applications for permits to construct, operate or modify an emissions unit should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (FDEP), at 2600 Blainstone Road, Tallahassee, Florida 32399-2400 and phone number (850)488-0114. All documents related to reports, tests, and notifications should be submitted to the DEP Northwest District Office, 160 Governmental Center, Pensacola, Florida 32501-5794 and phone number 850/595-8300.
2. General Conditions: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in Appendix GC of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]
3. Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.
4. Forms and Application Procedures: The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. [Rule 62-210.900, F.A.C.]
5. Modifications: The permittee shall give written notification to the Department when there is any modification to this facility. This notice shall be submitted sufficiently in advance of any critical date involved to allow sufficient time for review, discussion, and revision of plans, if necessary. Such notice shall include, but not be limited to, information describing the precise nature of the change; modifications to any emission control system; production capacity of the facility before and after the change; and the anticipated completion date of the change. [Chapters 62-210 and 62-212, F.A.C.]
6. Expiration: Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of such approval, or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The Department may extend the 18-month period upon a satisfactory showing that an extension is justified. [Rule 62-4.070(4), 62-4.210(2)&(3), 62-210.300(1)(a), F.A.C.]
7. BACT Determination: In accordance with paragraph (4) of 40 CFR 51.166(j) the Best Available Control Technology (BACT) determination shall be reviewed and modified as appropriate in the event of a plant conversion. This paragraph states: "For phased construction projects, the determination of best available control technology shall be reviewed and modified as appropriate at the latest reasonable time which occurs no later than 18 months prior to commencement of construction of each independent phase of the project. At such time, the owner or operator of the applicable stationary source may be required to demonstrate the adequacy of any previous determination of best available control technology for the source." This reassessment will also be conducted for this project if there are any increases in heat input limits, hours of operation, oil firing, low or baseload operation, short-term or annual emission

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### SECTION II - ADMINISTRATIVE REQUIREMENTS

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limits, annual fuel heat input limits or similar changes. [40 CFR 51.166, Rule 62-4.070 F.A.C.]

8. Permit Extension: The permittee, for good cause, may request that this PSD permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (Rule 62-4.080, F.A.C.).
9. Application for Title IV Permit: An application for a Title IV Acid Rain Permit, must be submitted to the U.S. Environmental Protection Agency Region IV office in Atlanta, Georgia and a copy to the DEP's Bureau of Air Regulation in Tallahassee 24 months before the date on which the new unit begins serving an electrical generator (greater than 25 MW). [40 CFR 72]
10. Application for Title V Permit: An application for a Title V operating permit, pursuant to Chapter 62-213, F.A.C., must be submitted to the DEP's Bureau of Air Regulation, and a copy to the Department's Northwest District Office. [Chapter 62-213, F.A.C.]
11. New or Additional Conditions: Pursuant to Rule 62-4.080, F.A.C., for good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]
12. Annual Reports: Pursuant to Rule 62-210.370(2), F.A.C., Annual Operation Reports, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. Annual operating reports shall be sent to the DEP's Northwest District Office by March 1st of each year.
13. Stack Testing Facilities: Stack sampling facilities shall be installed in accordance with Rule 62-297.310(6), F.A.C.
14. Quarterly Reports: Quarterly excess emission reports, in accordance with 40 CFR 60.7 (a)(7) (c) (1998 version), shall be submitted to the DEP's Northwest District Office.

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## SECTION III - EMISSIONS UNIT(S) SPECIFIC CONDITIONS

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### APPLICABLE STANDARDS AND REGULATIONS:

1. Unless otherwise indicated in this permit, the construction and operation of the subject emission unit(s) shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S. and Florida Administrative Code Chapters 62-4, 62-17, 62-204, 62-210, 62-212, 62-213, 62-214, 62-296, and 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Parts 52, 60, 72, 73, and 75.
2. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. [Rule 62-210.300, F.A.C.]
3. These emission units shall comply with all applicable requirements of 40CFR60, Subpart A, General Provisions including:
  - 40CFR60.7, Notification and Recordkeeping
  - 40CFR60.8, Performance Tests
  - 40CFR60.11, Compliance with Standards and Maintenance Requirements
  - 40CFR60.12, Circumvention
  - 40CFR60.13, Monitoring Requirements
  - 40CFR60.19, General Notification and Reporting requirements
4. ARMS Emissions Units 004 and 005. Power Generation, each consisting of a nominal 170 megawatt combustion turbine-electrical generator and a supplementally fired (275 MMBtu/hr) heat recovery steam generator equipped with a natural gas fired duct burner. The CT's will include provisions for the optional use of evaporative coolers and steam power augmentation. The emissions units shall comply with all applicable provisions of 40 CFR 60, Subpart Da, Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978, adopted by reference in Rule 62-204.800(7), F.A.C.; and 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines, adopted by reference in Rule 62-204.800(7)(b), F.A.C. except as noted herein. The Subpart GG requirement to correct NSPS test data to ISO conditions applies.
5. ARMS Emission Unit 006. Cooling Tower is a regulated emission unit. The Cooling Tower is not subject to a NESHAP because Chromium-based chemical treatment is not used.
6. All notifications and reports required by the above specific conditions shall be submitted to the DEP's Northwest District Office.

### GENERAL OPERATION REQUIREMENTS

7. Fuels: Only pipeline natural gas shall be fired in the unit. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]
8. Combustion Turbine Capacity: The maximum heat input rate, based on the lower heating value (LHV) of the fuel to this Unit at ambient conditions of 65°F temperature, 100% load, and 14.7

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psi pressure shall not exceed 1,751 million Btu per hour (mmBtu/hr) when firing natural gas. The maximum heat input rates will vary depending upon ambient conditions and the combustion turbine characteristics. Manufacturer's curves corrected for site conditions or equations for correction to other ambient conditions shall be provided to the Department of Environmental Protection (DEP) within 45 days of completing the initial compliance testing. {Permitting note: The heat input limitations have been placed in the permit to identify the capacity of each emissions unit for purposes of confirming that emissions testing is conducted within 90-100 percent of the emissions unit's rated capacity (or to limit future operation to 110 percent of the test load), to establish appropriate limits and to aid in determining future rule applicability} [Design, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

