

# Department of Environmental Protection

Jeb Bush  
Governor

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

David B. Struhs  
Secretary

January 29, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Walter P. Bussels, Managing Director and CEO  
Jacksonville Electric Authority  
Kennedy Generating Station  
21 West Church Street  
Jacksonville, Florida 32202-3139

Re: DEP File No.0310047-002AC  
JEA Kennedy Generating Station  
170 MW Simple Cycle Peaking Unit

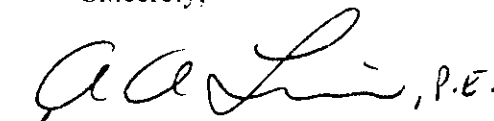
Dear Mr. Bussels:

Enclosed is one copy of the Draft Permit, Technical Evaluation and Preliminary Determination, for the referenced project in Duval County. The Department's Intent to Issue Permit and the "PUBLIC NOTICE OF INTENT TO ISSUE" are also included.

The "Public Notice of Intent to Issue Permit" must be published as soon as possible in a newspaper of general circulation in the area affected. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

Please submit any written comments you wish to have considered concerning the Department's proposed action to A. A. Linero, P.E., Administrator, New Source Review Section at the above letterhead address. If you have any questions, please call Ms. Teresa Heron at 850/921-9529.

Sincerely,

  
for C. H. Fancy, P.E., Chief,  
Bureau of Air Regulation

CHF/th

Enclosures

# NOTICE TO BE PUBLISHED IN THE NEWSPAPER

## PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. 0310047-002-AC

Jacksonville Electric Authority Kennedy Generating Station  
170 Megawatt Combustion Turbine-Electrical Generator  
Duval County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to Jacksonville Electric Authority (JEA). The permit is to install a nominal 170 megawatt natural gas and No. 2 fuel oil-fired combustion turbine-electrical generator to replace a natural gas and fuel oil-fired steam electrical unit (KE10) at the Kennedy Generating Station in Jacksonville, Duval County. A Best Available Control Technology (BACT) determination was not required pursuant to Rule 62-212.400, F.A.C. The applicant's name and address are Jacksonville Electric Authority, 21 West Church Street, Jacksonville, Florida 32202-3139.

The proposed unit is a nominal 170 megawatt General Electric MS7241FA gas and No. 2 fuel oil-fired combustion turbine-electrical generator and a 90 foot stack. The unit will operate a maximum of 4050 hours on natural gas or 1260 hours on No. 2 fuel oil with a maximum sulfur content of 0.05%. It will operate for various combinations of hour on either fuel such that the annual emissions increases in carbon monoxide (CO) and nitrogen oxides (NO<sub>x</sub>) remain at or below the values given below. The proposed unit will operate only in a simple cycle mode.

NO<sub>x</sub> emissions while firing natural gas, will be controlled by Dry Low NO<sub>x</sub> (DLN-2.6) combustors tuned to achieving emissions of 15 parts per million (ppm) by volume at 15 percent oxygen. During oil firing, NO<sub>x</sub> emissions will be 42 ppm and controlled by wet injection. Emissions of carbon monoxide (CO) for gas and oil firing will be controlled to 15 and 20 ppm, respectively. Emissions of volatile organic compounds (VOC) will be 1.4 and 3.5 ppm for gas and oil firing, respectively. Emissions of sulfur dioxide (SO<sub>2</sub>), sulfuric acid mist (SAM), and particulate matter (PM/PM<sub>10</sub>) will be very low because of the limited hours of operation and use of clean fuels.

The proven capabilities of the selected unit, together with the operational restrictions, will ensure that the annual emission levels required to avoid PSD Review are attained. There will be very small decreases in regulated air pollutants. However the unit will be able to produce substantially more electrical energy while maintaining maximum total annual emissions near past levels. Actual emissions will likely be substantially lower because the unit will primarily operate in intermittent duty. The maximum potential annual emissions in tons per year are summarized below along with the most recent annual emissions from Boiler KE10 (Unit 009) slated for retirement, the changes due to the project, and the PSD-significant levels.

