

Golder Associates Inc.

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October 8, 2002

Mr. A. A. Linero, P.E. Administrator
New Source Review Section
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

RECEIVED

0137609

OCT 10 2002

BUREAU OF AIR REGULATION

RE: FPL MARTIN EXPANSION PROJECT
EPA COMMENTS TO DRAFT PERMIT
PROJECT NO. 085001-010-AC (PSD-FL-327)

Attention: Mr. Jeffery Koerner, P.E.

Dear Jeff:

This correspondence provides information requested by EPA Region IV regarding the technical feasibility of using the conventional SCR system during simple cycle operation by reducing the temperature of the exhaust gases. One method mentioned by EPA Region IV is to reduce the exhaust temperature using ambient air. This method is the only method currently used to reduce the exhaust gas temperature of combustion turbines for the installation of "Hot SCR" systems on some simple cycle turbines.

The Martin Unit 8 Project will be designed as a "4-on-1" combined cycle unit. Simple cycle operation will only occur for Units 8A and 8B prior to conversion to combined cycle and potentially for Units 8C and 8D. Units 8A and 8B are existing simple cycle units that will be converted to combined cycle mode. Simple cycle operation for Units 8C and 8D would potentially occur during the first year of operation of the combustion turbines (CTs). When the Martin Unit 8 combined cycle unit is operational, simple cycle operation without the SCR system operating would potentially average 1,000/CT for the four CTs. This would only occur if the heat recovery steam generator (HRSG)/CT systems or steam turbine were not operational for an extended period. The SCR systems would be internal to the HRSG at a location where the temperature of the air stream was about 650 degrees Fahrenheit (°F). The HRSG would provide the necessary cooling of the CT exhaust gases to 650°F by extracting heat from the high-temperature CT exhaust gases (typically 1,100 to 1,200°F) and producing steam.

In the event simple cycle operation (i.e., exhaust through a simple cycle stack without going through the HRSG) is maintained, it would not be technically feasible to use the conventional SCR and still maintain normal combined cycle operation. While this may be theoretically possible, such a design would not be technically feasible for the project for the reasons summarized below:

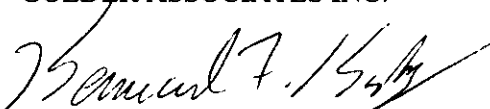
- To use the SCR system in each HRSG, the exhaust gases would have to be cooled prior to the CT/HRSG transition, mixed, and uniformly distributed prior to the SCR system. This would require a large flue duct system that would not fit within any practical arrangement of a 4-on-1 combined cycle unit.

- The HRSG tubes would have to withstand 650°F while not producing steam (i.e., dry). This would require material upgrades that would affect overall performance in combined cycle mode. Moreover, the reason that simple cycle may be used would be some malfunction of the HRSG. Such malfunctions (e.g., repair of tube leaks) would require work directly in the HRSG and, thus, operation in simple cycle could not occur. If only one CT/HRSG train was inoperable, Martin Unit 8 could still be operated in combined cycle mode using three CT/HRSG trains. Finally, experience with the existing FPL combined cycle units (Martin Units 3 and 4 and Lauderdale Units 4 and 5) have demonstrated that the steam turbines are rarely shutdown for extended periods, making simple cycle operation very unlikely.
- Introducing cooled exhaust air through the SCR system and only a portion of the HRSG would not be feasible. Any cooled CT exhaust gases routed around the HRSG sections prior to the ammonia injection grid and into the SCR catalyst would have to flow parallel to the HRSG. The SCR catalyst is directional and it would not be possible to properly distribute exhaust gases in such a configuration.
- A temperature reduction of about 450°F in the CT exhaust temperature has not been demonstrated on any CT exhaust using an "F" Class turbine. The amount of cooling air would be about 25 percent of the CT exhaust flow and require large air injection fans. The large amount of air required would substantially increase the pressure drop for all systems. Finally, the SCR system itself would be larger to accommodate the large mass flow. In combined cycle mode, these factors would significantly affect the performance of the unit.

Please contact me if there are any questions.

Sincerely,

GOLDER ASSOCIATES INC.



Kennard F. Kosky, P.E.
Principal

KFK/nav

cc: K. H Simmons, Manager of New Capacity Projects

C. Halladay
P:\Projects\2001\0137609 FPL Fort Myers-Martin-Manatee\4.1\100802.doc

B. Orum
J. Sittle, SED
O. Kettle, EPA
G. Pennypacker, NPS

HOPPING GREEN & SAMS

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Writer's Direct Dial No.
(850) 425-2320

September 27, 2002

Mr. A. A. Linero, P.E.
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

RECEIVED

SEP 27 2002

BUREAU OF AIR REGULATION

Re: Florida Power & Light Co., Martin Unit 8
OGC Case No. 02-1209
PSD Permit No. PSD-FL-327
Project No. 0850001-010-AC

Dear Al:

Enclosed for your files are the original Proofs of Publication from the Indiantown News and The Stuart News for the above-referenced Public Notice of Intent to Issue PSD Permit for the FPL Martin Power Plant, New Combined Cycle Unit 8 in Martin County, Florida. Both notices were published on September 12, 2002.

Please do not hesitate to call me if you have any questions concerning the above.

Sincerely,



Douglas S. Roberts

Encls.

cc: Jeff Koerner (w/o attachments)
Ken Simmons (w/attachments)

J. Little, SECD
B. Brown, DEP
D. DeWitt, NPS
A. Little, EPA

AFFIDAVIT OF PUBLISHER

Indiantown News
P.O. Box 1080, Indiantown, Fl 34956
(561) 597-4243
Published Weekly

STATE OF FLORIDA
COUNTY OF MARTIN

Before the undersigned authority personally appeared J.W. Owens who on oath says that he is publisher of the Indiantown News, a newspaper published weekly at Indiantown in Indiantown, Florida:

that the attached copy of advertisement,
being a Public Notice of Intent to Issue PSD Permit
in the matter of FPI Martin Power Plan, New Combined Cycle Unit 8
via: Gail Steels
Hopping, Green & Sams
123 S. Calhoun Street
Tallahassee, FL 32301

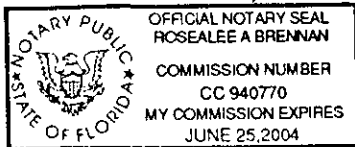
In the _____ Court,
was published in said newspaper in the issues of 09/12/2002

Affiant further says that the said Indiantown News is a newspaper published at Indiantown, in said Martin County, Florida, and that said newspaper has heretofore been continuously published in said Indiantown, Florida as a daily, weekly, or bi-weekly and has been entered as second class mail matter at the post office in Indiantown, in said Martin County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

J. W. Owens, (Publisher)
Sworn to and subscribed before me
this 12th day of September
A.D. 2002

Roselee A. Brennan
Notary Public

(SEAL)



RECEIVED

SEP 27 2002

BUREAU OF AIR REGULATION

PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Draft Permit No. PSD-FL-327

FPL Martin Power Plant, New Combined Cycle Unit 8
Martin County

The Department of Environmental Protection (Department) gives notice of its intent to issue a permit under the requirements for the Prevention of Significant Deterioration (PSD) of Air Quality to the Florida Power and Light Company. The permit is one of several authorizations needed to construct a nominal 1150 MW combined cycle gas project at the FPL Martin Power Plant, which is located approximately 7 miles north of Indiantown on State Road 710 in Martin County, Florida. In accordance with Rule 62-212.400, F.A.C. and 40 CFR 52.21, Best Available Control Technology (BACT) determinations were required for emissions of carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM/PM10), sulfur dioxide (SO2), sulfuric acid mist (SAM), and volatile organic compounds (VOC). The applicant's authorized representative is Mr. John M. Lindsay, Plant General Manager. The applicant's address is FPL Martin Power Plant, P.O. Box 176, Indiantown, FL 34956.

The applicant proposes to construct a "4-on-1" combined cycle Unit 8 consisting of the following equipment and specifications: two existing 170 MW simple cycle gas turbine-electrical generator sets (8A and 8B), two new 170 MW gas turbine-electrical generator sets (8C and 8D), four gas-fired heat recovery steam generators (495 MMBtu/hour, LHV), a common steam-electrical generator (470 MW), two new gas-fired fuel heaters (22 MMBtu/hour, each), a cooling tower, and other associated support equipment. The gas turbines will be fired primarily with natural gas and up to 500 hours per year of very low sulfur distillate oil as a restricted alternate fuel. For the first year of operation, each gas turbine may operate in simple cycle mode for 3390 hours per year while the combined cycle components are constructed. Once combined cycle operation is established, simple cycle operation is limited to an average of 1000 hours per year. Additional equipment includes four 120-foot stacks combined cycle stacks, four 80-foot simple cycle stacks, and an aqueous ammonia storage tank.

During simple cycle operation and gas firing, NOx emissions will be controlled by dry low-NOx combustion technology. During simple cycle operation and oil firing, NOx emissions will be controlled by wet injection techniques. During the predominant combined cycle operation, a selective catalytic reduction (SCR) system with ammonia injection will be used in conjunction with dry low-NOx combustion (gas firing) and wet injection (oil firing) to further reduce NOx emissions. To meet peak power demands, the following alternate methods of operation will be authorized: high-temperature peaking (60 hours/year for simple cycle and 400 hours/year for combined cycle operation); steam injection for power augmentation (400 hours/year); and duct burning (2880 hours/year). During these restricted alternate methods of operation, NOx emissions are slightly higher. Emissions of CO, PM/PM10, SAM, SO2, and VOC will be minimized by the efficient, high-temperature combustion of very low sulfur fuels (natural gas and distillate oil). Emissions of CO and NOx will be continuously monitored to demonstrate compliance with the conditions of the permit. The Department determines that these control techniques and equipment represent the Best Available Control Technology (BACT) in accordance with Rule 62-212.400, F.A.C. and 40 CFR 52.21. Emissions standards are presented in the draft permit on file with the Department.

Based on the initial application, the maximum potential annual emissions from the combined cycle gas turbines, the gas fired-fuel heaters, and the cooling tower that comprise new Unit 8 are summarized in the following table. It is noted that some of the annual emissions estimates will be less because of lower standards specified in the DRAFT permit.

Pollutant	Maximum Tons Per Year	PSD Significant Emission Rate Tons Per Year	PSD Review Required?
CO	826	100	Yes
Pb	0.025	0.6	No
NOx	683	40	Yes
PM/PM10	322/275	15/25	Yes
SO2	280	40	Yes
SAM	30	7	Yes
VOC	110	40	Yes

According to the applicant, maximum predicted air quality impacts due to emissions from the proposed new project are less than the applicable PSD Class II significant impact levels, with the exception of 24-hour SO2 impacts. Therefore, multi-source modeling was only required for the 24-hour SO2 impacts. The predicted impacts in the Everglades National Park are less than the applicable PSD Class I significant impact levels except for the 24-hour SO2 impacts; therefore, multi-source Class I PSD increment modeling was only required for the 24-hour SO2 impacts. The following table summarizes the maximum predicted PSD Class I and II 24-hour SO2 increment consumed by the new project and by all increment-consuming sources.

Area and Averaging Time	Increment Consumed Project/All Sources (SO2, ug/m ³)		Allowable Increment All Sources (SO2, ug/m ³)
	Project/All Sources	(Percent)	
Class I, 24-hour (Everglades National Park)	0.4/3.5	5	8/70
Class II, 24-hour (Vicinity of Plant)	9/41	91	10/45

Based on the required analyses, the Department has reasonable assurance that the proposed project will not cause or significantly contribute to a violation of any ambient air quality standard or PSD increment. The Department will issue the FINAL Permit, in accordance with the conditions of the DRAFT Permit, unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for a public meeting concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of this Public Notice of Intent to Issue PSD Permit. Written comments or requests for public meetings should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. This PSD permitting action is being coordinated with a certification under the Power Plant Siting Act (Sections 403.501-519, F.S.). If a petition for an administrative hearing on the Department's Intent to Issue is filed by a substantially affected person, that hearing shall be consolidated with the certification hearing, as provided under Section 403.507(3). Mediation is not available in this proceeding.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C. Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Protection Bureau of Air Regulation 111 S. Magnolia Drive, Suite 4 (Mailing Address: 2600 Blair Stone Road, MS #5505)
Tallahassee, Florida 32399-2400 Telephone: 850/488-0114 Fax: 850/922-6979 Department of Environmental Protection
Southeast District Office 400 North Congress Avenue (Mailing Address: P.O. Box 15425) West Palm Beach, FL 33416-5425 Telephone: 561/681-6600
Fax: 561/681-6790

The complete project file includes the application, technical evaluations, Draft Permit, and the information submitted by the authorized representative, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Manager of the New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114 for additional information. The draft permit, technical evaluation and preliminary BACT determination can be accessed at www.dep.state.fl.us/air/permitting/construct.htm.



SCRIPPS TREASURE COAST PUBLISHING COMPANY

The Stuart News
The Port St. Lucie News

1939 S. Federal Highway, Stuart, FL 34994

AFFIDAVIT OF PUBLICATION

RECEIVED

SEP 27 2002

BUREAU OF AIR REGULATION

STATE OF FLORIDA

COUNTY OF MARTIN; COUNTY OF ST. LUCIE

Before the undersigned authority personally appeared, S. Darlene Mailing, who on oath says that she is Classified Inside Sales Manager of the Stuart News and the Port St. Lucie News, a daily newspaper published at Stuart in Martin County, Florida: that the attached copy of advertisement was published in the Stuart/Port St. Lucie News in the following issues below. Affiant further says that the said Stuart/Port St. Lucie News is a newspaper published in Stuart in said Martin County, Florida, with offices and paid circulation in Martin County and St. Lucie County, Florida, and that said newspapers have heretofore been continuously published in said Martin County, Florida, daily and distributed in Martin and St. Lucie County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that she has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper. The Stuart News has been entered as second class matter at the Post Offices in Stuart, Martin County, Florida and Ft. Pierce, St. Lucie County, Florida and has been for a period of one year next preceding the first publication of the attached copy of advertisement.