9. Heat Recovery Steam Generator equipped with Duct Burner. The maximum heat input rate of each natural gas fired duct burner shall not exceed 275 MMBtu/hour (LHV). {Permitting note: The heat input limitations have been placed in the permit to identify the capacity of each emissions unit for purposes of confirming that emissions testing is conducted within 90-100 percent of the emissions unit's rated capacity (or to limit future operation to 110 percent of the test load), to establish appropriate limits and to aid in determining future rule applicability} [Design, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]
10. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary.
11. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the DEP Northwest District office as soon as possible, but at least within (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit and the regulations. [Rule 62-4.130, F.A.C.]
12. Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. [Rule 62-4.070(3), F.A.C.]
13. Circumvention: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rules 62-210.650, F.A.C.]
14. Maximum allowable hours of operation for the 566 MW Combined Cycle Plant are 8760 hours per year while firing natural gas. Operation in steam power augmentation mode is limited to

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1000 hours per year. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

### CONTROL TECHNOLOGY

15. Dry Low NO<sub>x</sub> (DLN) combustors shall be installed on the stationary combustion turbine and Low NO<sub>x</sub> burners shall be installed in the duct burner arrangement to comply with the NO<sub>x</sub> emissions limits listed in Specific Conditions 19 and 20 [Rules 62-4.070 and 62-204.800(7), F.A.C. to avoid PSD Review]
16. The permittee shall design these units to accommodate adequate testing and sampling locations for compliance with the applicable emission limits (per each unit) listed in Specific Conditions No. 19 through 24. [Rule 62-4.070, Rule 62-204.800, F.A.C., and 40 CFR60.40a(b)]
17. DLN systems shall each be installed as per manufacturer's recommendation. [Rule 62-4.070 and 62-204.800(7), F.A.C. to avoid PSD Review]
18. Drift eliminators shall be installed on the cooling tower to reduce PM/PM<sub>10</sub> emissions.

### EMISSION LIMITS AND STANDARDS

Note: The following emission limits and standards shall apply upon completion of the initial compliance tests, certification tests and performance specification tests as applicable, for each unit.

19. The following table is a summary of the BACT determination and is followed by the applicable specific conditions. Values are corrected to 15 % O<sub>2</sub> on a dry basis. These limits or their equivalent in terms of lb/hr or NSPS units, as well as the applicable averaging times, are followed by the applicable specific conditions. Each Unit shall be initially tested to comply with the applicable NSPS and with the BACT limits as indicated below: [Rules 62-212.400, 62-204.800(7)(b) (Subpart GG and Da), 62-210.200 (Definitions-Potential Emissions) F.A.C.]

Emission Unit	NO <sub>x</sub> <sup>(1)</sup>	CO BACT	SO <sub>2</sub> /SAM BACT	VOC BACT	PM/Visibility (% Opacity)	Technology and Comments
C.T.'s : With Duct Burners	82.9 lb/hr	16 ppm @ 15% O <sub>2</sub>	2 gr/100 scf natural gas <sup>(3)</sup>	4 ppm @ 15% O <sub>2</sub>	10 - gas	Dry Low NO <sub>x</sub> Combustors Natural Gas, Good Combustion
Steam power Augmentation	113.2 lb/hr	23 ppm @ 15% O <sub>2</sub>	2 gr/100 scf natural gas <sup>(3)</sup>	6 ppm @ 15% O <sub>2</sub>	10 - gas	Unit limited to 1000 hours per year of operation
Cooling Tower					18.2 lb/hr <sup>(2)</sup>	Drift Eliminators

(1) NO<sub>x</sub> limits not determined by BACT. (2) Listed for informational purposes only. (3) See Fuel Mon. Sch. in Specific Cond.33

### 20. Nitrogen Oxides (NO<sub>x</sub>) Emissions:

- Emissions of NO<sub>x</sub> in the stack exhaust gas, with the combustion turbine operating and the duct burner on shall not exceed 82.9 lb/hr (30 day rolling average). Emissions of NO<sub>x</sub> in the stack exhaust gas, with the combustion turbine operating with steam augmentation and the duct burner on shall not exceed 113.3 lb/hr (30 day rolling average). Compliance will

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be determined by the continuous emission monitor system (CEMS) and prorated daily as necessary based upon hours of operation per operating mode. Emissions of NO<sub>x</sub> in the stack exhaust gas with the combustion turbine operating with the duct burner on shall not exceed 82.9 lb/hr and 113.3 lb/hr with steam augmentation to be demonstrated by initial stack test. [Rule 62-4.070 and 62-204.800(7), F.A.C. to avoid PSD Review]

- Emissions of NO<sub>x</sub> from the duct burner shall not exceed 0.1 lb/MMBtu, which is more stringent than the NSPS (see Specific Condition 46). [Rule 62-4.070 and 62-204.800(7), F.A.C. to avoid PSD Review]
- When NO<sub>x</sub> monitoring data is not available, substitution for missing CEMS data shall be handled as required by Title IV (40 CFR 75) to calculate any specified average time. Heat input for these periods shall be determined by fuel sampling and measurement.
- **Facility-wide NO<sub>x</sub> emissions cap:** In addition to individual (point source) emission limits and NO<sub>x</sub> averaging plan requirements, the Lansing Smith facility shall be required to comply with a facility-wide NO<sub>x</sub> emissions cap of 6666 TPY. CEMS shall be the method of compliance. See specific condition 43 for reporting and record-keeping requirements.
- The installation of low NO<sub>x</sub> burners and a new burner management system are authorized for existing Smith Unit 1 (EU-001) as a means of complying with the facility-wide cap. Within 18 months of commissioning of these burners, an engineering report shall be submitted to the Department summarizing the observed changes (before versus after) in NO<sub>x</sub>.