<u>Pollutants</u>	<u>KE10 Actual Emissions</u>	<u>CT Potential Emissions</u>	<u>Change</u>	<u>PSD Significant Levels</u>
PM/PM <sub>10</sub>	21.7	18.2	-3.5	25/15
SAM	11.9	6.3	-5.6	7
SO <sub>2</sub>	266	62	-204	40
NO <sub>x</sub>	161.5	200.5	39	40
VOC	1.6	5.7	4.1	40
CO	14.5	97.2	82.7	100

An air quality impact analysis was not required or conducted. No significant impacts are due as a result of this project.

The Department will issue the FINAL permit with the attached conditions 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 concerning the proposed permit issuance action for a period of thirty (30) days from the date of publication of "Public Notice of Intent to Issue Air Construction Permit." Written comments 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 written 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.

# NOTICE TO BE PUBLISHED IN THE NEWSPAPER

The JEA Kennedy Generating Station combustion turbine-electrical generator project is not subject to review under Section 403.506 F.S. (Power Plant Siting Act), because it provides for no expansion in steam generating capacity.

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. 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 (14) 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 (14) 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, as well as the rules and statutes which entitle the petitioner to relief; and (f) A demand for relief.

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

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:

Dept. of Environmental Protection Bureau of Air Regulation 111 S. Magnolia Drive, Suite 4 Tallahassee, Florida, 32301 Telephone: 850/488-0114 Fax: 850/922-6979	Regulatory & Environmental Services Dept. Air & Water Quality Division 117 W. Duval Street, Suite 225, Jacksonville, Florida 32202 Telephone: 850/630-3484 Fax: 850/630-3638	Dept. of Environmental Protection Northeast District Office 7825 Baymeadows Way, Suite 200B Jacksonville, Florida 32256-7590 Telephone: 850/448-4300 Fax: 850/448-4363
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The complete project file includes the application, technical evaluations, Draft Permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information.

In the Matter of an  
Application for Permit by:

Mr. Walter P. Bussels, Managing Director and CEO  
Jacksonville Electric Authority  
21 West Church Street  
Jacksonville, Florida 32202-3139

DEP File No. 0310047-002-AC  
170 MW Combustion Turbine Project  
Simple Cycle Peaking Unit  
Duval County

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**INTENT TO ISSUE AIR CONSTRUCTION PERMIT**

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit (copy of DRAFT Permit attached) for the proposed project, detailed in the application specified above and the attached Technical Evaluation and Preliminary Determination, for the reasons stated below.

The applicant, Jacksonville Electric Authority (JEA), applied on October 30, 1998 to the Department to construct/install a nominal 170 megawatt natural gas and No. 2 fuel oil-fired combustion turbine-electrical generator to replace a natural gas and fuel oil-fired steam electrical unit (KE10) at the Kennedy Generating Station in Jacksonville, Duval County.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-212. The above actions are not exempt from permitting procedures. The Department has determined that an air construction permit is required to conduct the work.

The Department intends to issue this air construction permit based on the belief that reasonable assurances have been provided to indicate that operation of these emission units will not adversely impact air quality, and the emission units will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297, F.A.C.

Pursuant to Section 403.815, F.S., and Rule 62-110.106(7)(a)1., F.A.C., you (the applicant) are required to publish at your own expense the enclosed "Public Notice of Intent to Issue Air Construction Permit." The notice shall be published one time only in the legal advertisement section of a newspaper of general circulation in the area affected. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. Where there is more than one newspaper of general circulation in the county, the newspaper used must be one with significant circulation in the area that may be affected by the permit. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-0114; Fax 850/922-6979). The Department suggests that you publish the notice within thirty days of receipt of this letter. You must provide proof of publication within seven days of publication, pursuant to Rule 62-110.106(5), F.A.C. No permitting action for which published notice is required shall be granted until proof of publication of notice is made by furnishing a uniform affidavit in substantially the form prescribed in section 50.051, F.S. to the office of the Department issuing the permit or other authorization. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rules 62-110.106(9) & (11), F.A.C.