<u>Ad #</u>	<u>Customer Name</u>	<u>Pub Date</u>	<u>Copyline</u>	<u>PQ #</u>
2515577	HOPPING GREEN & SAMS	09/12/2002	PSD PERMIT/FPL	

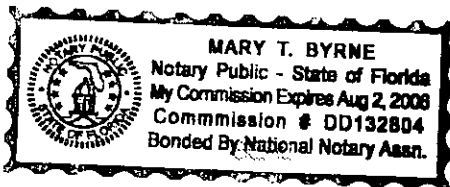
Subscribed and sworn to me before this date:

09/12/2002

S. Darlene Mailing

Mary T. Byrne

 Notary Public



PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT
 STATE OF FLORIDA
 DEPARTMENT OF ENVIRONMENTAL PROTECTION
 Draft Permit No. PSD-FL-327
 FPL Martin Power Plant, New Combined Cycle Unit 8
 Martin County

The Department of Environmental Protection (Department) gives notice of its intent to issue a permit under the requirements for the Prevention of Significant Deterioration (PSD) of Air Quality to the Florida Power and Light Company. The permit is one of several authorizations needed to construct a nominal 1150 MW combined cycle gas project at the FPL Martin Power Plant, which is located approximately 7 miles north of Indiantown on State Road 710 in Martin County, Florida. In accordance with Rule 62-212.400, F.A.C. and 40 CFR 52.21, Best Available Control Technology (BACT) determinations were required for emissions of carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM/PM10), sulfur dioxide (SO2), sulfuric acid mist (SAM), and volatile organic compounds (VOC). The applicant's authorized representative is Mr. John M. Lindsay, Plant General Manager. The applicant's address is FPL Martin Power Plant, P.O. Box 176, Indiantown, FL 34956.

The applicant proposes to construct a "4-on-1" combined cycle Unit 8 consisting of the following equipment and specifications: two existing 170 MW simple cycle gas turbine-electrical generator sets (8A and 8B), two new 170 MW gas turbine-electrical generator sets (8C and 8D), four gas-fired heat recovery steam generators (495 MMBtu/hour, LHV), a common steam-electrical generator (470 MW), two new gas-fired fuel heaters (22 MMBtu/hour, each), a cooling tower, and other associated support equipment. The gas turbines will be fired primarily with natural gas and up to 500 hours per year of very low sulfur distillate oil as a restricted alternate fuel. For the first year of operation, each gas turbine may operate in simple cycle mode for 3390 hours per year while the combined cycle components are constructed. Once combined cycle operation is established, simple cycle operation is limited to an average of 1000 hours per year. Additional equipment includes four 120-foot stacks combined cycle stacks, four 80-foot simple cycle stacks, and an aqueous ammonia storage tank.

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Based on the initial application, the maximum potential annual emissions from the combined cycle gas turbines, the gas fired-fuel heaters, and the cooling tower that comprise new Unit 8 are summarized in the following table. It is noted that some of the annual emissions estimates will be less because of lower standards specified in the DRAFT permit.

Pollutant	Maximum Tons Per Year	PSD Significant Emission Rate Tons Per Year	PSD Review Required?
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According to the applicant, maximum predicted air quality impacts due to emissions from the proposed new project are less than the applicable PSD Class II significant impact levels, with the exception of 24-hour SO2 impacts. Therefore, multi-source modeling was only required for the 24-hour SO2 impacts. The predicted impacts in the Everglades National Park are less than the applicable PSD Class I significant impact levels except for the 24-hour SO2 impacts; therefore, multi-source Class I PSD increment modeling was only required for the 24-hour SO2 impacts. The following table summarizes the maximum predicted PSD Class I and II 24-hour SO2 increment consumed by the new project and by all increment-consuming sources.

Area and Averaging Time	Increment Consumed Project/All Sources (SO2, ug/m3)	Allowable Increment All Sources (SO2, ug/m3)	Increment Consumed Project/All Sources (Percent)
Class I, 24-hour (Everglades National Park)	0.4/3.5	5	8/70
Class II, 24-hour (Vicinity of Plant)	9/41	91	10/45

Based on the required analyses, the Department has reasonable assurance that the proposed project will not cause or significantly contribute to a violation of any ambient air quality standard or PSD increment. The Department will issue the FINAL Permit, in accordance with the conditions of the DRAFT Permit, unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for a public meeting concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of this Public Notice of Intent to Issue PSD Permit.

Written comments or requests for public meetings should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

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Under section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

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Department of Environmental Protection
Bureau of Air Regulation
111 S. Magnolia Drive, Suite 4
(Mailing Address: 2600 Blair Stone Road, MS #5505)
Tallahassee, Florida 32399-2400
Telephone: 850/488-0114
Fax: 850/922-6979

Department of Environmental Protection
Southeast District Office
400 North Congress Avenue
(Mailing Address: P.O. Box 15425)
West Palm Beach, FL 33416-5425
Telephone: 561/681-6600
Fax: 561/681-6790

The complete project file includes the application, technical evaluations, Draft Permit, and the information submitted by the authorized representative, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Manager of the New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114 for additional information. The draft permit, technical evaluation and preliminary BACT determination can be accessed at www.dep.state.fl.us/air/permitting/construct.htm.
Publish: September 12, 2002

2515577

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603



RECEIVED

August 19, 2002

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BUREAU OF AIR REGULATION

Mr. C. H. Fancy, P.E., Chief
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

RE: FPL MARTIN EXPANSION PROJECT
Comments to Draft Permit
Project No. 085001-010-AC (PSD-FL-327)

Attention: Mr. A.A. Linero, P.E., Administrator, New Source Review Section

Dear Al:

On behalf of Mr. John Lindsay of Florida Power & Light Company, I am submitting comments to the July 30, 2002 draft Air Permit and Prevention of Significant Deterioration (PSD) Permit for the FPL Manatee Expansion Project. The comments to the draft permit have been included directly on an electronic version of the permit. The comments included suggested changes to permit conditions as well as specific comments related to the reasons for the suggested change. If some of these changes are acceptable to the Department, there will also be some minor changes to the Public Notice and BACT determination.

As we discussed on August 8, 2002, most of the comments are self-explanatory and provide clarifications of the draft permit. There are several areas, summarized below, where changes are required to allow the Project to meet both performance and environmental goals.

- Duct Firing – A limit on the hours of operation for duct firing (i.e., 2,880) will not provide the operational flexibility for the Project as was requested in the original permit application. An annual heat input limit based on the maximum permitted heat input to the duct burners (550 MMBtu/hr) and a hypothetical number of hours (2,880) at that heat input rate was originally requested. The maximum heat input to the duct burners provided a worst case emission rate for modeling and the number of hours enveloped the amount of duct firing based on heat input. With an annual heat input limit, the annual emissions proposed for the project will not change regardless of the number of hours of duct firing.
- CO Emission Limit for Combined Cycle Operation – Based on our discussions on August 8, a 24-hour block CO emission limit of 10 ppmvd corrected to 15 percent oxygen is proposed for all modes of operation. This proposed limit is slightly higher than that proposed by the Department in the draft permit for baseload operation and duct firing, but lower than that proposed for peak and power augmentation. This limit will provide the operational flexibility regardless of the mode of operation and will be much easier to track for compliance purposes. Having two separate 24-hour block average CO limits for different combined cycle modes will confound the determination of compliance. Also, the proposed limit is 40 to 50 percent

lower than that approved by the Department for recent projects licensed under Florida's Power Plant Siting Act.

- Startup/Shutdown – Three specific conditions have been suggested to handle the unique startup conditions for a 4 on 1 project. The conditions are similar to those authorized for the Fort Myers and Sanford Repowering Projects. These suggested conditions would ensure reliability of equipment and minimize the periods of excess emissions. Information concerning the cold startup for the heat recovery steam generator was provided on August 8. Please find attached information as requested on August 8, concerning the cold startup of the steam turbine. The information provided demonstrates that the necessity of the suggested conditions.

Also, it is suggested that the appendices for 40 CFR Subpart Da and GG to the permit be the same for both the Manatee and Martin Expansion Projects. The appendices included with the Martin formed the basis of the suggested comments. Attached are the appendices including the suggested changes. Please note that if natural gas fired fuel gas heaters are constructed, they will be direct fired as included in the application and 40 CFR Part Dc would not apply. This appendix should be deleted.

Please contact either Mr. Simmons, the FPL application contact [phone (561) 691-2216], or myself if there are any questions. We will contact the Department in a few days to review our suggested draft permit changes.

Sincerely,

GOLDER ASSOCIATES INC.



Kennard F. Kosky, P.E.
Principal

KFK/arz

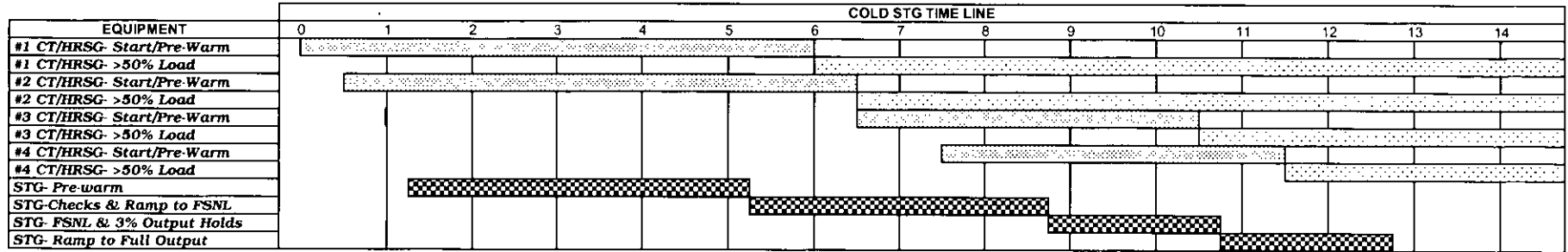
Enclosures

cc: John M. Lindsay, Plant General Manager Martin Plant w/enclosures
K. H Simmons, Manager of New Capacity Projects w/enclosures
Mr. Jeffery F. Koerner, P.E. DEP New Source Review Section w/enclosures

J. Dittler, SED
G:\Projects\2001\0137609 FPL Fort Myers-Martin-Manatee\4 Martin\4.2\4 2.1 Sufficiency AUG11.081902.doc

B. Worley, EPA
Sp. Reviewer, NPS
C. Fisher, DEP
B. Owen

**ESTIMATED START-UP TIMELINE FOR COLD STEAM TURBINE GENERATOR
MARTIN and MANATEE EXPANSION PROJECTS**



Notes:

Per Toshiba Extrapolated Start-Up Curve for the Forney Project (Similar STG)
 STG requires 4 1/2 hour warmup prior to roll, 3 1/2 hours to FSNL, 2 hours of holds, and 2 hours to ramp to full output.
 HRSG requires 90 minute ramp to hold pressure, 60 minute drum soak, and 60 minutes to ramp to full steam bypass operation.

DRAFT PERMIT

PERMITTEE:

Florida Power and Light Company
P.O. Box 176
Indiantown, FL 34956

FPL Martin Power Plant Project No. 0850001-010-AC Air Permit No. PSD-FL-327 SIC No. 4911 Expires: December 30, 2006 5
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Authorized Representative:

John M. Lindsay, Plant General Manager

[Comment: An expiration date of December 2006 is requested, since the project is being licensed within Florida's site certification process.]

PROJECT AND LOCATION

This permit authorizes the construction of Unit 8, a nominal 1150-megawatt "4-on-1" combined cycle unit at the existing Martin Power Plant. The project will utilize two existing 170 MW gas turbine-electrical generator sets and will add two new 170 MW gas turbine-electrical generator sets, four new heat recovery steam generators, a single nominal 470 MW steam turbine-electrical generator, gas-fired fuel heaters, and a mechanical draft cooling tower. The existing Martin Power Plant is located approximately 7 miles north of Indiantown on State Road 710 in Martin County, Florida.

STATEMENT OF BASIS

This PSD air pollution construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.) and Title 40, Part 52, Section 21 of the Code of Federal Regulations. Pursuant to Chapter 62-17, F.A.C. and Chapter 403 Part II, F.S., the project is also subject to Electrical Power Plant Siting and was therefore processed in accordance with Florida's delegated program for the Prevention of Significant Deterioration (PSD) of Air Quality. The permittee is authorized to install the proposed equipment 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.

CONTENTS

- Section I. General Information
- Section II. Administrative Requirements
- Section III. Emissions Units Specific Conditions
- Section IV. Appendices

(DRAFT)

Howard L. Rhodes, Director
Division of Air Resources Management

(Date)

SECTION I. GENERAL INFORMATION (DRAFT)

FACILITY DESCRIPTION

The existing Martin Power Plant currently consists of six electrical generating units. Fossil fuel-fired steam electric generators Units 1 and 2 (863 MW nominal each) began operation in 1980 and 1981, respectively. Combined cycle gas turbine Units 3A/3B and 4A/4B (430 MW nominal each) began operation in 1994. Existing simple cycle gas turbine Units 8A and 8B (170 MW nominal each) began operation in 2001. Units 8A and 8B will be incorporated into the new "4 on 1" combined cycle Unit 8, which will consist of two new gas turbine Units 8C and 8D (170 MW nominal each), four heat recovery steam generators, a single steam turbine-electrical generator (470 nominal MW), and a mechanical draft cooling tower. Unit 8 will have a total nominal generating capacity of 1150 MW. After completion of this project, the plant will have a nominal generating capacity of 3610 MW. [Comment: The use of "nominal" when discussion capacity is preferred as actual capacity varies based on operating conditions.]

NEW AND MODIFIED EMISSIONS UNITS

This permit authorizes construction and installation of the following new emissions units.

ID	Emission Unit Description
011	Unit 8A gas turbine (170 MW nominal) with heat recovery steam generator
012	Unit 8B gas turbine (170 MW nominal) with heat recovery steam generator
013	Gas-fired fuel heaters (two)
017	Unit 8C gas turbine (170 MW nominal) with heat recovery steam generator
018	Unit 8D gas turbine (170 MW nominal) with heat recovery steam generator
019	Mechanical draft cooling tower for Unit 8

Note: Martin Unit 8 consists of four gas turbine-electrical generator sets (Units 8A-8D), four gas-fired heat recovery steam generators (HRSGs), and a single steam-turbine electrical generator.