21. Carbon Monoxide (CO) Emissions: Emissions of CO in the stack exhaust gas with the combustion turbine operating and duct burner on shall exceed neither 16 ppm nor 23 ppm (@ 15%O<sub>2</sub>) with steam augmentation to be demonstrated annually by stack test using EPA Method 10. {For informational purposes, this equates to 78.7 lb/hr and 116.6 lb/hr respectively} [Rule 62-212.400, F.A.C.]
22. Volatile Organic Compounds (VOC) Emissions: Emissions of VOC in the stack exhaust gas with the combustion turbine operating and duct burner on shall exceed neither 4 ppm nor 6 ppm (@ 15%O<sub>2</sub>) with steam augmentation to be demonstrated by initial stack test using EPA Method 18, 25 or 25A. {For informational purposes, this equates to 10.2 lb/hr and 16.8 lb/hr respectively} [Rule 62-212.400, F.A.C.]
23. Sulfur Dioxide (SO<sub>2</sub>) emissions: SO<sub>2</sub> emissions shall be limited by firing pipeline natural gas (sulfur content less than 20 grains per 100 standard cubic foot). Compliance with this requirement in conjunction with implementation of the Custom Fuel Monitoring Schedule in Specific Condition 44 will demonstrate compliance with the applicable NSPS SO<sub>2</sub> emissions limitations from the duct burner or the combustion turbine. {For informational purposes, annual SO<sub>2</sub> emissions will be up to 105 TPY}[40CFR60 Subpart GG and Rules 62-4.070, 62-212.400, and 62-204.800(7), F.A.C.]

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24. Visible emissions (VE): VE emissions shall serve as a surrogate for PM/PM<sub>10</sub> emissions from the combustion turbine operating with or without steam augmentation and/or the duct burner and shall not exceed 10 percent opacity from the stack in use. PM/PM<sub>10</sub> emissions (for information only) are up to 43 lb/hr. [Rules 62-4.070, 62-212.400, and 62-204.800(7), F.A.C.]

#### EXCESS EMISSIONS

25. [Deleted]
26. Excess emissions entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited pursuant to Rule 62-210.700, F.A.C. These emissions shall be included in the 30 day rolling average for NO<sub>x</sub>.
27. Excess Emissions Report: If excess emissions occur for more than two hours due to malfunction, the owner or operator shall notify DEP's Northwest District office within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Pursuant to the New Source Performance Standards, all excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. Following this format, 40 CFR 60.7, periods of startup, shutdown, malfunction, shall be monitored, recorded, and reported as excess emissions when emission levels (in terms of applicable averaging periods) exceed the permitted standards listed in Specific Condition No. 19 through 24. [Rules 62-4.130, 62-204.800, 62-210.700(6), F.A.C., and 40 CFR 60.7 (1998 version)].

#### COMPLIANCE DETERMINATION

28. Compliance with the allowable emission limiting standards shall be determined within 60 days after achieving the maximum production rate, but not later than 180 days of initial operation of the unit, and annually thereafter as indicated in this permit, by using the following reference methods as described in 40 CFR 60, Appendix A (1998 version), and adopted by reference in Chapter 62-204.800, F.A.C.
29. Initial (I) performance tests shall be performed by the deadlines in Specific Condition 28. Initial tests shall also be conducted after any substantial modifications (and shake down period not to exceed 100 days after re-starting the CT) of air pollution control equipment such as installation of SCR or change of combustors. Annual (A) compliance tests shall be performed during every federal fiscal year (October 1 - September 30) pursuant to Rule 62-297.310(7), F.A.C., on these units as indicated. The following reference methods shall be used. No other test methods may be used for compliance testing unless prior DEP approval is received in writing.
- EPA Reference Method 9, "Visual Determination of the Opacity of Emissions from Stationary Sources" (I, A).

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### SECTION III - EMISSIONS UNIT(S) SPECIFIC CONDITIONS

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- EPA Reference Method 10, "Determination of Carbon Monoxide Emissions from Stationary Sources" (I, A).
  - EPA Reference Method 20, "Determination of Oxides of Nitrogen Oxide, Sulfur Dioxide and Diluent Emissions from Stationary Gas Turbines." Initial test only for compliance with 40CFR60 Subpart GG, Da. Initial (only) NO<sub>x</sub> compliance test for the duct burners (Specific Condition 20) shall be accomplished via testing with duct burners "on" as compared to "off" and computing the difference.
  - EPA Reference Method 18, 25 and/or 25A, "Determination of Volatile Organic Concentrations." Initial test only.
30. Continuous compliance with the NO<sub>x</sub> emission limits: Continuous compliance with the NO<sub>x</sub> emission limits shall be demonstrated with the CEM system based on the applicable averaging time of 30 day rolling average (DLN). Based on CEMS data, a separate compliance determination is conducted at the end of each operating day and a new average emission rate is calculated from the arithmetic average of all valid hourly emission rates from the previous operating day. A valid hourly emission rate shall be calculated for each hour in which at least two NO<sub>x</sub> concentrations are obtained at least 15 minutes apart. A valid operating day shall consist of at least one valid operating hour. These excess emissions periods shall be reported as required in Condition 41. Continuous compliance with the 0.1 lb/MMBtu limit for the duct burners will be demonstrated through continuous compliance with the combined duct burner and CT emission limits (see Specific Condition 46). [Rule 62-4.070 and 62-204.800(7), F.A.C. to avoid PSD Review]
31. Compliance with the SO<sub>2</sub> and PM/PM<sub>10</sub> emission limits: Notwithstanding the requirements of Rule 62-297.340, F.A.C., the use of pipeline natural gas, is the method for determining compliance for SO<sub>2</sub> and PM<sub>10</sub>. For the purposes of demonstrating compliance with the 40 CFR 60.333 SO<sub>2</sub> standard, ASTM methods D4084-82 or D3246-81 (or equivalent) for sulfur content of gaseous fuel shall be utilized in accordance with the EPA-approved custom fuel monitoring schedule or natural gas supplier data may be submitted or the natural gas sulfur content referenced in 40 CFR 75 Appendix D may be utilized. However, the applicant is responsible for ensuring that the procedures in 40 CFR 60.335 or 40 CFR 75 are used when determination of fuel sulfur content is made. Analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency pursuant to 40 CFR 60.335(e) (1998 version). A certification following installation (and prior to startup) shall be submitted that the drift eliminators were installed and that the installation is capable of meeting 0.001 gallons/100 gallons recirculation water flowrate. [BACT]
32. Compliance with CO emission limit: An initial test for CO shall be conducted concurrently with the initial NO<sub>x</sub> test, as required. The initial NO<sub>x</sub> and CO test results shall be the average of three valid one-hour runs. Annual compliance testing for CO may be conducted at less than capacity when compliance testing is conducted concurrent with the annual RATA testing for the NO<sub>x</sub> CEMS required pursuant to 40 CFR 75. Alternatively to annual testing in a given

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year, periodic tuning data may be provided to demonstrate compliance in the year the tuning is conducted.