The Department will issue the final permit with the attached conditions 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 concerning the proposed permit issuance action for a period of thirty (30) days from the date of publication of "Public Notice of Intent to Issue Air Construction Permit." Written comments 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 written 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.

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, as well as the rules and statutes which entitle the petitioner to relief; and (f) A demand for relief.

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

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. Mediation is not available in this proceeding.


In addition to the above, a person subject to regulation has a right to apply for a variance from or waiver of the requirements of particular rules, on certain conditions, under Section 120.542 F.S. The relief provided by this state statute applies only to state rules, not statutes, and not to any federal regulatory requirements. Applying for a variance or waiver does not substitute or extend the time for filing a petition for an administrative hearing or exercising any other right that a person may have in relation to the action proposed in this notice of intent.

The application for a variance or waiver is made by filing a petition with the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. The petition must specify the following information: (a) The name, address, and telephone number of the petitioner; (b) The name, address, and telephone number of the attorney or qualified representative of the petitioner, if any; (c) Each rule or portion of a rule from which a variance or waiver is requested; (d) The citation to the statute underlying (implemented by) the rule identified in (c) above; (e) The type of action requested; (f) The specific facts that would justify a variance or waiver for the petitioner; (g) The reason why the variance or waiver would serve the purposes of the underlying statute (implemented by the rule); and (h) A statement whether the variance or waiver is permanent or temporary and, if temporary, a statement of the dates showing the duration of the variance or waiver requested.

The Department will grant a variance or waiver when the petition demonstrates both that the application of the rule would create a substantial hardship or violate principles of fairness, as each of those terms is defined in Section 120.542(2) F.S., and that the purpose of the underlying statute will be or has been achieved by other means by the petitioner.

Persons subject to regulation pursuant to any federally delegated or approved air program should be aware that Florida is specifically not authorized to issue variances or waivers from any requirements of any such federally delegated or approved program. The requirements of the program remain fully enforceable by the Administrator of the EPA and by any person under the Clean Air Act unless and until the Administrator separately approves any variance or waiver in accordance with the procedures of the federal program.

Executed in Tallahassee, Florida.

  
for C. H. Fancy, P.E., Chief  
Bureau of Air Regulation


CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this INTENT TO ISSUE AIR CONSTRUCTION PERMIT (including the PUBLIC NOTICE, Technical Evaluation and Preliminary Determination, and the DRAFT permit) was sent by certified mail (\*) and copies were mailed by U.S. Mail before the close of business on 1-29-99 to the person(s) listed:

Walter P. Bussels, JEA\*  
Bert Gianazza, JEA  
Chris Kurts, NED  
James L. Manning, P.E. RESD  
Gregg Worley, EPA  
John Bunyak, NPS  
Anthony L. Compaan, P.E., Black & Veatch

Clerk Stamp

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

  
(Clerk) 1-29-99  
(Date)

TECHNICAL EVALUATION  
AND  
PRELIMINARY DETERMINATION

Jacksonville Electric Authority

Kennedy Generating Station  
170 Megawatt Simple Cycle Peaking Unit

Duval County

DEP File No. 0310047-002-AC

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

January 29, 1999

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

## **1. APPLICATION INFORMATION**

### **1.1 Applicant Name and Address**

Jacksonville Electric Authority (JEA)  
21 West Church Street  
Jacksonville, Florida 32202-3139

Authorized Representative: Walter P. Bussels, Managing Director & CEO

### **1.2 Reviewing and Process Schedule**

10-30-98: Date of Receipt of Application  
11-25-98: DEP completeness request  
12-23-98: Application deemed complete.  
01-26-99: Issued Intent

## **2. FACILITY INFORMATION**

### **2.1 Facility Location**

Refer to Figure 1. The JEA Kennedy Generating Station is located at 4215 Talleyrand Ave in Jacksonville, Duval County. The UTM coordinates of this facility are Zone 17; 440.0 km E; 3,591.0 km N.