REGULATORY CLASSIFICATION

Title III: The existing facility is major for hazardous air pollutants (HAPs). This project is not major for HAPs.

Title IV: The facility operates emissions units subject to the acid rain provisions of the Clean Air Act.

Title V: Because potential emissions of at least one regulated pollutant exceed 100 tons per year, the existing facility is a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C. Regulated pollutants include pollutants such as carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM/PM₁₀), sulfur dioxide (SO₂), and volatile organic compounds (VOC).

PSD: The project is located in an area designated as "attainment" or "unclassifiable" for each pollutant subject to a National Ambient Air Quality Standard. The facility is considered a "fossil fuel fired steam electric plant of more than 250 million BTU per hour of heat input", which is one of the 28 PSD source categories with the lower PSD applicability threshold of 100 tons per year. Potential emissions of at least one regulated pollutant exceed 100 tons per year. Therefore, the facility is classified as a PSD-major source of air pollution with respect to Rule 62-212.400, F.A.C, the Prevention of Significant Deterioration (PSD) of Air Quality.

NSPS: The following New Source Performance Standards (NSPS) apply to this project: 40 CFR 60, Subpart Da (gas-fired duct burners); ~~40 CFR 60, Subpart Dc (gas-fired fuel heaters);~~ and 40 CFR 60, Subpart GG (gas turbines). [Comment: Direct fired fuel gas heaters are not subject to Subpart Dc since these type units do not meet the definition of "steam generating unit in Section 60.41c (i.e., produces steam or heat water or any other heat transfer medium).]

SECTION I. GENERAL INFORMATION (DRAFT)

NESHAP: No emissions units are identified as subject to any National Emissions Standards for Hazardous Air Pollutants (NESHAP).

Siting: The project is subject to Electrical Power Plant Siting in accordance with Chapter 62-17, F.A.C. and Chapter 403, Part II, F.S.

PERMITTING AUTHORITY

All documents related to applications for permits to construct, operate or modify an emissions unit shall be submitted to the Bureau of Air Regulation of the Florida Department of Environmental Protection (DEP) at 2600 Blair Stone Road (MS #5505), Tallahassee, Florida 32399-2400. Copies of all such documents shall also be submitted to the Compliance Authority.

COMPLIANCE AUTHORITY

All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Air Resources Section of the Southeast District Office, Florida Department of Environmental Protection, Post Office Box 15425, West Palm Beach, Florida 33416-5425.

APPENDICES

The following Appendices are attached as part of this permit.

- Appendix A. Citation Format and Definitions
- Appendix BD. Final BACT Determinations and Emissions Standards
- Appendix Da. NSPS Subpart Da Requirements for Gas-Fired Duct Burners
- Appendix Dc. NSPS Subpart Dc Requirements for Gas-Fired Fuel Heaters
- Appendix GC. Construction Permit General Conditions
- Appendix GG. NSPS Subpart GG Requirements for Gas Turbines
- Appendix SC. Standard Conditions

RELEVANT DOCUMENTS

The documents listed below are not a part of this permit; however, they are specifically related to this permitting action and are on file with the Department.

- Permit application received on 02/01/02 and all related completeness correspondence.
- Draft permit package issued on (Draft).
- Comments received from the public, the applicant, the EPA Region 4 Office, and the National Park Service.
- PSD Permit No. PSD-FL-286

SECTION II. ADMINISTRATIVE REQUIREMENTS (DRAFT)

1. General Conditions: The permittee shall operate under the attached General Conditions listed in Appendix GC of this permit. General Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]
2. Applicable Regulations, Forms and Application Procedures: Unless otherwise indicated in this permit, the construction and operation of the subject emissions unit shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403 of the Florida Statutes (F.S.); Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.); and the Title 40, Parts 51, 52, 60, 72, 73, and 75 of the Code of Federal Regulations (CFR), adopted by reference in Rule 62-204.800, F.A.C. The terms used in this permit have specific meanings as defined in the applicable chapters of the Florida Administrative Code. 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. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations. [Rules 62-204.800, 62-210.300 and 62-210.900, F.A.C.]
3. Construction and Expiration: The permit expiration date includes sufficient time to complete construction, perform required testing, submit test reports, and submit an application for a Title V operation permit to the Department. Approval to construct shall become invalid for any of the following reasons: construction is not commenced within 18 months after issuance of this permit; construction is discontinued for a period of 18 months or more; or 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. In conjunction with an extension of the 18-month period to commence or continue construction, or phasing of the project, ~~or an extension of the permit expiration date,~~ the Department may require the permittee to demonstrate the adequacy of any previous determination of Best Available Control Technology (BACT) for emissions units regulated by the project. For good cause, the permittee may request that this PSD air construction permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation at least sixty (60) days prior to the expiration of this permit. [Rules 62-4.070(4), 62-4.080, 62-210.300(1), and 62-212.400(6)(b), F.A.C.; 40 CFR 52.21(r)(2); 40 CFR 51.166(j)(4)](Comment: Suggested change consistent with FDEP rules.)
4. New or Additional Conditions: 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.]
5. Modifications: No emissions unit or facility subject to this permit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Chapters 62-210 and 62-212, F.A.C.]
6. Application for Title IV Permit: At least 24 months before the date on which the new unit begins serving an electrical generator greater than 25 MW, the permittee shall submit an application for a Title IV Acid Rain Permit to the Department's Bureau of Air Regulation in Tallahassee and a copy to the Region 4 Office of the U.S. Environmental Protection Agency in Atlanta, Georgia. [40 CFR 72]
7. Title V Permit: This permit authorizes construction of the permitted emissions units and initial operation to determine compliance with Department rules. A Title V operation permit is required for regular operation of the permitted emissions unit. The permittee shall apply for a Title V operation permit at least 90 days prior to expiration of this permit, but no later than 180 days after commencing operation. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be

SECTION II. ADMINISTRATIVE REQUIREMENTS (DRAFT)

submitted to the Department's Bureau of Air Regulation with a copy to the Compliance Authority. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

A. UNIT 8 – “4 ON 1” COMBINED CYCLE GAS TURBINE

This section of the permit addresses the following emissions units.

Emissions Units 011, 012, 017, 018

Description: Emissions units 011, 012, 017, and 018 each consist of a General Electric Model PG7241(FA) gas turbine-electrical generator set, an automated gas turbine control system, an inlet air filtration system, an evaporative inlet air-cooling system, a gas-fired heat recovery steam generator (HRSG), a bypass stack, a HRSG stack, and associated support equipment. In addition, the project also includes a single steam turbine-electrical generator that serves all four gas turbine/HRSG systems. Units 011 and 012 are subject to Permit No. PSD-FL-286, rather than this permit, until commencement of steam blows for conversion to combined cycle.[Comment: In some permit conditions a distinction between the existing the “new” gas turbines have been made.]

Fuels: Each gas turbine fires natural gas as the primary fuel and distillate oil as a restricted alternate fuel.

Generating Capacity: Each of the four gas turbine-electrical generator sets has a nominal generating capacity of 170 MW for gas firing (180 MW nominal for oil firing). Exhaust from each gas turbine passes through a separate heat recovery steam generator (HRSG). Steam from each HRSG is delivered to the single steam turbine-electrical generator, which has a nominal capacity of 470 MW. The total nominal generating capacity of the “4 on 1” combined cycle unit is 1150 MW.

Controls: The efficient combustion of natural gas and restricted firing of low sulfur distillate oil minimizes the emissions of CO, PM/PM₁₀, SAM, SO₂ and VOC. Dry low-NOx (DLN) combustion technology for gas firing and water injection for oil firing reduce NOx emissions during simple cycle operation. A selective catalytic reduction (SCR) system in combination with the other NOx controls further reduces NOx emissions during combined cycle operation.

Stack Parameters: Each gas turbine has a bypass stack (80 feet tall and 22.0 feet in diameter) and each heat recovery steam generator has a HRSG stack (120 feet tall and 19.0 feet in diameter). The following summarizes the exhaust characteristics:

Fuel

Heat Input Rate

Compressor
Inlet Temp.

Simple Cycle Operation

Combined Cycle Operation

Exhaust Temp.

Flow Rate
ACFM

Exhaust
Temp., °F

Flow Rate

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

A. UNIT 8 – “4 ON 1” COMBINED CYCLE GAS TURBINE

	<u>ACFM</u>
Gas	1600 MMBtu/hour 59° F 1116° F 2,389,500 202° F 1,004,200
Oil	1811 MMBtu/hour 59° F 1098° F 2,735,300 295° F 1,193,900

Continuous Monitors: Each stack is equipped with continuous emissions monitoring systems (CEMS) to measure and record CO and NOx emissions as well as flue gas oxygen or carbon dioxide content.

APPLICABLE STANDARDS AND REGULATIONS

1. **BACT Determinations:** Determinations of the Best Available Control Technology (BACT) were made for carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM/PM10), sulfuric acid mist (SAM), and sulfur dioxide (SO2), and volatile organic compounds (VOC). See Appendix BD of this permit for a summary of the final BACT determinations. [Rule 62-212.400(BACT), F.A.C.]
2. **NSPS Requirements:** The Department determines that compliance with the BACT emissions performance and monitoring requirements also assures compliance with the New Source Performance Standards for Subpart Da (duct burners) and Subpart GG (gas turbines) in 40 CFR 60. For completeness, the applicable Subpart GG and Subpart Da requirements are summarized in Appendices Dae and GG of this permit. [Rule 62-204.800(7), F.A.C.]

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

A. UNIT 8 – “4 ON 1” COMBINED CYCLE GAS TURBINE

EQUIPMENT

3. Gas Turbine Units 8C and 8D: The permittee is authorized to install, tune, operate, and maintain two new General Electric Model PG7241FA gas turbine-electrical generator sets each with a nominal capacity of 170 MW (EU 017 and 018). Each gas turbine shall include the Speedtronic™ automated gas turbine control system and have dual-fuel capability. Ancillary equipment includes an inlet air filtration system, an evaporative inlet air-cooling system, and a bypass stack for simple cycle operation ~~that is 80 feet tall and 22.0 feet in diameter~~. The gas turbines will utilize the “hot nozzle” DLN combustors, which require natural gas to be preheated to approximately 290° F before combustion to increase overall unit efficiency. Gas-fired fuel heaters (EU 013) will preheat the natural gas during simple cycle operation and during startup to combined cycle operation. For full combined cycle operation, feedwater heat exchangers will preheat the natural gas. *{Permitting Note: Two existing simple cycle General Electric Model PG7241FA gas turbine-electrical generator sets, Units 8A and 8B (EU 011 and 012), will be incorporated into the “4-on-1” combined cycle Unit 8.}* [Application; Design] [Comments: Stack parameters should not be included as a condition of the permit and to FPL’s knowledge has not been included as specific conditions in previous permits. During design, the stack diameter and height may be changed to meet specific needs. The stack parameters provided in the application generally represent worst case dispersion conditions and if any changes occur, FPL would provide additional modeling if requested by the Department.]
4. Gas Turbine NO_x Controls
 - a. *DLN Combustion*: The permittee shall operate and maintain the General Electric DLN 2.6 combustion system (or better) to control NO_x emissions from each gas turbine when firing natural gas. Prior to the initial emissions performance tests required for each new gas turbine, the DLN combustors and automated gas turbine control system shall be tuned to meet ~~the~~ ~~reduce~~ ~~NO_x emissions below~~ permitted levels. Thereafter, each system shall be maintained and tuned in accordance with the manufacturer’s recommendations. [Comment: The DLN-2.6 combustion system will be constructed and operated pursuant to GE specifications, which provide guaranteed emission levels for NO_x when firing gas. FPL has no contractual basis to request GE to deviate from the contract in attempting to achieve lower NO_x levels than the contract. Moreover, any attempt to lower contract NO_x levels below the contract levels could affect emissions of other air pollutants (e.g., CO and VOC).]
 - b. *Water Injection*: The permittee shall install, operate, and maintain a water injection system to reduce NO_x emissions from each gas turbine when firing distillate oil. Prior to the initial emissions performance tests required for new each gas turbine, the water injection system shall be tuned to meet ~~the~~ ~~reduce~~ ~~NO_x emissions below~~ permitted levels. Thereafter, each system shall be maintained and tuned in accordance with the manufacturer’s recommendations. The automated control system shall be programmed to establish a water-to-fuel ratio designed to meet the NO_x emission standard on a 1-hour basis. [Comment: The DLN-2.6 combustion system will be constructed and operated pursuant to GE specifications, which provide guaranteed emission levels for NO_x when firing oil. FPL has no contractual basis to request GE to deviate from the contract in attempting to achieve lower NO_x levels than the contract. Moreover, any attempt to lower contract NO_x levels below the contract levels could affect emissions of other air pollutants (e.g., CO and VOC).]
 - c. *(SCR) System*: The permittee shall install, tune, operate, and maintain a selective catalytic reduction (SCR) system to control NO_x emissions from each gas turbine during combined cycle operation when firing either natural gas or distillate oil. The SCR system consists of an ammonia injection grid, catalyst, aqueous ammonia storage, monitoring and control system, electrical, piping and other ancillary equipment. The SCR system shall be designed and operated to meet ~~the~~ ~~reduce~~ ~~NO_x emissions and~~ ammonia slip ~~below the~~ permitted levels. *{Permitting Note: The ammonia tank will store ~~aqueous~~*

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

A. UNIT 8 – “4 ON 1” COMBINED CYCLE GAS TURBINE

~~ammonia. having a concentration of less than 20 percent ammonia. In accordance with 40 CFR 60.130, it is not the storage of ammonia may be subject to the Chemical Accident Prevention Provisions of 40 CFR 68.~~ [Comments: Both aqueous and anhydrous ammonia may be used for the SCR system. The SCR system will be designed, constructed and operated to meet the emission levels specified in the permit for NO_x and ammonia slip. FPL will obtain contractual guarantees to meet these permitted emission levels. It is expected that the SCR manufacturer would include operating margin in the design. However, the term “below” as proposed in the draft permit must be removed since it is unknown what “below” means.]