33. Compliance with the VOC emission limit: An initial test is required to demonstrate compliance with the VOC emission limit. Thereafter, the CO emission limit and periodic tuning data will be employed as surrogate and no annual testing is required.
34. Testing procedures: Testing of emissions shall be conducted with the combustion turbine operating at permitted capacity. Permitted capacity is defined as 95-100 percent of the maximum heat input rate allowed by the permit, corrected for the average ambient air temperature during the test (with 100 percent represented by a curve depicting heat input vs. ambient temperature). If it is impracticable to test at permitted capacity, the source may be tested at less than permitted capacity. In this case, subsequent operation is limited by adjusting the entire heat input vs. ambient temperature curve downward by an increment equal to the difference between the maximum permitted heat input (corrected for ambient temperature) and 105 percent of the value reached during the test until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity. Procedures for these tests shall meet all applicable requirements (i.e., testing time frequency, minimum compliance duration, etc.) of Chapters 62-204 and 62-297, F.A.C.
35. Test Notification: The DEP's Northwest District office shall be notified, in writing, at least 30 days prior to the initial performance tests and at least 15 days before annual compliance test(s).
36. Special Compliance Tests: The DEP may request a special compliance test pursuant to Rule 62-297.310(7), F.A.C., when, after investigation (such as complaints, increased visible emissions, or questionable maintenance of control equipment), there is reason to believe that any applicable emission standard is being violated.
37. Test Results: Compliance test results shall be submitted to the DEP's Northwest District office no later than 45 days after completion of the last test run. [Rule 62-297.310(8), F.A.C.].

#### NOTIFICATION, REPORTING, AND RECORDKEEPING

38. Records: All measurements, records, and other data required to be maintained by Gulf shall be recorded in a permanent form and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. These records shall be made available to DEP representatives upon request.
39. Compliance Test Reports: The test report shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8), F.A.C.

#### MONITORING REQUIREMENTS

40. Continuous Monitoring System: The permittee shall install, calibrate, maintain, and operate a continuous emission monitor in the stack to measure and record the nitrogen oxides emissions

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from these units. Periods when NO<sub>x</sub> emissions are above the standards, listed in Specific Condition No 19 and 20, shall be reported to the DEP Northwest District Office within one working day (verbally) followed up by a written explanation postmarked not later than three (3) working days (alternatively by facsimile within one working day). [Rules 62-204.800, 62-210.700, 62-4.130, 62-4.160(8), F.A.C and 40 CFR 60.7 (1998 version)].

41. CEMS for reporting excess emissions: Subject to EPA approval, the NO<sub>x</sub> CEMS shall be used in lieu of the requirement for reporting excess emissions in accordance with 40 CFR 60.334(c)(1), Subpart GG (1998 version). Upon request from DEP, the CEMS emission rates for NO<sub>x</sub> on the CT's shall be corrected to ISO conditions to demonstrate compliance with the NO<sub>x</sub> standard established in 40 CFR 60.332.
42. Continuous Monitoring System Reports: The monitoring devices shall comply with the certification and quality assurance, and any other applicable requirements of Rule 62-297.520, F.A.C., 40 CFR 60.13, including certification of each device in accordance with 40 CFR 60, Appendix B, Performance Specifications and 40 CFR 60.7(a)(5) or 40 CFR Part 75. Quality assurance procedures must conform to all applicable sections of 40 CFR 60, Appendix F or 40 CFR 75. The monitoring plan, consisting of data on CEM equipment specifications, manufacturer, type, calibration and maintenance needs, and its proposed location shall be provided to the DEP Emissions Monitoring Section Administrator and EPA for review no later than 45 days prior to the first scheduled certification test pursuant to 40 CFR 75.62.
43. CEMS for reporting facility-wide NO<sub>x</sub> emissions: The NO<sub>x</sub> CEMS shall be used for ensuring compliance with the facility-wide cap. For the oil-fired peaking turbine (Emissions Unit EU-003) emissions shall be determined using fuel sampling and AP-42 emission factors. Monthly records shall be maintained of the facility-wide NO<sub>x</sub> emissions and the owner/operator shall calculate the facility-wide cap on a monthly basis for each prior consecutive 12-month period. These records shall be made available to inspectors as necessary. Additionally, a summary shall be filed with each quarterly report as a means of demonstrating compliance with the facility-wide cap for each consecutive 12-month period. The monthly calculations for the coal-fired units shall consist of use of the monthly NO<sub>x</sub> emission rate per MMBtu (as determined by CEMS using the appropriate fuel F factor) multiplied by the monthly fuel (MMBtu) usage as specified in the Lansing Smith Title V permit and converted as appropriate to tons of NO<sub>x</sub> for each unit. The sum of the monthly NO<sub>x</sub> emissions from the coal units and the oil-fired peaking turbine shall then be added to the monthly NO<sub>x</sub> emissions from the combined cycle unit, which will be calculated based upon the monthly average NO<sub>x</sub> emission rate (lb/hr) multiplied by the number of valid operating hours for the same period. This annual emissions cap shall become effective on the first day of the month following completion of the initial performance testing of Unit 3, and compliance shall begin based upon the first twelve months of operation thereafter. [Rule 62-4.070 and 62-204.800(7), F.A.C. to avoid PSD Review]
44. Natural Gas Monitoring Schedule: A custom fuel monitoring schedule pursuant to 40 CFR 75 Appendix D for natural gas may be used in lieu of the daily sampling requirements of 40 CFR

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60.334 (b)(2) provided the following requirements are met (monitoring of nitrogen content is not required):

- The permittee shall apply for an Acid Rain permit within the deadlines specified in 40 CFR 72.30.
- The permittee shall submit a monitoring plan, certified by signature of the Designated Representative, that commits to using a primary fuel of pipeline supplied natural gas pursuant to 40 CFR 75.11(d)(2).
- Each unit shall be monitored for SO<sub>2</sub> emissions using methods consistent with the requirements of 40 CFR 75 and certified by the USEPA.
- This custom fuel monitoring schedule will only be valid when pipeline natural gas is used as a primary fuel. If the primary fuel for these units is changed to a higher sulfur fuel, SO<sub>2</sub> emissions must be accounted for as required pursuant to 40 CFR 75.11(d).
- Gulf shall notify DEP of any change in natural gas supply for reexamination of this monitoring schedule. A substantial change in natural gas quality (i.e., sulfur content variation of greater than 1 grain per 100 cubic foot of natural gas) shall be considered as a change in the natural gas supply. Sulfur content of the natural gas will be monitored weekly by the natural gas supplier during the interim period when this monitoring schedule is being reexamined.