### **2.2 Standard Industrial Classification Codes (SIC)**

Industry Group No.	49	Electric, Gas, and Sanitary Services
Industry No.	4911	Electric Services

### **2.3 Facility Category**

The JEA Kennedy Generating Station produces electric power from three natural gas and fuel oil-fired steam units with a combined generating capacity of 250 megawatts (MW), a 21 MW natural gas and fuel oil-fired auxiliary boiler, and three No. 2 distillate fuel oil-fired simple cycle combustion turbines-electrical generator with a combined capacity of approximately 170 MW.

This facility is within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 100 TPY for at least one criteria pollutant, the facility is also a major facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD). Per Table 62-212.400-2, modifications at the facility resulting in emissions increases greater than 40 TPY of NO<sub>x</sub> or SO<sub>2</sub>, 25/15 TPY of PM/PM<sub>10</sub>, or 3 TPY of fluorides (F) require review per the PSD rules and a determination for Best Available Control Technology (BACT) per Rule 62-212.400, F.A.C. The present modification results in net emissions decreases or less-than-significant increases in PSD pollutants. Therefore the modification is not subject to PSD.

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



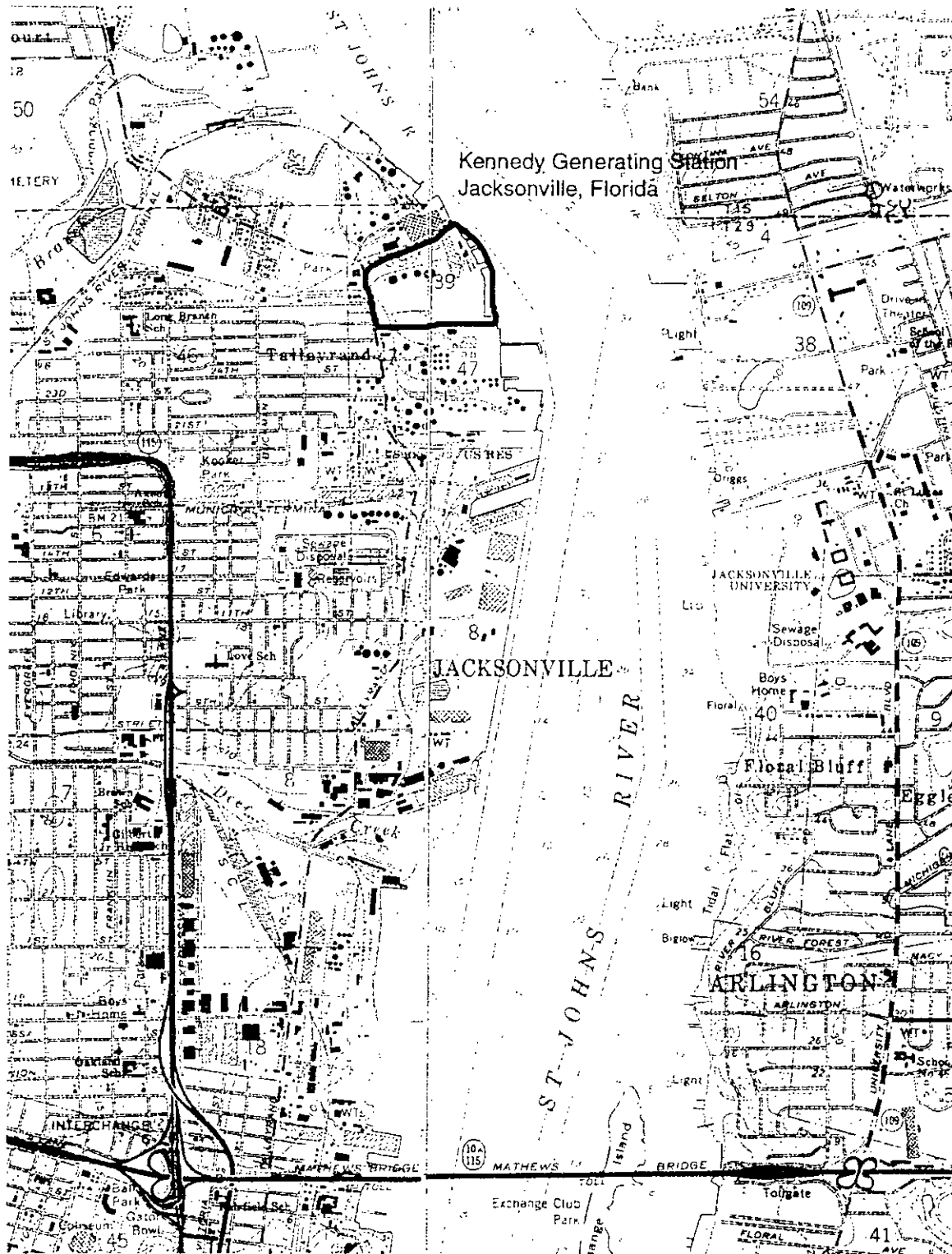


Figure 1 - Location of JEA Kennedy Generating Station

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

## 3. PROJECT DESCRIPTION

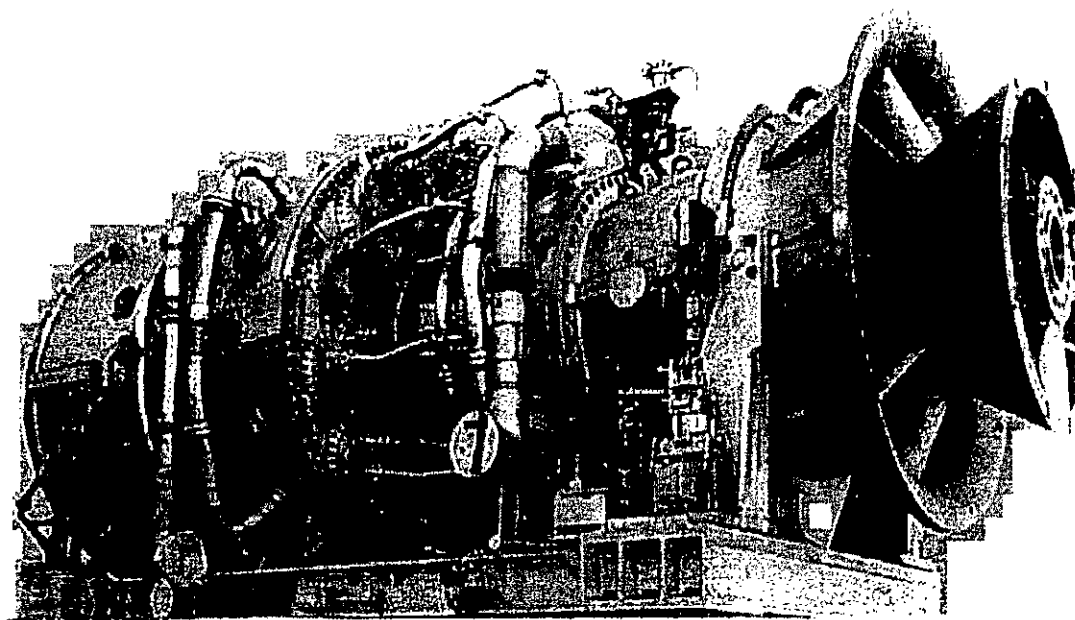
This permit addresses the following emissions unit:

EMISSION UNIT NO.	SYSTEM	EMISSION UNIT DESCRIPTION
00X	Power Generation	One 170 MW Combustion Turbine-Electrical Generator

JEA proposes to install a nominal 170 MW combustion turbine-electrical generator. The proposed unit is a General Electric PG 7241 FA combustion turbine that will burn natural gas and No. 2 distillate fuel oil. It will operate in simple cycle mode and intermittent duty. This turbine will replace an existing 150 MW natural gas and fuel oil-fired boiler identified by JEA as KE10 (ARMS Emission Unit 009) at the Kennedy Generating Station in Duval County. The project also includes a 90-foot new stack .