[Design; Rule 62-212.400(BACT), F.A.C.]

5. **HRSGs:** The permittee is authorized to install, operate, and maintain four new heat recovery steam generators (HRSGs). Each HRSG shall be designed to recover heat energy from one of the four gas turbines (8A-8D) and deliver steam to the steam turbine electrical generator through a common manifold. ~~Each HRSG shall include an exhaust stack that is 120 feet tall and 19.0 feet in diameter. To minimize the number of cold startups to combined cycle operation, each HRSG system shall include a damper in the ductwork before the stack to reduce heat loss during shutdowns.~~ Each HRSG may be equipped with supplemental gas-fired duct burners having a maximum heat input rate of 495 MMBtu per hour (LHV). *{Permitting Note: The four HRSGs deliver steam to a single steam turbine-electrical generator with a nominal capacity of 470 MW.}* [Application; Design] [Comments: Stack parameters should not be included as a condition of the permit and to FPL’s knowledge has not been included as specific conditions in previous permits. During design, the stack diameter and height may be changed to meet specific needs. The stack parameters provided in the application generally represent worst case dispersion conditions and if any changes occur, FPL would provide additional modeling if requested by the Department. Each HRSG will not be installed with a stack damper, since the Project is being designed as a baseload unit operated within the FPL system. As a result, the unit will be high on the dispatch order due to its efficiency and cycling the unit is not expected to occur. Martin Unit 8, as a baseloaded unit, will not be cycled like smaller independent power units (e.g., 1 on 1 or 2 on 1 configurations) used to meet peak power sales. As a result, the period of cold startups will primarily be associated with maintenance or malfunctions that require rapid cool-down and often downtimes in excess of 48 hours. Stack dampers will not provide any benefit in reducing heat loss from the HRSG for these maintenance and repair periods.]

PERFORMANCE RESTRICTIONS

6. **Permitted Capacity - Gas Turbines:** The heat input rate to each gas turbine is ~~shall not exceed~~ 1600 MMBtu per hour when firing natural gas and 1811 MMBtu per hour when firing distillate oil (based on a compressor inlet air temperature of 59° F, the lower heating value (LHV) of each fuel, and 100% load). Heat input rates will vary depending upon gas turbine characteristics, ambient conditions, alternate methods of operation, and evaporative cooling. The permittee shall provide manufacturer’s performance curves (or equations) that correct for site conditions to the Permitting and Compliance Authorities within 45 days of completing the initial compliance testing. Operating data may be adjusted for the appropriate site conditions in accordance with the performance curves and/or equations on file with the Department. [Rule 62-210.200(PTE), F.A.C.] *{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 100 percent of the test load), to establish appropriate limits and to aid in determining future rule applicability. Regular record keeping, except for 40 CFR Part 75, is not required for heat input. Instead, the owner or operator is expected to determine heat input whenever emission testing is required, to demonstrate at what percentage of rated capacity that the unit is tested..”}* [Comment: The heat input is specific to the conditions noted

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

A. UNIT 8 – “4 ON 1” COMBINED CYCLE GAS TURBINE

and not “normal conditions” in the overall operation of the gas turbine. The permitting note should be added to clarify the use of heat input as permit condition. This is the same permitting note in the recent JEA Brandy Branch PSD Permit.]

7. Permitted Capacity - HRSG Duct Burners: The maximum~~total~~ heat input rate to the duct burners for each HRSG is~~shall not exceed~~ 495 MMBtu per hour based on the lower heating value (LHV) of natural gas. Only natural gas shall be fired in the duct burners. [Rule 62-210.200(PTE), F.A.C.] *{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 100 percent of the test load), to establish appropriate limits and to aid in determining future rule applicability. Regular record keeping, except for 40 CFR Part 75, is not required for heat input. Instead, the owner or operator is expected to determine heat input whenever emission testing is required, to demonstrate at what percentage of rated capacity that the unit is tested..”}*. [Comment: The permitting note should be added to clarify the use of heat input as permit condition.]
8. Methods of Operation: Subject to the restrictions and requirements of this permit, the gas turbines may operate under the following methods of operation.
 - a. *Hours of Operation*: Subject to the operational restrictions of this permit, the gas turbines may operate throughout the year (8760 hours per year). Restrictions on individual methods of operation are specified below.
 - b. *Authorized Fuels*: Each gas turbine shall fire natural gas as the primary fuel, which shall contain no more than 2.0 grains of sulfur per 100 standard cubic feet of natural gas. As a restricted alternate fuel, each gas turbine may fire No. 2 distillate oil (or a superior grade) containing no more than 0.05% sulfur by weight. Each gas turbine shall fire no more than 500 hours of distillate oil during any consecutive 12 months.
 - c. *Simple Cycle Operation*: Each new gas turbine may operate individually in simple cycle mode to produce only direct, shaft-driven electrical power subject to the following operational restrictions.
 - (1) Each gas turbine shall operate in simple cycle mode for no more than 3390 hours during any consecutive 12 months.
 - (2) After demonstrating initial compliance in combined cycle mode, the combined group of four gas turbines shall operate in simple cycle mode for no more than an average of 1000 hours during any consecutive 12 months.
 - d. *Combined Cycle Operation*: Each gas turbine/HRSG system may operate to produce direct, shaft-driven electrical power and deliver steam to the steam turbine-electrical generator to produce steam-generated electrical power as a four-on-one combined cycle unit subject to the restrictions of this permit. In accordance with the manufacturer’s specifications, the SCR system shall be on line and functioning properly during combined cycle operation: with the exception of startups, shutdowns or malfunctions as provided for in Specific Condition 16 or DLN tuning as provided for in Specific Condition 18. *{Permitting Note: Combined cycle as termed in this permit means the production of steam in the HRSG.}* [Comment: Inclusion of allowable excess emissions clarifies the intent of this condition. Also, if there is a steam turbine malfunction, steam could still be produced in the HRSG and diverted to the condenser. As an alternative, a specific condition similar to the Martin draft permit could be added.]
 - e. *Inlet Fogging*: In accordance with the manufacturer’s recommendations and appropriate ambient conditions, the evaporative cooling system may be operated to reduce the compressor inlet air

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temperature and provide additional direct, shaft-driven electrical power. This method of operation is commonly referred to as “fogging” and may be used in either simple cycle or combined cycle modes.

- f. *Peaking*: When firing natural gas, each gas turbine may operate in a high-temperature peaking mode to generate additional direct, shaft-driven electrical power to respond to peak demands. During any consecutive 12 months, each gas turbine shall operate while in the peaking mode for no more than 60 hours of simple cycle operation and no more than 400 hours of combined cycle operation.
- g. *Power Augmentation*: When firing natural gas in either simple cycle or combined cycle modes, steam may be injected into each gas turbine to generate additional direct, shaft-driven electrical power to respond to peak demands. To qualify as “power augmentation”, the combustion turbine must operate at a load of 95% or greater than that of the manufacturer’s maximum base load rate adjusted for the compressor inlet air conditions. Prior to activating and after deactivating the power augmentation mode, the operator shall log the date, time, and new mode of operation. Each gas turbine shall operate in the power augmentation mode for no more than 400 hours during any consecutive 12 months. The gas turbines shall not operate simultaneously in peaking and power augmentation modes. In addition, total combined operation of power augmentation and peaking modes shall not exceed 400 hours during any consecutive 12 months per unit.
- h. *Combined Cycle Operation with Duct Firing*: When firing natural gas and operating in combined cycle mode, each gas turbine/HRSG system may fire natural gas in the duct burners to provide additional steam-generated electrical power. The heat input to the duct burners for all four ~~Each~~ HRSGs shall not exceed 5,702,400 MMBtu ~~fire the duct burners no more than 2,880 hours~~ during any consecutive 12 months. . [Comment: The PSD permit application requested an equivalent heat input limit for duct firing based on the maximum heat input 495 MMBtu/hr for 2,880 hours per year. Duct firing will be variable depending on power needs and limiting hours would not provide the flexibility required to provide incremental power from Unit 8. Moreover, providing incremental power through duct firing on Unit 3 would reduce requirements of operating other units in FPL’s system with concomitant benefits in reducing emissions from older less efficient and higher emitting units.]

[Application; Rules 62-210.200(PTE) and 62-212.400(BACT), F.A.C.]

EMISSIONS STANDARDS

9. Emissions Standards: Emissions from each gas turbine shall not exceed the following standards.

Pollutant	Fuel	Method of Operation	Initial ¹		CEMS (Block Average)
			ppmvd @ 15% O ₂	lb/hour ²	ppmvd @ 15% O ₂
CO ^a	Oil	Simple or Combined Cycle	14.4, 3-hr	64.7	15.0, 24-hr
		Gas	7.4, 3-hr	27.5	8.0, 24-hr
	Combined Cycle w/DB, PA or PK	14.17-4, 3-hr	71.537-5	108.0, 24-hr	
	Simple or Combined Cycle w/PA	12.0, 3-hr	45.0	12.0, 24-hr	
	Combined Cycle w/DB+PA	12.0, 3-hr	55.6	12.0, 24-hr	
NOx ^b	Oil	Simple Cycle	42.0, 3-hr	319.2	42.0, 3-hr
		Combined Cycle – SCR	120.0, 3-hr	91.276-0	120.0, 24-hr
	Gas	Simple Cycle	9.0, 3-hr	58.7	9.0, 24-hr
		Simple Cycle w/PA	NA	(76.2)	12.0, 34-hr

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		Simple Cycle w/Peaking	NA	(95.340+ 3)	15.0, 34-hr
		Combined Cycle – SCR	2.5, 3-hr	16.3	2.5, 24-hr
		Combined Cycle w/DB – SCR	2.5, 3-hr	23.22+ 1	2.5, 24-hr
PM/PM10 ^c	Oil/Gas	Simple or Combined Cycle	Fuel Specifications		
		Simple or Combined Cycle	Visible emissions shall not exceed 10% opacity for each 6-minute average as determined by EPA Method 9 observations.		
SAM/SO2 ^d	Oil/Gas	Simple or Combined Cycle	Fuel Specifications		
VOC ^e	Oil	Simple or Combined Cycle	2.5, 3-hr	6.0	NA
	Gas	Simple or Combined Cycle	1.3, 3-hr	2.8	NA
		Combined Cycle, w/DB or PA	4.0, 3-hr	10.59+ 2	NA
Ammonia ^f	Oil/Gas	Combined Cycle – SCR	95.0, 3-hr	NA	NA

¹ Initial compliance tests are not required for Units 8A and 8B in simple cycle mode.

² Applicable for the initial compliance tests only; lb/hr values are at a turbine inlet of 59 degrees F and must be adjusted to actual testing conditions.

Note: “DB” means duct burning. “PA” means power augmentation.

[Comments: The heading “Block” should be added to clarify the averaging period. As discussed at the August 8, 2002 meeting, the column for lb/hr is applicable for initial testing only. A footnote was added to indicate the lb/hr values were included for initial testing only and that these are at compressor inlet temperature of 59 degrees F and must be adjusted. The lb/hr values for some conditions were corrected to the ISO condition. For the 24-hour block for CO, a limit of 10 ppmvd corrected to 15% O₂ for all combined cycle operating modes is proposed. This is a slight increase in the Department’s proposed limit of 8 ppmvd corrected to 15% O₂ but lower for PA and PK modes. The 14.1 ppmvd corrected to 15% O₂ reflects the maximum CO emissions with duct firing at 495 MMBtu/hr (LHV). An averaging period of 1-hour for NO_x emissions in PA or PK modes is inappropriate and as a minimum difficult if not impossible to track through using a CEM system. A 3-hour averaging time is appropriate and consistent with the Department’s testing requirements. The requirement for a NO_x emission limit of 10 ppmvd will require considerable increased costs for the SCR system by the addition of catalyst. Fuel oil will be only used on a limited basis and such increased cost will have little environmental benefit. For VOCs, the 10.5 lb/hr is equivalent to 4 ppmvd corrected to 15% O₂ reflects the maximum CO with duct firing at 495 MMBtu/hr (LHV). An emission limit for ammonia slip of 9 ppmvd corrected to 15 percent oxygen is requested. The lower limit would unnecessarily require additional catalyst that is equivalent to that required for reducing NO_x emissions from 3.5 ppmvd corrected to 2.5 ppmvd corrected.]

- a. Compliance with the initial 3-hour CO standards ~~cannot~~ be demonstrated based on data collected by the required CEMS. Compliance may also be determined by EPA Method 10. Compliance with the 24-hour block CO standards shall be determined separately for simple cycle and combined cycle ~~each method~~ ~~method~~ of operation based on the hours of operation for each method. *{Permitting Note: A 24-hour compliance average may be based on as little as 1-hour of CEMS data or as much as 24-hours of CEMS data.}* [Comment: Language added to clarify condition.]