#### 45. Determination of Process Variables:

- The permittee shall operate and maintain equipment and/or instruments necessary to determine process variables, such as process weight input or heat input, when such data is needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
- Equipment and/or instruments used to directly or indirectly determine such process variables, including devices such as belt scales, weigh hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value [Rule 62-297.310(5), F.A.C]

46. Subpart Da Monitoring and Recordkeeping Requirements: The permittee shall comply with all applicable requirements of this Subpart [40CFR60, Subpart Da]. The requirements under 40 CFR 60.46a, 60.47a, 60.48a, and 60.49a regarding continuous monitoring systems for emissions of nitrogen oxides and for electrical output are inapplicable (due to impracticability) and therefore waived.

**APPENDIX GC**  
**GENERAL PERMIT CONDITIONS [RULE 62-4.160, F.A.C.]**

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- G.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.
- G.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 or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
- G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and 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 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.
- G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment 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.
- G.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.
- G.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.
- G.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 and 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.
- G.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.

**APPENDIX GC**  
**GENERAL PERMIT CONDITIONS [RULE 62-4.160, F.A.C.]**

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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.

- G.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 prescribed 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.
- G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
- G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, 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.
- G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.
- G.13 This permit also constitutes:
- (a) Determination of Best Available Control Technology (^);
  - (b) Determination of Prevention of Significant Deterioration (^); and
  - (c) Compliance with New Source Performance Standards (^).
- G.14 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 or 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:
    - 1. The date, exact place, and time of sampling or measurements;
    - 2. The person responsible for performing the sampling or measurements;
    - 3. The dates analyses were performed;
    - 4. The person responsible for performing the analyses;
    - 5. The analytical techniques or methods used; and
    - 6. The results of such analyses.
- G.15 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 incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.
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**APPENDIX BD**  
**BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)**

**Gulf Power Company Lansing Smith Plant**  
**Permit No. PSD-FL-269 and PA 99-40**  
**Southport, Bay County, Florida**

**BACKGROUND**

The applicant, Gulf Power Company (Gulf), proposes to install a combined-cycle power plant at its Lansing Smith Plant located at 4300 Highway 2300, Southport, Bay County. The proposed project will result in "significant increases" with respect to Table 62-212.400-2, Florida Administrative Code (F.A.C.) of emissions of particulate matter (PM and PM<sub>10</sub>), carbon monoxide (CO), volatile organic compounds (VOC) sulfur dioxide (SO<sub>2</sub>) and sulfuric acid mist (SAM), as well as nitrogen oxides (NO<sub>x</sub>). However, the applicant is proposing the installation of low NO<sub>x</sub> burners and advanced computer assisted operational controls on existing Smith Unit 1, as well as a facility-wide NO<sub>x</sub> cap, thereby ensuring no net increase in NO<sub>x</sub> emissions. The project is therefore subject to review for the Prevention of Significant Deterioration (PSD) and a determination of Best Available Control Technology (BACT) in accordance with Rules 62-212.400, F.A.C.

The primary units to be installed are two nominal 170 MW, General Electric 7FA combustion turbine-electrical generators, fired exclusively with pipeline natural gas. The project includes two supplementary-fired heat recovery steam generators (HRSGs) and a steam turbine-electrical generator to produce an additional 200 MW of electrical power. The units will exhaust through individual 121 foot stacks. Descriptions of the process, project, air quality effects, and rule applicability are given in the Technical Evaluation and Preliminary Determination dated November 2, 1999, accompanying the Department's Intent to Issue.

**DATE OF RECEIPT OF A BACT APPLICATION:**

The application was received on June 7, 1999 and included a proposed BACT proposal. Additional information concerning the application was submitted on September 7 and October 6.

**REVIEW GROUP MEMBERS:**

Michael P. Halpin, P.E., Review Engineer

**BACT DETERMINATION REQUESTED BY THE APPLICANT:**

POLLUTANT	CONTROL TECHNOLOGY	PROPOSED LIMIT
Particulate Matter	Pipeline Nat. Gas /Comb. Controls	10% Opacity
Volatile Organic Compounds	As Above	4 ppmvd @ 15% O <sub>2</sub> (w/duct burners) - gas 6 ppmvd @ 15% O <sub>2</sub> (w/DB & stm. aug.) - gas
Carbon Monoxide	As Above	16 ppmvd @ 15% O <sub>2</sub> (w/duct burners) - gas 23 ppmvd @ 15% O <sub>2</sub> (w/DB & stm. aug.) - gas
Sulfur Dioxide /SAM	As Above	2 gr/100 scf - gas
Nitrogen Oxides	Dry Low NO <sub>x</sub> Combustors (CTs) Dry Low NO <sub>x</sub> Burners (Unit 1 Boiler)	10.6 ppmvd (w/DB) @ 15% O <sub>2</sub> ** 13.6 ppmvd (w/DB & stm. aug.) **

\*\* NOTE: The proposed NO<sub>x</sub> emission rates listed are for informational purposes only.

According to the application, the project will emit approximately 757 tons per year (TPY) of NO<sub>x</sub>, 701 TPY of CO, 93 TPY of VOC, 105 TPY of SO<sub>2</sub>, 12 TPY of SAM and 264 TPY of PM/PM<sub>10</sub>.

**APPENDIX BD**  
**BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)**

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**BACT DETERMINATION PROCEDURE:**

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

- Any Environmental Protection Agency determination of BACT pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 - Standards of Performance for New Stationary Sources or 40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants.
- All scientific, engineering, and technical material and other information available to the Department.
- The emission limiting standards or BACT determination of any other state.
- The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine, for the emission unit in question, the most stringent control available for a similar or identical emission unit or emission unit category. If it is shown that this level of control is technically or economically unfeasible for the emission unit in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

Since this project is not subject to PSD or BACT for NO<sub>x</sub>, a related technology review will not be covered herein. This is discussed in detail within the Technical Evaluation and Preliminary Determination, including the details of a federally enforceable facility-wide cap.

**STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES:**

The minimum basis for a BACT determination is 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines (NSPS). Subpart GG was adopted by the Department by reference in Rule 62-204.800, F.A.C. The key emission limits required by Subpart GG are 75 ppm NO<sub>x</sub> @15% O<sub>2</sub>. (assuming 25 percent efficiency) and 150 ppm SO<sub>2</sub> @15% O<sub>2</sub> (or <0.8% sulfur in fuel). The NO<sub>x</sub> emission rate proposed by Gulf complies with Subpart GG NSPS which allows NO<sub>x</sub> emissions of approximately 110 ppm for the high efficiency unit to be purchased.

The 275 MMBtu duct burners required for supplementary gas-firing of the HRSGs are subject to 40 CFR 60, Subpart Da, Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978. The NO<sub>x</sub> emission rate proposed by Gulf is nearly half of the key historically applicable NSPS requirement of 0.20 pounds of NO<sub>x</sub> per million Btu heat input (lb. NO<sub>x</sub>/MMBtu). It is well below the revised Subpart Da output-based limit of 1.6 lb. NO<sub>x</sub>/MW-hr promulgated on September 3, 1998. No National Emission Standards for Hazardous Air Pollutants exist for stationary gas turbines or gas-fired duct burners.

**APPENDIX BD**  
**BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)**

**DETERMINATIONS BY EPA AND STATES:**

The following table is a sample of information on recent limitations set by EPA and the States for comparable stationary gas turbine.

Project Location	Power Output and Duty	CO - ppm (or lb./MMBtu)	VOC - ppm (or lb./MMBtu)	PM - lb./MMBtu (or gr./dscf or lb./hr)	Technology and Comments
Lakeland, FL	350 MW CC	25 - NG or 10 by Ox Cat 75 - FO @ 15% O <sub>2</sub>	4 - NG 10 - FO	10% Opacity	Clean Fuels Good Combustion
Mid-GA Cogen.	308 MW CC	10 - NG 30 - FO	6 - NG 30 - FO	18 lb./hr - NG 55 lb./hr - FO	Clean Fuels Good Combustion
Fort Myers, FL	1500 MW CC	12 - NG @15% O <sub>2</sub>	1.4 - NG	10% Opacity	Clean Fuels Good Combustion
Tiger Bay, FL	270 MW CC	0.045 lb./MMBtu-NG 0.053 lb./MMBtu-FO		0.053 - NG 0.009 - FO	Clean Fuels Good Combustion
Hines Polk, FL	485 MW CC	25 - NG 30 - FO	7 - NG 7 - FO	0.006 - NG 0.01 - FO	Clean Fuels Good Combustion
Tallahassee, FL	260 MW CC	25 - NG 90 - FO			Clean Fuels Good Combustion
Eco-Electrica, PR	461 MW CC	33 - NG/LPG @15% O <sub>2</sub> 33 - FO @15% O <sub>2</sub>	1.5/2.5 - NG/LPG 6 - FO	0.0053 - NG/LPG 0.0390 - FO	Clean Fuels Good Combustion
Sithe/IPP, NY	1012 MW CC	13 - NG		10% Opacity	Clean Fuels Good Combustion
Hermiston, OR	474 MW CC	15 - NG			Clean Fuels Good Combustion
Duke, FL	500 MW CC	12 - NG	1.4 - NG	10% Opacity	Clean Fuels Good Combustion
Barry, AL	800 MW CC	0.034 lb./MMBtu - NG/CT 0.057 lb./MMBtu - CT/DB	0.015 lb./MMBtu After CT / DB	0.011 lb./MMBtu CT/DB- 10% Op.	Gas Only Good Combustion

CC = Combined Cycle      CON = Continuous      DLN = Dry Low NO<sub>x</sub> Combustion      GE = General Electric  
 DB = Duct Burner      HSCR = Hot SCR      SCR = Selective Catalytic Reduction      WH = Westinghouse  
 NG = Natural Gas      FO = Fuel Oil      LPG = Liquefied Propane Gas      ABB = Asea Brown Bovari  
 CT = Combustion Turbine      ISO = 59°F      WI = Water or Steam Injection      ppm = parts per million

**OTHER INFORMATION AVAILABLE TO THE DEPARTMENT:**

Besides the information submitted by the applicant and that mentioned above, other information available to the Department consists of:

- Letter from EPA Region IV dated August 11, 1998
- DOE website information on Advanced Turbine Systems Project
- Alternative Control Techniques Document - NO<sub>x</sub> Emissions from Stationary Gas Turbines
- General Electric 39th Turbine State-of-the-Art Technology Seminar Proceedings
- GE Power Generation - Speedtronic™ Mark V Gas Turbine Control System
- GE Combined Cycle Startup Curves

**APPENDIX BD**  
**BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)**

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**COMBUSTION TURBINE AND DUCT BURNER CONTROL TECHNOLOGIES:**

The applicant presented an analyses of the different available control technologies for all of the pollutants subject to PSD review and a BACT determination. Technologies for control of pollutants other than NO<sub>x</sub> are discussed herein.

**Carbon Monoxide (CO) Control**

CO is emitted from combustion turbines due to incomplete fuel combustion. Combustion design and catalytic oxidation are the control alternatives that are viable for the project. The most stringent control technology for CO emissions is the use of an oxidation catalyst.

Most installations using catalytic oxidation are located in the Northeast. Among them are the 272 Berkshire, Massachusetts facility, 240 MW Brooklyn Navy Yard Facility, the 240 MW Masspower facility, the 165 MW Pittsfield Generating Plant in Massachusetts, and the 345 MW Selkirk Generating Plant in New York. However, catalytic oxidation was recently installed at a cogeneration plant at Reedy Creek (Walt Disney World), Florida to avoid PSD review which would have been required due to increased operation at low load. Additionally, Seminole Electric recently proposed catalytic oxidation in order to meet the permitted limit at its planned 244 MW Westinghouse 501FD combined cycle unit in Hardee County, Florida.