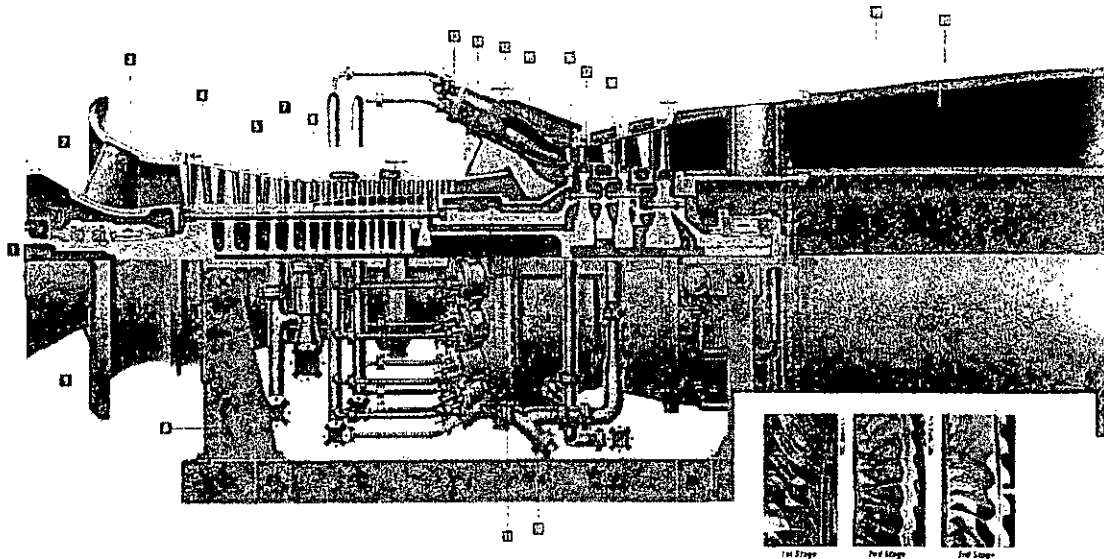
The prime mover and source of air pollution will be a General Electric PG7241FA (7FA) combustion turbine-electrical generator. It will be equipped with Dry Low NO<sub>x</sub> (DLN-2.6) combustors tuned to control NO<sub>x</sub> emissions to 15 ppmvd at 15% O<sub>2</sub> between 50 and 100% of full load conditions during normal operations. Both natural gas and maximum 0.05 % sulfur fuel oil will be used in the unit.

A photograph of a GE 7001FA (a predecessor of the PG 7241FA) is shown in Figure 2. An internal view is shown in Figure 3.



**Figure 2 - Photograph of General Electric MS 7001FA Combustion Turbine**

## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION



**Figure 3 - Internal View of General Electric MS 7001FA Combustion Turbine**

Hours of operation will be limited to 4050 hours per year on natural gas or 1260 hours per year on fuel oil. An algorithm is proposed by JEA to operate varying combinations of hours on natural gas and or fuel oil such that the maximum emissions do not exceed those related with exclusive firing of either fuel.

This combustion turbine will have a heat input of 1,623 million Btu per hour (natural gas) and 1822 million Btu per hour (fuel oil), *lower* heating value (MMBtu/hr, LHV) referenced to 59°F and 60 % relative humidity. At those heat input rates and conditions, the gross power output from the electrical generator is 173 MW for gas and 182 MW for oil.

Depending on compressor inlet conditions, full load power capacity will range from approximately 150 to 187 MW while burning gas and 160 to 191 while burning fuel oil.

Emission decreases will occur for carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub> mist or SAM), particulate matter (PM/PM<sub>10</sub>), volatile organic compounds (VOC) and nitrogen oxides (NO<sub>x</sub>). Net emission changes of these pollutants will be less than the significant emission levels per Table 62-212.400-2, F.A.C. Therefore review for the Prevention of Significant Deterioration (PSD) is not required.