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- b. Compliance with the initial 3-hour NO_x standards ~~shall~~ be demonstrated based on data collected by the required CEMS. Compliance may also be determined by EPA Method 7E or 20. NO_x mass emission rates are defined as oxides of nitrogen expressed as NO₂. Compliance with the 24-hour block NO_x standard shall be demonstrated based on data collected by the required CEMS. Compliance with the NO_x standard for simple cycle operation with peaking or power augmentation shall be demonstrated on a 3-hour-to-hour block average basis with CEMS data. CEMS data collected during simple cycle peaking or power augmentation shall be excluded from the data used to demonstrate compliance with the 24-hour standard for normal operation. *{Permitting Note: The “lb/hour” rates for simple cycle peaking or power augmentation are for informational purposes only.}* [Comment: Language added to clarify condition.]
- c. The fuel specifications established in Condition No. 88 of this section combined with the efficient combustion design and operation of each gas turbine represents the Best Available Control Technology (BACT) determination for PM/PM₁₀ emissions. Compliance with the fuel specifications, CO standards, and visible emissions standards shall serve as indicators of good combustion. *{Permitting Note: PM₁₀ emissions for gas firing are estimated at 9 lb/hour for simple cycle operation, 11 lb/hour for combined cycle operation, and 17 lb/hour for combined cycle operation with duct burning. PM₁₀ emissions for oil firing are estimated at 17 lb/hour for simple cycle operation and 37 lb/hour for combined cycle operation.}*
- d. The fuel sulfur specifications in Condition No. 88 of this section effectively limit the potential emissions of SAM and SO₂ from the gas turbines and represent the Best Available Control Technology (BACT) determination for these pollutants. Compliance with the fuel sulfur specifications shall be determined by the requirements in Condition No. 2828 of this section. *{Permitting Note: SO₂ emissions for gas firing are estimated at 9.8 lb/hour for simple and combined cycle operation and 12.8 lb/hour for combined cycle operation with duct burning. SO₂ emissions for oil firing are estimated at 99 lb/hour for simple and combined cycle operation. SAM emissions are estimated to be less than 10% of the SO₂ emissions.}*
- e. Compliance with the VOC standards shall be demonstrated by conducting tests in accordance with EPA Method 25A. Optionally, EPA Method 18 may be also be performed to deduct emissions of methane and ethane. The emission standards are based on VOC measured as methane.
- f. Not Federally Enforceable. Compliance with the ammonia slip standard shall be demonstrated by conducting tests in accordance with EPA Method CTC-027.
- g. Initial compliance tests are not required for Units 8A and 8B in simple cycle mode.

[Rule 62-212.400(BACT), F.A.C.]

10. Combined Cycle Operation With-Dump Condenser: If the steam-electrical turbine generator is off line, the permittee is authorized to operate the gas turbine/HRSG systems by transferring steam to a dump condenser. Operation with a-dump condenser must still meet the standards established for combined cycle operation with ammonia injection. ~~*{Permitting Note: Although this method of operation is inefficient, it may be preferable due to the time necessary to shutdown, cool, and prepare the units for simple cycle operation.}*~~ [Application] [Comment: The condenser for the steam turbine will have the ability to dump steam. A separate condenser dump condenser would not be required. Permitting note should be deleted as it is inappropriate and implies that the Department has authority in approving the efficiency of Projects.]
11. Duct Burners: The duct burners are also subject to the provisions of Subpart Da of the New Source Performance Standards in 40 CFR 60, which are summarized in Appendix Da. [Subpart Da, 40 CFR 60] *{Permitting Note: Compliance with the combined cycle emission limit of 2.5 ppmvd corrected to 15*

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percent oxygen is more stringent than the NSPS limit of 1.6 lb/MW-hr. The use of natural gas with a sulfur content of 2 grains/100 scf will produce emission rates more stringent than the NSPS limits of 0.03 lb/MMBtu and 0.2 lb/MMBtu for PM and SO₂, respectively. Demonstrating compliance with the NO_x emission limit for combined cycle operation will demonstrate compliance with the NSPS emission limit. [Comment: The added permitting note would clarify that meeting the BACT limit would meet the NSPS limit for Subpart Da.]

PROJECT PHASE-IN

12. Existing Simple Cycle Units: For existing Units 8A and 8B (EU 011 and 012), PSD-FL-286 shall remain in full force and effect. †This PSD permit shall not apply until initial steam blows. Upon commencement of the initial steam blows for Units 8A and 8B, this permit shall replace and supersede previously issued PSD permit (No. PSD-FL-286) for these tow units. ~~upon commencement of the initial steam blows.~~ PSD Permit No. PSD-FL-286 will continue to be in effect for the existing gas heaters and oil tank. [Rule 62-4.070(3), F.A.C.]

EXCESS EMISSIONS

13. Operating Procedures: The Best Available Control Technology (BACT) determinations established by this permit rely on “good operating practices” to reduce emissions. Therefore, all operators and supervisors shall be properly trained to operate and maintain the gas turbines, HRSGs, and pollution control systems in accordance with the guidelines and procedures established by each manufacturer. The training shall include good operating practices as well as methods of minimizing excess emissions. [Rules 62-4.070(3) and 62-212.400(BACT), F.A.C.]
14. Excess Emissions Prohibited: Excess emissions caused 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. ~~All such preventable emissions shall be included in any compliance determinations based on CEMS data.~~ [Rule 62-210.700(4), F.A.C.] [Comment: The last sentence should be deleted since there is no criteria for making such determinations. Moreover, the Rule cited does not include the additional requirement of excluding the data from CEMs measurement.]
15. Alternate Visible Emissions Standard: Visible emissions due to startups, shutdowns, and malfunctions shall not exceed 10% opacity except for up to ten, 6-minute averaging periods during a calendar day, which shall not exceed 20% opacity. [Rule 62-212.400(BACT), F.A.C.]
16. Excess Emissions Allowed: As specified in this condition, excess emissions resulting from startup, shutdown, fuel switches and ~~documented~~ malfunctions are allowed provided ~~that operators employ the best operational practices to minimize emissions are adhered to~~ the amount and duration of excess emissions during such incidents are minimized. For each gas turbine/HRSG system, excess emissions resulting from startup, shutdown, fuel switches or ~~documented~~ malfunctions occurrences shall in no case exceed two hours (120 minutes) in any 24-hour period except for the following specific cases: unless authorized by the Department for longer periods. [Comment: The suggested wording is more consistent with Department’s rule. In addition, the term “documented” has no associated criteria from which any meaningful determination can be made.]
 - a. For warm startup of the steam turbine ~~to~~ during combined cycle operation, up to three hours of excess emissions are allowed. “Warm startup” is defined as a startup of the steam turbine ~~to combined cycle operation~~ following a shutdown lasting at least 24 hours.
 - b. For cold startup of the steam turbine ~~to~~ during combined cycle operation, up to four hours of excess emissions are allowed. “Cold startup” is defined as a startup of the steam turbine ~~to combined cycle~~

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- ~~operation~~ following a shutdown lasting at least 48 hours.
- c. For shutdown from combined cycle operation, up to three hours of excess emissions are allowed.
 - d. For *cold startup* of the heat recovery steam generator (HRSG) during combined cycle operation, excess emissions shall not exceed 240 minutes hours for any combustion turbine/HRSG train. “*Cold startup*” of the HRSG is defined as when the High Pressure (HP) steam drum is below 450 pounds per square inch (gage) for at least a one-hour period.

For days with simple cycle operation, excess emissions shall not exceed three hours in any 24-hour period due to all combined occurrences of startups, shutdowns, and malfunctions. For days with combined cycle operation, excess emissions shall not exceed ~~12~~^{four} hours in any 24-hour period due to all combined occurrences of startups, shutdowns, and malfunctions. For startup to combined cycle operation, ammonia injection shall begin as soon as operation of the gas turbine/HRSG system achieves the operating parameters specified by the manufacturer. As authorized by Rule 62-210.700(5), F.A.C., the above conditions allow excess emissions only for specifically defined periods of startup, shutdown, and documented malfunction of the gas turbines. Fuel switching is considered to be a startup/shutdown procedure allowing for excess emissions. [Design; Rules 62-212.400(BACT) and 62-210.700, F.A.C.] [Comment: FPL requests a condition similar to that approved for the Sanford and Fort Myers Repowering Projects. The steam turbine for Martin Unit 8 is larger than that associated with these Projects and the sequencing of the initial CT/HRSG trains may take more than 4 hours to reach compliance with emission limits. A permitting note was added to allow for fuel switching.]

17. **Initial Steam Blows:** Prior to completing the conversion from simple cycle to combined cycle operation, the permittee is authorized to operate each gas turbine at loads below 50% for the purpose of cleaning the HRSG piping system and piping connecting the HRSG to the steam turbine. Prior to conducting any steam blows, the permittee shall submit a proposed schedule. On the first day of conducting steam blows, the permittee shall notify the Compliance Authority that the process has begun. The permittee shall complete this process within a reasonable time ~~90 days~~ of conducting the initial steam blow. During the steam blows, the following conditions apply:
- a. The permittee shall take all precautions to minimize the extent and duration of excess emissions.
 - b. Each gas turbine shall fire only natural gas and each CEMS shall be on line and functioning ~~properly~~.
 - c. CO and NOx emissions may exceed the BACT limits specified in this permit; however, NOx emissions shall not exceed the NSPS Subpart GG limit of 110 ppmvd corrected to 15% oxygen based on a 24-hour block average. If the NSPS standard is exceeded, the permittee shall notify the Compliance Authority within one working day ~~24 hours~~ of the incident.

Within 30 days of completing the initial steam blows, the permittee shall submit a report to the Bureau of Air Regulation and the Compliance Authority summarizing the daily emissions resulting from each steam blow. This permit condition is only applicable if the simple cycle operation begins prior to combined cycle operation and compliance tests for simple cycle have not been performed. *{Permitting Note: It is estimated that steam blows will occur intermittently over a 30-day period for each gas turbine/HRSG system followed by a similar 60-day period of intermittent steam blows for the common piping system serving the four interconnected combined cycle units. It is not expected that steam blows would occur every day during these periods.}* [Application] [Comment: As described in the additional information supplied to the Department, the exact calendar period for steam blows cannot be determined. Steam blows are a necessary part of construction and should be limited to a specific duration. If simple cycle operation does not initially occur as part of the Project, the CEMs will not be operational and the required testing to assure the required accuracy and precision (i.e. RATA testing) will not have been performed.]

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- 18. DLN Tuning: CEMS data collected during initial or other major DLN tuning sessions shall be excluded from the CEMS compliance demonstration provided the tuning session is performed in accordance with the manufacturer’s specifications. A “major tuning session” would occur after completion of initial construction, a combustor change-out, a major repair or maintenance to a combustor, or other similar circumstances. Prior to performing any major tuning session, the permittee shall provide the Compliance Authority with an advance notice that details the activity and proposed tuning schedule. The notice may be by telephone, facsimile transmittal, or electronic mail. [Design; Rule 62-4.070(3), F.A.C.]

EMISSIONS PERFORMANCE TESTING

- 19. Test Methods: Any required tests shall be performed in accordance with the following reference methods.

Table with 2 columns: Method, Description of Method and Comments. Rows include CTM-027, 5, 7E, 9, 10, 18, 20, and 25A.

Method CTM-027 is published on EPA’s Technology Transfer Network Web Site at “http://www.epa.gov/ttn/emc/ctm.html”. The other methods are described in Appendix A of 40 CFR 60, adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Department. [Rules 62-204.800, F.A.C.; 40 CFR 60, Appendix A]

- 20. Initial Compliance Determinations: Each new gas turbine shall be stack tested to demonstrate initial compliance with the emission standards for CO, NOx, VOC, visible emissions, and ammonia slip. The tests shall be conducted within 60 days after achieving at least 90% of the maximum permitted capacity for each unit configuration (i.e., simple cycle and combined cycle operation), but not later than 180 days after the initial startup of each unit configuration. Each unit shall be tested when firing natural gas and distillate oil. CEMS data collected during the required Relative Accuracy Test Assessments (RATA) may be used to demonstrate compliance with the initial 3-hour CO and NOx standards. With appropriate flow measurements and calculations, CEMS data may also be used to demonstrate compliance with the CO and NOx mass emissions standards. CO and NOx emissions recorded by the CEMS shall also be reported for each run during tests for visible emissions, VOC and ammonia slip. The Department may require the permittee to conduct initial tests after the replacement or repair of any air pollution control equipment, such as the SCR catalyst, DLN combustors, etc. [Rule 62-297.310(7)(a)1., F.A.C.] [Comment: Deleting the phrase “at least 90% of the” would make the wording consistent with the NSPS requirements in Section 60.8 and the Department’s previous permits. There will be no exhaust flow monitors required for the Project and the mass emissions can be determined using fuel measurements and “F”-Factors. The sentence

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related to additional testing should be deleted since the department has this authority if non-compliance is suspected. Moreover, there will be CEMs for NO_x and CO, which provide compliance data.]

21. **Continuous Compliance:** The permittee shall demonstrate continuous compliance with the CO and NO_x emissions standards based on data collected by the certified CEMS. Within 45 days of conducting any Relative Accuracy Test Assessments (RATA) on a CEMS, the permittee shall submit a report to the Compliance Authority summarizing results of the RATA. Compliance with the CO emission standards also serves as an indicator of efficient fuel combustion, which reduces emissions of particulate matter and volatile organic compounds. [Rule 62-212.400 (BACT), F.A.C.]
22. **Annual Compliance Tests:** During each federal fiscal year (October 1st to September 30th), each gas turbine shall be tested to demonstrate compliance with the emission standards for visible emissions and ammonia slip. NO_x emissions recorded by the CEMS shall be reported for each ammonia slip test run. CO emissions recorded by the CEMS shall be reported for the visible emissions observation period. *{Permitting Note: After initial compliance with the VOC standards is demonstrated, annual compliance tests for VOC emissions are not required. Compliance with the continuously monitored CO standards shall indicate efficient combustion and low VOC emissions.}* [Rules 62-212.400 (BACT) and 62-297.310(7)(a)4., F.A.C.]