Most combustion turbines incorporate good combustion to minimize emissions of CO. These installations typically achieve emissions between 10 and 30 ppm at full load, even as they achieve relatively low NO<sub>x</sub> emissions by SCR or dry low NO<sub>x</sub> means. By comparison, the CT value of 13 ppm baseload proposed by Gulf appears relatively low, but consistent with the capabilities of DLN-2.6 technology as discussed above. This proposed limits are achievable through good combustion practice. When simultaneously operating the combustion turbine and the duct burner, CO emissions will be 16 ppm or less and with steam augmentation up to 23 ppm. This is within the range of limits set for combustion turbines operating alone. Annual emissions of CO are expected to be at a maximum of 701 tons per year for all operating modes combined.

**Volatile Organic Compound (VOC) Control**

Volatile organic compound (VOC) emissions, like CO emissions, are formed due to incomplete combustion of fuel. There are no viable add-on control techniques as the combustion turbine itself is very efficient at destroying VOC. The applicant has proposed good combustion practices to control VOC for both the turbine and the duct burner. The CT proposed emissions are 3 ppm. According to GE, even lower VOC emissions were achieved during recent tests of the DLN-2.6 technology when firing natural gas.<sup>1</sup> VOC emissions will be 6 ppm or less for simultaneous operation of the combustion turbines, duct burners firing and steam augmentation.

**Particulate Matter (PM/PM<sub>10</sub>) Control**

Particulate matter is generated by various physical and chemical processes during combustion and will be affected by the design and operation of the NO<sub>x</sub> controls. The particulate matter emitted from this unit will mainly be less than 10 microns in diameter (PM<sub>10</sub>). Natural gas will be the only fuel fired and is efficiently combusted in gas turbines. Clean fuels are necessary to avoid damaging turbine blades and other components already exposed to very high temperature and pressure.

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Natural gas is an inherently clean fuel and contains no ash. A technology review indicated that the top control option for PM<sub>10</sub> is a combination of good combustion practices, fuel quality, and filtration of inlet air. This has been chosen as BACT by the applicant, the Department concurs. Annual emissions of PM/PM<sub>10</sub> are expected to be a maximum of 264 tons per year for simultaneous operation of the combustion turbines, duct burners firing and steam augmentation in combination with the cooling tower.

Drift eliminators shall be installed on the salt-water cooling tower to reduce PM/PM<sub>10</sub>. The drift eliminators shall be designed and maintained to reduce drift to 0.001 percent of the circulating water flow rate. No PM testing is required because the Department's Emission Monitoring Section has determined that there is no appropriate PM test method for this type of cooling tower.

**BACKGROUND ON SELECTED GAS TURBINE AND DUCT BURNER**

Gulf Power has purchased two 170 MW General Electric MS7241FA gas turbines and two HRSGs with duct burners to drive a steam turbine-electrical generator.

The first commercial GE 7F Class unit was installed at the Virginia Power Chesterfield Station in 1990.<sup>2</sup> The initial units had a firing temperature of 2300°F and a combined cycle efficiency exceeding 50 percent. By the mid-90s, the line was improved by higher combustor pressure, a firing temperature of 2400°F, and a combined cycle efficiency of approximately 56 percent based on a 167 MW combustion turbine. The line was redesignated as the 7FA Class.

The first GE 7F/FA project in Florida was at the FPL Martin Plant in 1993 and entered commercial service in 1994.<sup>3</sup> The units were equipped with DLN-2 combustors with a permitted NO<sub>x</sub> limit of 25 ppmvd. These actually achieved emissions of 13-25 ppmvd of NO<sub>x</sub>, 0-3 ppm of CO, and 0-0.17 ppm of VOC.<sup>4</sup> The City of Tallahassee recently received approval to install a GE 7FA Class unit at its Purdom Plant.<sup>5</sup> Although permitted emissions are 12 ppmvd of NO<sub>x</sub>, the City obtained a performance guarantee from GE of 9 ppmvd.<sup>6</sup> FPL also obtained a guarantee and permit limit of 9 ppmvd NO<sub>x</sub> for six GE 7241FA turbines to be installed at the Fort Myers Repowering project.<sup>7</sup> The Santa Rosa Energy Center in Pace, Florida also received a permit with a 9 ppmvd NO<sub>x</sub> limit for a GE 7241 turbine with DLN-2.6 burners.<sup>8</sup>

Most recently, the Department issued draft BACT determinations for the simple cycle Oleander project in Brevard County and the TEC project in Polk County. The Department also issued draft permits for combined cycle projects in Volusia (Duke Energy), and Osceola (Kissimmee Utilities), and Palm Beach (Lake Worth). Four of these draft permits also include NO<sub>x</sub> limits of 9 ppmvd based on the DLN-2.6 technology installed on F Class units. The TEC simple cycle project has a requirement to meet the "new and clean" guarantee emission limit of 9 ppmvd, but is only required to comply with a limit of 10.5 ppmvd based on CEMS thereafter.

GE's approach of progressively refining such technology is a proven one for the large frame units. Recently GE Frame 7FA units met performance guarantees of 9 ppmvd with "DLN-2.6" burners at Fort St. Vrain, Colorado and Clark County, Washington.<sup>9</sup> Although the permitted limit is 15 ppmvd, GE has already achieved emission levels of approximately 6-7 ppmvd on gas at a dual-fuel 7EA (120 MW combined cycle) KUA Cane Island Unit 2.<sup>10</sup> Unit 2 is equipped with DLN-2 combustors. According to GE, similar performance is expected soon on the 7FA line such as the ones that will be installed for the Gulf Power Lansing Smith Project. Performance guarantees less

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than 9 ppmvd can be expected using the DLN-2.6 combustors for units delivered in a couple of years.<sup>11</sup>

General Electric, other manufacturers, and their customers are relying on further advancement and refinement of DLN technology to provide sufficient NO<sub>x</sub> control for their combined cycle turbines in Florida. Caution is still advised, however, based on some unexpected setbacks in GE's line of smaller aero-derivative units. Where required by BACT determinations of certain states, General Electric incorporates SCR in combined cycle projects.<sup>12</sup>

Although Smith Unit 3 is not subject to a PSD review for NO<sub>x</sub>, the 9 ppm NO<sub>x</sub> emission rate on natural gas (10.6 ppm while firing duct burners) requested by Gulf is comparable with recent BACT determinations for F Class combined cycle units, such as those previously listed.

**DEPARTMENT BACT DETERMINATION**

Following are the BACT limits determined for the Gulf project assuming full load. The emission limits or their equivalents in terms of NSPS units, as well as the applicable averaging times, are given in the permit Specific Conditions No. 19 through 24.