CONTINUOUS MONITORING REQUIREMENTS

23. **CEM Systems:** The permittee shall install, calibrate, maintain, and operate continuous emission monitoring systems (CEMS) to measure and record the emissions of CO and NO_x from the combined cycle gas turbine in a manner sufficient to demonstrate continuous compliance with the CEMS emission standards of this section. Each monitoring system shall be installed and certified according to 40 CFR Part 75, ~~calibrated, and properly functioning prior to the initial performance tests and commencement of commercial operation.~~ Within one working day of discovering emissions in excess of a CO or NO_x standard set forth in Condition 9 (and subject to the specified averaging period), the permittee shall contact the Compliance Authority. [Comment: 40 CFR 75.4 states the CEMS shall be certified the earlier of 90 unit operating days or 180 calendar days after commercial operation. This criteria should be used as it will not be definitively known if the CEMS are ‘properly functioning’ until all certification tests have been successfully completed. Also, the 90 unit operating day period allows sufficient time for debugging of the unit and the CEMS before data is reported for the Acid Rain Program.]
 - a. **CO Monitors.** The CO monitor shall be certified pursuant to 40 CFR 60, Appendix B, Performance Specification 4 or 4A. Quality assurance procedures shall conform to the requirements of 40 CFR 60, Appendix F, and the Data Assessment Report of Section 7 shall be made each calendar quarter, and reported semiannually to the Compliance Authority. The RATA tests required for the CO monitor shall be performed using EPA Method 10 in Appendix A of 40 CFR 60 and shall be based on a continuous sampling train. The CO monitor span values ~~shall have multi-span capability with~~ be set appropriately ~~spans established~~ for the methods of operation (simple cycle gas firing, combined cycle gas firing, simple cycle oil firing, combined cycle oil firing, etc.). ~~{Permitting Note: The alternate standards for steam blows will require even higher span values.}~~ [Comment: PS 4A will likely be more appropriate than PS 4 due to expected CO emissions levels. A single range CO monitor may be able to record emissions consistent with the limits set in Specific Condition 10. See comments to Specific Condition 17.]
 - b. **NO_x Monitors.** Each NO_x monitor shall be certified, operated and maintained pursuant to the applicable requirements of 40 CFR Part 75. ~~and shall be operated and maintained in accordance with the applicable requirements of 40 CFR Part 75, Subparts B and C.~~ Record keeping and reporting shall be conducted pursuant to 40 CFR Part 75, Subparts F and G. The RATA tests required for the NO_x

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monitor span value(s) shall be set according to 40 CFR Part 75, Appendix A ~~performed using EPA Method 20 or 7E in Appendix A of 40 CFR 60. The NO_x monitor shall have multi-span capability with appropriate spans established for the methods of operation (simple cycle gas firing, combined cycle gas firing, simple cycle oil firing, combined cycle oil firing, etc.).~~ {Permitting Note: The alternate standards for steam blows will require even higher span values.} [Comment: A single range NO_x monitor may be able to record emissions consistent with the emissions limits set in Specific Condition 10. See comments to Specific Condition 17.]

- c. *O₂ or CO₂ Monitors.* The oxygen (O₂) content or carbon dioxide (CO₂) content of the flue gas shall also be monitored at the location where CO and/or NO_x are monitored to correct the measured emissions rates to 15% oxygen. If a CO₂ monitor is installed, the oxygen content of the flue gas shall be calculated by the CEMS using F-factors that are appropriate for the fuel fired. Each monitor shall be certified, operated and maintained pursuant to 40 CFR 75 as the “diluent” monitor of the “NO_x-diluent” system. ~~60, Appendix B, Performance Specification 3. Quality assurance procedures shall conform to the requirements of 40 CFR 60, Appendix F, and the Data Assessment Report of Section 7 shall be made each calendar quarter, and reported semiannually to the Compliance Authority. The RATA tests required for the O₂ or CO₂ monitors shall be performed using EPA Method 3B, of Appendix A of 40 CFR 60.~~ [Comment: the O₂ or CO₂ monitor installed is known as the ‘diluent’ monitor included in the ‘NO_x-diluent’ monitoring system under 40 CFR 75. For consistency the NO_x and O₂/CO₂ monitors should be subject to the same regulatory routines, i.e. Part 75. Under Part 75, no separate RATA is required for the diluent monitor as the RATA results are reported for the NO_x-diluent system (rather than for the individual NO_x and O₂/CO₂ analyzers) in units of lb/MMBtu.]
- d. *1-Hour Block Averages.* Hourly average values shall begin at the top of each hour. Each hourly average value shall be computed using at least one data point in each fifteen-minute quadrant of an hour, where the unit combusted fuel during that quadrant of an hour. Notwithstanding this requirement, an hourly value shall be computed from at least two data points separated by a minimum of 15 minutes (where the unit operates for more than one quadrant of an hour). If less than two such data points are available, the hourly average value is not valid. The permittee shall use all valid measurements or data points collected during an hour to calculate the hourly average values. . For purposes of determining compliance with the CEMS standards, missing (or excluded) data shall not be included in the 1-hour block averages. The CEMS shall be designed and operated to sample, analyze, and record data evenly spaced over an hour. If the CEMS measures concentration on a wet basis, the CEM system shall include provisions to determine the moisture content of the exhaust gas and an algorithm to enable correction of the monitoring results to a dry basis (0% moisture). Alternatively, the owner or operator may develop through manual stack test measurements a curve of moisture contents in the exhaust gas versus load for each allowable fuel, and use these typical values in an algorithm to enable correction of the monitoring results to a dry basis (0% moisture). Final results of the CEMS shall be expressed as ppmvd corrected to 15% oxygen. The CEMS shall be used to demonstrate compliance with the CEMS emission standards for CO and NO_x as specified in this permit. Upon request by the Department, the CEMS emission rates shall be corrected to ISO conditions to demonstrate compliance with the applicable standards of 40 CFR 60.332. [Comment: missing or substituted data should not be included for compliance as is stated in (e) below.]
- e. *3-hour Block Averages:* For oil firing during simple cycle operation, the 3-hour block average shall be calculated from three consecutive hourly average emission rate values. For purposes of determining compliance with the CEMS emission standards of this permit, missing (or excluded) data shall not be substituted. Instead, the 3-hour block average shall be determined using the remaining hourly data in the 3-hour block. [Rule 62-212.400(BACT), F.A.C.]

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- f. *24-hour Block Averages:* A 24-hour block shall begin at midnight of each operating day and shall be calculated from 24 consecutive hourly average emission rate values. If a unit operates less than 24 hours during the block, the 24-hour block average shall be the average of available valid hourly average emission rate values for the 24-hour block. For purposes of determining compliance with the 24-hour CEMS standards, missing (or excluded) data shall not be substituted. Instead, the 24-hour block average shall be determined using the remaining hourly data in the 24-hour block. {Permitting Note: There may be more than one 24-hour compliance demonstration for CO and NO_x emissions depending on the use of alternate methods of operation. [Rule 62-212.400(BACT), F.A.C.]
- g. *Data Exclusion.* Each CEMS shall monitor and record emissions during all operations including all episodes of startup, shutdown, ~~and~~ malfunction, fuel switches, DLN Tuning and steam blows. CEMS emissions data recorded during such episodes may be excluded from the corresponding CEMS compliance demonstration subject to the provisions of Condition Nos. 1646, 17 and 18 of this section. ~~All periods of data excluded shall be consecutive for each such episode. The permittee shall minimize the duration of data excluded for such episodes to the extent practicable. Data recorded during such episodes shall not be excluded if the episode was caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure, which may reasonably be prevented. Best operational practices shall be used to minimize hourly emissions that occur during such episodes. Emissions of any quantity or duration that occur entirely or in part from poor maintenance, poor operation, or any other equipment or process failure, which may reasonably be prevented, shall be prohibited.~~ [Comment: The remaining language in the paragraph is redundant to previous conditions.]
- h. *Availability.* Monitor availability for the CEMS shall meet the performance specification of 40 CFR Part 75 ~~be 95% or greater in any calendar quarter.~~ The quarterly permit excess emissions report shall be used to provide information ~~demonstrate~~ monitor availability. In the event monitor ~~95%~~ availability required by 40 CFR Part 75 is not achieved, the permittee shall provide the Department with a report identifying the problems in achieving monitor ~~95%~~ availability and a plan of corrective actions that will be taken to achieve monitor ~~95%~~ availability. The permittee shall implement the reported corrective actions within the next calendar quarter. ~~Failure to take corrective actions or continued failure to achieve the minimum monitor availability shall be violations of this permit.~~ [Comment: Any requirements for monitor availability should be consistent with 40 CFR Part 75.]

~~{Permitting Note: Compliance with these requirements ensure compliance with the other applicable CEM system requirements such as: NSPS Subparts Da and GG; Rule 62-297.520, F.A.C.; 40 CFR 60.7(a)(5) and 40 CFR 60.13; 40 CFR Part 51, Appendix P; 40 CFR 60, Appendix B - Performance Specifications; and 40 CFR 60, Appendix F - Quality Assurance Procedures.} [Rules 62-4.070(3) and 62-212.400(BACT), F.A.C.] {Comment: The permitting note should be a permit condition, since compliance with Subparts GG and Da are important.}~~

24. *Water Injection Monitoring Requirements:* In accordance with the manufacturer's specifications, the permittee shall install, calibrate, operate and maintain a monitoring system to continuously measure and record the water-to-fuel ratio when firing distillate oil. The permittee shall document the water-to-fuel ratio required to meet permitted emissions levels over the range of load conditions allowed by this permit. During NO_x monitor downtimes or malfunctions, the permittee shall operate at the water-to-fuel ratio that is consistent with the documented flow rate for the gas turbine load condition. ~~{Permitting Note: The water to fuel ratio at maximum load to achieve the NO_x standards during simple cycle oil firing is approximately 1.10 or a water injection rate of approximately 101,000 pounds per hour.}~~ [Rules 62-4.070(3) and 62-212.400(BACT), F.A.C.] [Comment: The water injection rate will vary based on the GE control system.]

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

A. UNIT 8 – “4 ON 1” COMBINED CYCLE GAS TURBINE

25. Ammonia Monitoring Requirements: In accordance with the manufacturer’s specifications, the permittee shall install, calibrate, operate and maintain an ammonia flow meter to measure and record the ammonia injection rate to the SCR system. The permittee shall document the general range of ammonia flow rates required to meet permitted emissions levels over the range of load conditions allowed by this permit by comparing NOx emissions recorded by the CEM system with ammonia flow rates recorded using the ammonia flow meter. During NOx monitor downtimes or malfunctions, the permittee shall operate at the ammonia flow rate that is consistent with the documented flow rate for the combustion turbine load condition. [Rules 62-4.070(3) and 62-212.400(BACT), F.A.C.]

RECORDS AND REPORTS

26. Monitoring of Capacity: ~~To demonstrate compliance with the permitted capacities,~~ The permittee shall monitor and record the operating rate of each combined cycle gas turbine/HRSG duct burner system on a daily average basis, considering the number of hours of operation during each day (including the times of startup, shutdown and malfunction). Such monitoring shall be made using a monitoring component of the CEM system required above, or by monitoring daily rates of consumption and heat content of each allowable fuel in accordance with the provisions of 40 CFR 75 Appendix D. [Rules 62-4.070(3) and 62-212.400(BACT), F.A.C.] [Comment: See comments to Specific Conditions 7 and 8.]
27. Monthly Operations Summary: By the fifth calendar day of each month, the permittee shall record the following for each fuel in a written or electronic log for each gas turbine for the previous month of operation: fuel consumption, hours of operation, hours of power augmentation, hours of peaking, hours of duct firing, and the updated 12-month rolling totals for each. Information recorded and stored as an electronic file shall be available for inspection and printing within at least three days of a request by the Department. The fuel consumption shall be monitored in accordance with the provisions of 40 CFR 75 Appendix D. [Rules 62-4.070(3) and 62-212.400(BACT), F.A.C.]
28. Fuel Sulfur Records: The permittee shall demonstrate compliance with the fuel sulfur limits specified in this permit by maintaining the following records of the sulfur contents.
- Compliance with the fuel sulfur limit for natural gas shall be demonstrated by keeping reports obtained from the vendor indicating the average sulfur content of the natural gas pursuant to 40 CFR Part 75 ~~being supplied from the pipeline for each month of operation~~. Methods for determining the sulfur content of the natural gas shall be ASTM methods D4084-82, D3246-81 or more recent versions.
 - Compliance with the distillate oil sulfur limit shall be demonstrated by taking a sample, analyzing the sample for fuel sulfur, and reporting the results to each Compliance Authority before initial startup. Sampling the fuel oil sulfur content shall be conducted in accordance with ASTM D4057-88, Standard Practice for Manual Sampling of Petroleum and Petroleum Products, and one of the following test methods for sulfur in petroleum products: ASTM D129-91, ASTM D1552-90, ASTM D2622-94, or ASTM D4294-90. More recent versions of these methods may be used. For each subsequent fuel delivery, the permittee shall maintain a permanent file of the certified fuel sulfur analysis from the fuel vendor. At the request of a Compliance Authority, the permittee shall perform additional sampling and analysis for the fuel sulfur content.

The above methods shall be used to determine the fuel sulfur content in conjunction with the provisions of 40 CFR 75 Appendix D. [Rules 62-4.070(3) and 62-4.160(15), F.A.C.]

29. Excess Emissions Notification: If a CEMS reports emissions in excess of an emissions standard listed in Condition 9 (and subject to the specified averaging periods ~~or the permittee observes visible emissions in excess of a standard~~, the permittee shall notify the Compliance Authority within one working day of occurrence. Allowable excess emissions for startups, shutdowns, fuel switches, malfunctions, steam blows

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

A. UNIT 8 – “4 ON 1” COMBINED CYCLE GAS TURBINE

and DLN tuning, as described in Specific Condition 16, 17 and 18 are excluded from determining compliance. The notification shall include a preliminary report of: the nature, extent, and duration of the emissions; the probable cause of the emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. [Rule 62-210.700, F.A.C.] [Comment: The VE standard requires a trained observer and such reporting is not possible. Moreover, Manatee Unit 3 will exclusively use natural gas and such reporting is unnecessary. Notification of allowable excess emission should be excluded from the notification. Such allowable excess emissions are reported in the quarterly report.]

30. Semiannual NSPS Excess Emissions Report: In accordance with 40 CFR 60.7(d), the permittee shall submit a report to the Compliance Authority summarizing any emissions in excess of the NSPS standards within 30 days following the end of each calendar quarter. For purposes of reporting emissions in excess of NSPS Subpart GG, excess emissions from the gas turbine are defined as: any CEMS hourly average value exceeding the NSPS NO_x emission standard identified in Appendix GG; and any daily period during which the sulfur content of the fuel being fired in the gas turbine exceeds the NSPS standard identified in Appendix GG. For purposes of reporting emissions in excess of NSPS Subpart Da, excess emissions from duct firing are defined as: NO_x or PM emissions in excess of the NSPS standards except during periods of startup, shutdown, or malfunction; and SO₂ emissions in excess of the NSPS standards except during startup or shutdown. [40 CFR 60.7]
31. Quarterly Permit Excess Emission Report: Within 30 days following the end of each quarter, the permittee shall submit a report to the Compliance Authority summarizing periods of excess CO and NO_x emissions. Such information shall also be summarized for simple/combined cycle startups, simple/combined cycle shutdowns, malfunctions, and major tuning sessions. In addition, the report shall summarize the CEMS systems monitor availability for the previous quarter. [Rules 62-4.130, 62-204.800, 62-210.700(6), F.A.C.; and 40 CFR 60.7]

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

B. GAS-FIRED FUEL HEATERS

This section of the permit addresses the following emissions units.

ID	Emission Unit Description
013	Four gas-fired fuel heaters, 22 MMBtu/hour each

APPLICABLE REQUIREMENTS

1. ~~NSPS Requirements: The gas-fired fuel heaters are subject to the New Source Performance Standards for Small Industrial Commercial Institutional Steam Generating Units specified in Subpart Dc of 40 CFR 60. The units are subject to the record keeping and reporting requirements of this regulation, which are summarized in Appendix Dc of this permit. [Rule 62-204.800(7), F.A.C.; 40 CFR 60, Subpart Dc]~~[Comment: Subpart Dc does not apply to direct fired gas heaters.]

EQUIPMENT

2. Gas-Fired Fuel Heaters: The permittee is authorized to install two new 22 MMBtu per hour (LHV) fuel heaters. *{Permitting Note: The two new units will be added to two existing units under EU 013. The gas-fired fuel heaters heat the natural gas prior to firing in the "hot nozzle" dry low NOx combustors to increase cycle efficiency. The fuel heaters operate continuously during simple cycle operation and for startup to combined cycle operation. Once combined cycle operation is established, the fuel heaters are shut down and a small heat exchanger in the HRSG exhaust is used to preheat the natural gas prior to combustion in the gas turbines.}* [Application; Design]

PERFORMANCE REQUIREMENTS

3. Permitted Capacity: Based on the lower heating value (LHV) of natural gas, each gas-fired fuel heater shall not exceed 22 MMBtu per hour. [Application; Rule 62-210.200(PTE), F.A.C.]
4. Authorized Fuel: Each fuel heater shall fire only natural gas, which shall contain no more than 2.0 grains of sulfur per 100 standard cubic feet of natural gas. [Rules 62-212.400(BACT) and 62-210.200(PTE), F.A.C.]

EMISSIONS STANDARDS

5. Visible Emissions: Visible emissions from each gas-fired fuel heater shall not exceed 10% opacity (6-minute block average) except for ~~10%~~ 6-minute block average, which shall not exceed 20% opacity due to startups, shutdowns or malfunctions. [Rule 62-212.400(BACT), F.A.C.] . [Comment: The deleted phrases better clarify the intent of the condition. Also, the terminology can be confusing since there are no criteria specified in the permit.]

TESTING, RECORDS, AND REPORTING

6. Fuel Consumption: Equipment shall be installed and maintained to monitor the consumption of natural gas for each fuel heater. The monitoring system shall be capable of totaling the daily natural gas consumption. Natural gas consumption shall be reported in the Annual Operating Report. [40 CFR 60, Subpart Dc; Rule 62-210.370(2), F.A.C.]
7. Fuel Sulfur: Compliance with the fuel sulfur limit for natural gas shall be demonstrated by keeping reports obtained of the sulfur content required in Section III, Part A. ~~from the vendor indicating the average sulfur content of the natural gas being supplied from the pipeline for each month of operation. Methods for determining the sulfur content of the natural gas shall be ASTM methods D4084-82, D3246-81 or more recent versions.~~[Rule 62-4.070(3), F.A.C.] [Comment: The fuel heaters will use the same natural gas as the combustion turbines and any sulfur monitoring condition specific to the fuel heaters is unnecessary.]

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

B. GAS-FIRED FUEL HEATERS

8. Visible Emissions Tests: To determine compliance with the visible emissions standard, the permittee shall conduct testing in accordance with EPA Method 9. Initial compliance tests shall be conducted within 60 days of initial startup. Annual tests shall be conducted during each federal fiscal year if the hours of operation exceed 400 hours within the annual period. The permittee shall notify the Compliance Authority of scheduled tests at least 15 days in advance. Test results shall be submitted to the Compliance Authority within 45 days of conducting the tests. [40 CFR 60, Appendix A; Rules 62-204.800(7), 62-297.310(7)(a)9, 62-297.310(8)(c), F.A.C.] [Comment: Annual compliance tests are unnecessary for these small fuel gas heaters that exclusively fire natural gas.]

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

C. COOLING TOWER

This section of the permit addresses the following new emissions unit.

ID	Emission Unit Description
020	18-cell mechanical draft cooling tower

EQUIPMENT

1. Cooling Tower: The permittee is authorized to install one new 18-cell mechanical draft cooling tower with the following design characteristics: a circulating water flow rate of 310,000 gpm; design hot/cold water temperatures of 104° F/90° F; a design air flow rate of 1,386,055 per cell; a liquid-to-gas air flow ratio of 1.4; and drift eliminators with a drift rate of no more than 0.001 percent. The permittee shall submit the final design details within 60 days of selecting the vendor. [Application; Design]

EMISSIONS AND PERFORMANCE REQUIREMENTS

2. Drift Rate: The cooling tower shall be designed, ~~operated, and maintained to reduce~~ to meet a ~~the~~ drift rate of no more than 0.001 percent of the circulating water flow rate. The permittee shall provide such a certification to the Department upon construction of the cooling tower. *{Permitting Note: This work practice standard is established as BACT for PM/PM10 emissions from the cooling tower. Based on this design criteria, potential emissions are expected to be less than 34 tons of PM per year and less than 10 tons of PM10 per year. Actual emissions are expected be less than half these rates.}*. [Rule 62-212.400(BACT), F.A.C.]{Comment: Once constructed there are no operational or maintenance requirements regarding the drift eliminators.}

SECTION IV. APPENDIX Da

NSPS SUBPART Da REQUIREMENTS FOR DUCT BURNERS

Except as provided below, the duct burners in the heat recovery steam generators (HRSGs) are subject to the applicable requirements of Subpart A (General Provisions) and Subpart Da (Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978) established as New Source Performance Standards in 40 CFR 60 and adopted by reference in Rule 62-204.800(7)(b), F.A.C. The specific federal requirements are not listed, but can be obtained from the Department upon request. [Some of the NSPS requirements are being waived, so this notation is appropriate.]

NSPS GENERAL PROVISIONS

The emissions units are subject to the applicable General Provisions of the New Source Performance Standards including 40 CFR 60.7 (Notification and Record Keeping), 40 CFR 60.8 (Performance Tests), 40 CFR 60.11 (Compliance with Standards and Maintenance Requirements), 40 CFR 60.12 (Circumvention), 40 CFR 60.13 (Monitoring Requirements), and 40 CFR 60.19 (General Notification and Reporting Requirements), except as provided below. [Some of the NSPS requirements are being waived, so this notation is appropriate.]

NSPS SUBPART Da REQUIREMENTS

The duct burners in the heat recovery steam generators (HRSGs) shall comply with the following federal requirements of 40 CFR 60, Subpart Da, except as provided below.:

- § 60.40a Applicability and designation of affected facility.
- § 60.41a Definitions.
- § 60.42a Standard for particulate matter.
- § 60.43a Standard for sulfur dioxide.
- § 60.44a Standard for nitrogen oxides.
- § 60.46a Compliance provisions.
- § 60.47a Emission monitoring.
- § 60.48a Compliance determination procedures and methods.
- § 60.49a Reporting requirements.

~~Permitting Notes:~~ [These provisions should be regular conditions of the permit rather than permitting notes.]

- The duct burners have a heat input greater than 250 MMBtu per hour and are subject to NSPS Subpart Da.
- Particulate matter emissions are limited to 0.03 lb/million Btu heat input derived from the combustion of gaseous fuel. The exclusive firing of natural gas with a sulfur content not to exceed, on average, 2 grains per 100 standard cubic feet of gas ~~is expected to~~ will result in particulate matter emissions of less than 0.008 lb/MMBtu. Initial performance testing and monitoring under 40 CFR 60.46a, 60.47a, and 60.48a are not required to demonstrate compliance with the applicable particulate matter limit. [Without this or similar language, an initial performance test using EPA Method 19 would be required. As established in the BACT determination and PSD permit, stack testing for particulate matter is unnecessary.]]
- Sulfur dioxide emissions are limited to 0.20 lb/million Btu heat input based on 100 percent of the potential combustion concentration (zero percent reduction). The exclusive firing of natural gas with a sulfur content not to exceed, on average, 2 grains per 100 standard cubic feet of gas will ~~is expected to~~ result in sulfur dioxide emissions of less than 0.005 lb/MMBtu. Initial performance testing and monitoring under 40 CFR 60.46a, 60.47a, and 60.48 are not required to demonstrate compliance with the applicable sulfur dioxide limit. [Without this or similar language, an initial performance test using EPA Method 19 would be required. As established in the BACT determination and PSD permit, stack testing for sulfur dioxide is unnecessary.]

□

- Nitrogen oxide emissions are limited to 1.6 pounds per megawatt-hour (MWhr) (gross energy output) as provided under § 60.46a(k)(1). Compliance with the emissions limit is determined by the three-run average (nominal 1-hour runs) for the initial performance test under 40 CFR 60.46a(k) ~~and subsequent performance tests~~. The combined gas turbine and duct burner emissions are limited to 2.5 parts per million (ppm) under BACT (equivalent to 0.1 lb/MW-hr), which is much lower than the NSPS standard. ~~readily comply with this standard~~. Compliance with the BACT

SECTION IV. APPENDIX Da

NSPS SUBPART Da REQUIREMENTS FOR DUCT BURNERS

limit of 2.5 ppm, determined using a continuous emissions monitoring system, will ensure compliance with the NSPS limit of 1.6 lb/MWhr and no subsequent stack tests are required. [Future stack testing, beyond the initial performance test, should not be necessary with the very low 2.5 ppm limit that applies to these units.]

SECTION IV. APPENDIX Dc

NSPS SUBPART Dc REQUIREMENTS FOR GAS-FIRED FUEL HEATERS

The following emissions units are subject to the applicable requirements of Subpart A (General Provisions) and Subpart Dc (Small Industrial Commercial Institutional Steam Generating Units) established as New Source Performance Standards in 40 CFR 60 and adopted by reference in Rule 62-204.800(7)(b), F.A.C. The specific federal requirements are not listed, but can be obtained from the Department upon request.

ID	Emission Unit Description
013	Four gas-fired fuel heaters

NSPS GENERAL PROVISIONS

The emissions units are subject to the applicable General Provisions of the New Source Performance Standards including 40 CFR 60.7 (Notification and Record Keeping), 40 CFR 60.8 (Performance Tests), 40 CFR 60.11 (Compliance with Standards and Maintenance Requirements), 40 CFR 60.12 (Circumvention), 40 CFR 60.13 (Monitoring Requirements), and 40 CFR 60.19 (General Notification and Reporting Requirements).

NSPS SUBPART Dc REQUIREMENTS

The gas-fired fuel heaters shall comply with the following federal requirements of 40 CFR 60, Subpart Dc:

- ~~§ 60.40e Applicability and delegation of authority.~~
- ~~§ 60.41e Definitions.~~
- ~~§ 60.42e Standard for sulfur dioxide.~~
- ~~§ 60.43e Standard for particulate matter.~~
- ~~§ 60.44e Compliance and performance test methods and procedures for sulfur dioxide.~~
- ~~§ 60.45e Compliance and performance test methods and procedures for particulate matter.~~
- ~~§ 60.46e Emission monitoring for sulfur dioxide~~
- ~~§ 60.47e Emission monitoring for particulate matter.~~
- ~~§ 60.48e Reporting and record keeping requirements.~~

Permitting Notes:

- ~~☐ NSPS Subpart Dc defines steam generating unit to mean, "... a device that combusts any fuel and produces steam or heats water or any other heat transfer medium." Because the fuel heaters have a heat input of 22 MMBtu per hour each and heat natural gas prior to combustion in the gas turbines, the units are subject to NSPS Subpart Dc.~~
- ~~☐ Because the fuel heaters fire only natural gas, these units are subject only to notification, record keeping, and reporting requirements. The Department believes that the specific conditions of the permit are sufficient to demonstrate compliance with NSPS Subpart Dc.~~

SECTION IV. APPENDIX GC
GENERAL CONDITIONS

SECTION IV. APPENDIX GG

NSPS SUBPART GG REQUIREMENTS FOR GAS TURBINES

Except as provided below, the following emissions units are subject to the applicable requirements of Subpart A (General Provisions) and Subpart GG (Stationary Gas Turbines) established as New Source Performance Standards in 40 CFR 60 and adopted by reference in Rule 62-204.800(7)(b), F.A.C. The specific federal requirements are not listed, but can be obtained from the Department upon request. [Some of the NSPS requirements are being waived, so this notation is appropriate.]

ID	Emission Unit Description
011	Unit 8A Gas Turbine (170 MW) with Heat Recovery Steam Generator
012	Unit 8B Gas Turbine (170 MW) with Heat Recovery Steam Generator
017	Unit 8C Gas Turbine (170 MW) with Heat Recovery Steam Generator
018	Unit 8D Gas Turbine (170 MW) with Heat Recovery Steam Generator

NSPS GENERAL PROVISIONS

The emissions units are subject to the applicable General Provisions of the New Source Performance Standards including 40 CFR 60.7 (Notification and Record Keeping), 40 CFR 60.8 (Performance Tests), 40 CFR 60.11 (Compliance with Standards and Maintenance Requirements), 40 CFR 60.12 (Circumvention), 40 CFR 60.13 (Monitoring Requirements), and 40 CFR 60.19 (General Notification and Reporting Requirements), except as provided below. [Some of the NSPS requirements are being waived, so this notation is appropriate.]

NSPS SUBPART GG REQUIREMENTS

The gas turbines shall comply with the following federal requirements, except as provided below.