POLLUTANT	CONTROL TECHNOLOGY	PROPOSED BACT LIMIT
PM/PM <sub>10</sub> , VE	Pipeline Natural Gas Good Combustion	10 Percent Opacity
VOC	As Above	4 ppm @ 15% O <sub>2</sub> (CT and DB on) <sup>1</sup> 6 ppm @ 15% O <sub>2</sub> (DB and Stm. Aug.)
CO	As Above	16 ppm @ 15% O <sub>2</sub> (CT and DB on) <sup>1</sup> 23 ppm @ 15% O <sub>2</sub> (DB and Stm. Aug.)
SO <sub>2</sub> /SAM	As Above	2 gr/100 scf – pipeline quality gas
Cooling Tower PM	Drift Eliminators	.001 gallons/100 gallons recirculation flow (equivalent to 18.2 lb/hr PM) <sup>2</sup>

<sup>1</sup> Permit will be issued for 8760 hours of "CT and DB on".

<sup>2</sup> Listed for informational purposes only.

**RATIONALE FOR DEPARTMENT'S DETERMINATION**

- Gulf can obtain a guarantee from GE for DLN-2.6 combustors which have been demonstrated to meet all of the above limits on a 7FA Class gas turbine.
- The turbine emission limits with the duct burners on or off comply with the NSPS and are less than or equal to recent Department BACT determinations applicable to new units at start-up.
- Although the project will "net out" of PSD review for NO<sub>x</sub>, emission limits will be incorporated into the permit.
- PM<sub>10</sub> emissions will be very low and difficult to measure. The Department will set a visible emission standard of 10 percent opacity.
- CO emissions from Gulf's project are typical (approximately 11 ppm). The Department will set CO limits achievable by good combustion equal to 16 ppm with duct burners on. Although this unit will fire no oil, short-term emission limits of up to 23 ppm are considered reasonable. The Department will require annual testing as per specific permit conditions.

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- VOC emissions of 3 ppm proposed by Gulf are typical values of prior determinations of BACT. Good Combustion is sufficient to achieve these low levels with the DLN-2.6 combustors while firing natural gas. A maximum VOC emission limit of 6 ppm while firing duct burners and utilizing steam augmentation for up to 1000 hours per year is determined to be BACT.
- Gulf evaluated the use of an oxidation catalyst designed for 80 percent reduction and having a three-year catalyst life. The oxidation catalyst control system was estimated by Gulf to increase the total capital cost of the project by \$2,605,195. Gulf estimated levelized costs for CO catalyst control at about \$1,600 per ton to control CO emissions to 140 TPY (from 701 TPY).
- BACT for PM<sub>10</sub> was determined to be good combustion practices consisting of: inlet air filtering; use of pipeline natural gas; and operation of the unit in accordance with the manufacturer-provided manuals.
- PM<sub>10</sub> emissions will be very low and difficult to measure. Therefore, the Department will set a Visible Emission standard of 10 percent opacity consistent with the definition of BACT. Examples of installations with similar VE limits include the City of Lakeland, the City of Tallahassee, and the FPL Fort Myers projects in Florida as well as the Barry, Alabama project.

**COMPLIANCE PROCEDURES**

POLLUTANT	COMPLIANCE PROCEDURE
Visible Emissions	Method 9
Volatile Organic Compounds	Method 18, 25, or 25A (initial tests only)
Carbon Monoxide	Annual Method 10 (can use RATA as described in permit)
NO <sub>x</sub> (30-day average)	NO <sub>x</sub> CEMS, O <sub>2</sub> or CO <sub>2</sub> diluent monitor, and flow device as needed
NO <sub>x</sub> (performance)	Method 20 (initial test only)

**BACT EXCESS EMISSIONS APPROVAL**

Pursuant to the Rule 62-210.700 F.A.C., the Department through this BACT determination will not provide for allowances for excess emissions. The applicant will be afforded the ability to demonstrate NO<sub>x</sub> compliance on a 30-day rolling average due to netting out of PSD. The Department (in consultation with the EPA) believes that this lengthy averaging period provides ample opportunity for the applicant to accommodate all excess emissions.

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**DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:**

Michael P. Halpin, P.E., Review Engineer  
Department of Environmental Protection  
Bureau of Air Regulation  
2600 Blair Stone Road  
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*M.P. Halpin* P.E.

Recommended By:

Approved By:

*for* *C.H. Fancy* 7/25  
C. H. Fancy, P.E., Chief  
Bureau of Air Regulation

*Howard L. Rhodes*  
Howard L. Rhodes, Director  
Division of Air Resources Management

Date: \_\_\_\_\_

Date: 7/25/00

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**BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)**

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**References**

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- <sup>1</sup> Telecon. Vandervort, C., GE, and Linero, A. A., DEP. "VOC Emissions from FA Gas Turbines with DLN-2.6 Combustors."
- <sup>2</sup> Brochure. General Electric. "GE Gas Turbines - MS7001FA." Circa 1993.
- <sup>3</sup> Davis, L.B., GE. "Dry Low NO<sub>x</sub> Combustion Systems for GE Heavy Duty Gas Turbines." 1994.
- <sup>4</sup> Report. Florida Power & Light. "Final Dry Low NO<sub>x</sub> Verification Testing at Martin Combine Cycle Plant." August 7, 1995.
- <sup>5</sup> Florida DEP. PSD Permit, City of Tallahassee Purdom Unit 8. May, 1998.
- <sup>6</sup> City of Tallahassee. PSD/Site Certification Application. April, 1997.
- <sup>7</sup> Florida DEP. Intent to Issue Permit. FPL Fort Myers Repowering Project. September, 1998.
- <sup>8</sup> Florida DEP. Final Permit. Santa Rosa Energy Center. December, 1998.
- <sup>9</sup> Telecon. Schorr, M., GE, and Costello, M., Florida DEP. March 31, 1998. Status of DLN-2.6 Program
- <sup>10</sup> Florida DEP. Bureau of Air Regulation Monthly Report. June, 1998.
- <sup>11</sup> Telecon. Schorr, M., GE, and Linero, A.A., Florida DEP. August, 1998. Cost effectiveness of DLN versus SCR.
- <sup>12</sup> State of Alabama. PSD Permit, Alabama Power/Barry Site/IPP (GE 7FA).