- § 60.330 Applicability and designation of affected facility.
- § 60.331 Definitions.
- § 60.332 Standard for Nitrogen Oxides.
- § 60.333 Standard for Sulfur Dioxide.
- § 60.334 Monitoring of Operations.
- § 60.335 Test Methods and Procedures.

Permitting Notes:

- *Based on the manufacturer's data and compressor inlet conditions of 59° F and 60% relative humidity, the heat rate for gas firing is 9250 Btu/KW-h at peak load and for oil firing is 9960 Btu/KW-h at peak load. This results in "Y" values of 9.8 for gas firing and 10.5 for oil firing. The equivalent NSPS NOx emission standards are 110/103 ppmvd at 15% oxygen for gas/oil firing. The emissions standards of the PSD permit are more stringent than this requirement. When firing natural gas, the "F" value (NOx allowance for fuel bound nitrogen shall be assumed to be 0. See EPA's March 12, 1993 determination regarding the use of NOx CEMS. [This notation should be deleted or the determination should be attached.]*
- *The gas turbine is limited to firing any fuel that contains sulfur in excess of 0.8 percent by weight.*
- *The requirement to monitor the nitrogen content of natural gas fired (~~Martin only~~) and fuel oil is waived. A NOx CEMS complying with the requirements of 40 CFR Part 75 shall be used to demonstrate compliance with the NOx limits of this permit. This is consistent with the custom fuel monitoring policy and guidance from EPA Region 4. [This note will clarify the certification requirements for the CEM and prevent any potential conflicts between Parts 60 and 75 monitoring certification requirements.]*
- *The permit contains a custom monitoring schedule for determining the sulfur content of fuels that is sufficient to demonstrate compliance with the NSPS limit. It is consistent with the custom fuel monitoring policy and guidance from EPA Region 4.*
 - *The permittee shall apply for an Acid Rain permit within the deadlines specified in 40 CFR 72.30.*

SECTION IV. APPENDIX GG

NSPS SUBPART GG REQUIREMENTS FOR GAS TURBINES

- The permittee shall submit a monitoring plan, certified by signature of the Designated Representative, that commits to the use of natural gas (sulfur content less than 2 gr/100 scf) ~~(Martin only)~~ and fuel oil for the CT's.
- Each unit shall be monitored for SO₂ emissions using methods consistent with the requirements of 40 CFR 75 and certified by the USEPA.
- ~~(Martin only)~~ The following monitoring schedule for No. 2 or superior grade fuel oil shall be followed: For all bulk shipments of No. 2 or superior grade fuel oil received at the Martin Power Plant, an analysis which reports the sulfur content of the fuel shall be provided by the fuel vendor. The analysis shall also specify the methods by which the analyses were conducted and shall comply with the requirements of 40 CFR 60.335(d).

[This custom fuel monitoring schedule has previously been approved by EPA and DEP, is included in the current PSD permit for the two existing Martin combustion turbines, and would be appropriate for the new Martin ~~and Monatee~~ units as well.]

- Emissions in excess of the NSPS standard for nitrogen oxides shall be determined on 1-hour basis. The continuous compliance demonstration by NO_x CEM system data shall substitute for the NSPS requirements regarding the water-to-fuel ratio. NO_x CEM system data shall be used to determine "excess emissions" for purposes of 40 CFR 60.7 subject to the conditions of the permit. ~~As required by EPA's March 12, 1993 determination, the NO_x monitor shall meet the applicable requirements of 40 CFR 60.13, Appendix B and Appendix F for certifying, maintaining, operating and assuring the quality of the system, shall be capable of calculating NO_x emissions concentrations corrected to 15% oxygen, shall have no less than 95% monitor availability in any given calendar quarter, and shall provide a minimum of four data points for each hour and calculate an hourly average. The requirements for the CEM systems specified by the specific conditions of this permit satisfy these requirements.~~ [The monitor should meet 40 CFR Part 75, rather than Part 60, requirements. The 95 percent monitor availability requirement is not established under NSPS, but is included in the permit as a BACT requirement.]
- Emissions in excess of the NSPS standard for sulfur dioxide shall be determined on a daily basis. However, the frequency specified in the custom fuel monitoring schedule is sufficient to demonstrate compliance with the with the NSPS limit. It is consistent with the custom fuel monitoring policy and guidance from EPA Region 4.
- The permittee is required to submit a semiannual report of emission in excess of the NSPS standards as required by 40 CFR 60.7, Subpart A, General Provisions.
- The Department may request that NO_x emission data also be presented in terms of the NSPS standard (NO_x at 15 percent O₂ and ISO standard ambient conditions, volume percent). The permittee is not required to have the NO_x monitor continuously correct NO_x emissions concentrations to ISO conditions. However, the permittee shall keep records of the data needed to make the correction, and shall make the correction when required by the Department or Administrator. This is consistent with guidance from EPA Region 4.
- The permittee is allowed to conduct initial performance tests at a single load because the permit requires demonstration of continuous compliance with the NO_x BACT standards. This is consistent with guidance from EPA Region 4. ~~(Martin only)~~ Initial performance tests on the two existing combustion turbines have already been completed and no additional stack testing is required.
- The permittee is allowed to make the initial compliance demonstration for NO_x emissions using certified CEM system data, provided that compliance is based on a minimum of three test runs representing a total of at least three hours of data, and that the CEMS be calibrated in accordance with the procedure in section 6.2.3 of Method 20 following each run. Alternatively, initial compliance may be demonstrated using data collected during the initial relative accuracy test audit (RATA) performed pursuant to 40 CFR Part 75 ~~on the NO_x monitor~~. The span value specified in 40 CFR Part 75 ~~the permit~~ shall be used instead of that specified in the NSPS requirements. ~~Flow rate~~ Data shall be obtained to calculate mass emission rates. These initial compliance demonstration requirements are consistent with guidance from EPA Region 4. The span value is changed pursuant to Department authority and is consistent with guidance from EPA Region 4.

SECTION IV. APPENDIX GG

NSPS SUBPART GG REQUIREMENTS FOR GAS TURBINES

- *The permit specifies sulfur testing methods and allows the permittee to follow the requirements of 40 CFR 75 Appendix D to determine the sulfur content. These requirements allow different methods than provided by the NSPS requirements, but are equally stringent and will ensure compliance with this rule.*
- *The fuel analysis requirements of the permit meet or exceed the NSPS requirements and ensure compliance.*

SECTION IV. APPENDIX SC
STANDARD CONDITIONS

Golder Associates Inc.

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Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603



August 7, 2002

0137609

Mr. C.H. Fancy, P.E., Chief
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Attention: Mr. Jeff Koerner, New Source Review Section

RE: REVISED REGIONAL HAZE ANALYSIS FOR THE PREVENTION OF SIGNIFICANT
DETERIORATION APPLICATION FOR THE FPL MARTIN EXPANSION PROJECT

Dear Jeff:

On behalf of Florida Power and Light Company (FPL), Golder Associates Inc. (Golder) is providing a revised regional haze analysis for the proposed Martin Expansion Project. The revision is due to a change made to the nitrate switch setting in the CALPOST program.

The change results in higher regional haze impacts for the proposed project. The resulting maximum values (i.e., 1.91 percent for simple-cycle operation and 4.90 percent for combined-cycle operation on fuel oil) remain below the Federal Land Manager's visibility screening criteria of 5 percent. There are no other changes to the application.

Attached are the pages that were revised in the Air Construction Permit/PSD application. The revised air modeling computer files are being provided electronically to Cleve Holladay. If you have any questions, please call me at (352) 336-5600 ext 539 or Ken Kosky at ext 516. Thank you.

Sincerely yours,

GOLDER ASSOCIATES INC.

A handwritten signature in black ink that reads 'Steven R. Marks'.

Steven R. Marks, CCM
Associate

A handwritten signature in black ink that reads 'Kennard F. Kosky'.

Kennard F. Kosky, PE
Project Manager

Attachments

SRM/jkw

cc: K. H. Simmons, FPL
C. Holladay, DEP

distance due to the scattering and absorption by gases and particles in the atmosphere. A change in the extinction coefficient produces a perceived visual change. An index that simply quantifies the percent change in visibility due to the operation of a source is calculated as:

$$\Delta\% = (b_{\text{exts}} / b_{\text{extb}}) \times 100$$

where: b_{exts} is the extinction coefficient calculated for the source, and
 b_{extb} is the background extinction coefficient.

The purpose of the visibility analysis is to calculate the extinction at each receptor for each day (24-hour period) of the year due to the proposed Project. The criteria to determine if the Project's impacts are potentially significant are based on a change in extinction of 5 percent or greater for any day of the year.

Processing of visibility impairment for this study was performed with the CALPUFF model (see Appendix D) and the CALPUFF post-processing program CALPOST. The analysis was conducted in accordance with the most recent guidance from the FLAG report (December 2000). The CALPUFF postprocessor model CALPOST is used to calculate the combined visibility effects from the different pollutants that are emitted from the Project. Daily background extinction coefficients are calculated on a hour-by-hour basis using hourly relative humidity data from CALMET and hygroscopic and non-hygroscopic extinction components specified in the FLAG document. For the Class I area evaluated, the hygroscopic and non-hygroscopic components are 0.9 and 8.5 inverse mega meter (Mm^{-1}). CALPOST then predicts the percent extinction change for each day of the year.

The regional haze analysis was performed for both simple cycle and combined cycle configurations. For simple cycle configuration, the analysis was performed for two simple cycle units (Units 8C and 8D) since two simple cycle units (Units 8A and 8B) are existing units and modeling was performed for these units when originally permitted. The simple cycle configuration of these units not being modified, but is modified by the combined cycle configuration. For combined cycle configuration, the emissions inventory was adjusted to remove double counting emissions of PM/PM₁₀, sulfur dioxide (SO₂) and sulfuric acid mist. The emissions of these pollutants were determined independently as provided in Appendix A. For PM/PM₁₀, emissions were increased by conservatively assuming that 9.8 percent of the SO₂ was converted to particulate by the reaction of

ammonia used in the SCR system with SO_3 to form ammonium sulfate. Sulfuric acid mist emissions were conservatively assumed to be 10 percent of the SO_2 emissions. The overall conversion of SO_2 to particulate and sulfuric acid mist was assumed to be about 20 percent (i.e., 19.8 percent), which provided very conservative emission rates for individual pollutants. However, no change in the potential SO_2 emission was made and it was assumed that the preferential reaction of ammonia and SO_3 was not controlling. To eliminate double counting of SO_2 conversions in the regional haze analysis when firing oil, the actual sulfuric acid missions and additional particulate emissions were assumed to be one-half of the values when the pollutant formation is considered separately. In addition, the SO_2 emissions are reduced proportionally based on the conversion of PM/PM_{10} and sulfuric acid mist. These assumptions provide conservative emission estimates for the regional haze analysis.

Results

The results of the refined regional haze analysis are presented in Table 7-5. The results indicate that the proposed Project's maximum predicted impact on visibility at the Everglades NP is 4.90 percent for the combined-cycle operation on fuel oil. The maximum predicted impact on visibility when firing natural gas is 1.91 percent. The values are below the FLM's screening criteria of 5 percent change. Therefore, the Project is not expected to have an adverse impact on the existing regional haze in the Everglades NP.

7.4.3 SULFUR AND NITROGEN DEPOSITION

General Methods

As part of the AQRV analyses, total nitrogen (N) and sulfur (S) deposition rates were predicted at the Everglades NP Class I area. The deposition analysis thresholds (DAT) are based on the annual averaging period. The total deposition is estimated in units of kilogram per hectare per year (kg/ha/yr) of nitrogen or sulfur. The CALPUFF model is used to predict wet and dry deposition fluxes of various oxides of these elements.

For N deposition, the species include:

- Particulate ammonium nitrate (from species NO_3), wet and dry deposition;
- Nitric acid (species HNO_3), wet and dry deposition;
- NO_x , dry deposition; and
- Ammonium sulfate (species SO_4), wet and dry deposition.

For S deposition, the species include:

- SO₂, wet and dry deposition; and
- SO₄, wet and dry deposition.

The CALPUFF model produces results in units of $\mu\text{g}/\text{m}^2/\text{s}$. The modeled deposition rates are then converted to N or S deposition in kg/ha respectively, by using a multiplier equal to the ratio of the molecular weights of the substances (IWAQM Phase II report Section 3.3).

Deposition analysis thresholds (DAT) for nitrogen and sulfur deposition of 0.01 kg/ha/yr were provided by the U.S. Fish and Wildlife Service (January 2002). A DAT is the additional amount of N or S deposition within a Class I area, below which estimated impacts from a proposed new or modified source are considered insignificant. The maximum N and S depositions predicted for the Project are, therefore, compared to these DAT or significant impact levels.

Results

The maximum predicted N and S depositions predicted for the Project in the PSD Class I area of the Everglades NP are summarized in Table 7-6. The maximum N and S deposition rates for the Project are predicted to be 0.0015 and 0.0004 kg/ha/yr, respectively. These maximum deposition rates are below the significant impact levels for N and S of 0.01 kg/ha/yr. As a result, the Project's emissions are not expected to have a significant adverse effect on N and S deposition at the Class I area.

Table 7-5. Maximum 24-hour Average Visibility Impairment Predicted for the Project at the PSD Class I Area of the Everglades NP

Operating Mode	Maximum Visibility Impairment (%) ^a		Visibility Impairment Criteria (%)
	Natural Gas	Fuel Oil	
Combined-Cycle	1.91	4.90	5.0
Simple-Cycle (2 Units)	0.82	3.2	5.0

^a Concentrations are highest predicted using CALPUFF model and 1990 CALMET wind field for south Florida. Background extinctions calculated using FLAG Document (December 2000) values and hourly relative humidity data.

^b Concentrations predicted for combined- and simple cycle operation are based on the operating scenario with the maximum hourly emissions. For both natural gas- and oil-firing, maximum emissions are based on the combustion turbines operating for baseload conditions at an ambient temperature of 35°F.

For combined cycle operation and natural gas-firing, duct burner emission are included. For simple cycle operation and natural gas-firing, combustion turbines are assumed to operate at higher power mode.