According to the application, this unit will emit approximately 200 tons per year (TPY) of NO<sub>x</sub>, 97 TPY of CO, 18 TPY of PM/PM<sub>10</sub>, 62 TPY of SO<sub>2</sub>, 6 TPY of VOC, and 6 TPY of SAM.

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

## 4. PROCESS DESCRIPTION

Much of the following discussion is from a 1993 EPA document on Alternative Control Techniques for NO<sub>x</sub> Emissions from Stationary Gas turbines.<sup>1</sup> Project specific information is interspersed where appropriate.

A gas turbine is an internal combustion engine that operates with rotary rather than reciprocating motion. Ambient air is drawn into the 18-stage compressor of the GE 7FA where it is compressed by a pressure ratio of about 15 times atmospheric pressure. The compressed air is then directed to the combustor section, where fuel is introduced, ignited, and burned. The combustion section consists of 14 separate can-annular combustors.

Flame temperatures in a typical combustor section can reach 3600 degrees Fahrenheit (°F). Units such as the 7FA operate at lower flame temperatures which minimize NO<sub>x</sub> formation. The hot combustion gases are then diluted with additional cool air and directed to the turbine section at temperatures of approximately 2400 °F. Energy is recovered in the turbine section in the form of shaft horsepower, of which typically more than 50 percent is required to drive the internal compressor section. The balance of recovered shaft energy is available to drive the external load unit such as an electrical generator.

In the JEA project, the unit will operate primarily as a peaking unit in the simple cycle mode. Cycle efficiency, defined as a percentage of useful shaft energy output to fuel energy input, is approximately 35 percent for F-Class combustion turbines in the simple cycle mode. In addition to shaft energy output, 1 to 2 percent of fuel input energy can be attributed to mechanical losses. The balance is exhausted from the turbine in the form of heat. Figure 4 is a process flow diagram for this simple cycle operation.

In combined cycle operation, the gas turbine drives an electric generator while the exhausted gases are used to raise steam in a heat recovery steam generator (HRSG). In combined cycle mode, the thermal efficiency of the 7FA can exceed 56 percent.

Additional process information related to the combustor design, and control measures to minimize NO<sub>x</sub> formation are given in the control technology section below.

## 5. RULE APPLICABILITY

The proposed project is subject to preconstruction review requirements under the provisions of Chapter 403, Florida Statutes, and Chapters 62-4, 62-204, 62-210, 62-212, 62-214, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.).

This facility is located in Duval County, an area designated as unclassifiable for sulfur dioxide, as an air quality maintenance area for ozone and particulate matter in accordance with Rule 62-204.360, F.A.C. The proposed project is not subject to review under Rule 62-212.400., F.A.C., Prevention of Significant Deterioration (PSD), because the net emission increases for CO, VOC and NO<sub>x</sub> do not exceed the significant emission rates given in Chapter 62-212, Table 62-212.400-2, F.A.C.

The net emissions increase/decrease for all PSD pollutants as a result of this modification are calculated below:

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

## CONTEMPORANEOUS CREDITABLE CHANGES (TPY)

Pollutants	Past Emissions (Boiler KE10)	Future Emissions (170 MW CT)	Increase (decrease)	PSD Significance	PSD Review?
PM/PM <sub>10</sub>	21.7	18.2	(3.5)	25/15	No
SAM	11.9	6.3	(5.5)	7	No
SO <sub>2</sub>	266	62	(204)	40	No
NO <sub>x</sub>	161.5	200.5	39	40	No
VOC	1.6	5.7	4.1	40	No
CO	14.5	97.2	82.7	100	No

This evaluation consists of a review of the control technology for PM/PM<sub>10</sub>, VOC, CO, SO<sub>2</sub>, and NO<sub>x</sub> to insure that it is sufficient to restrict future emissions to levels lower than past emissions or net increases in emissions to levels less than the significant emission rates as described above. An analysis of the air quality impact from proposed project is required to insure that there are no exceedances of the National or State Ambient Air Quality Standards.

The emission unit affected by this permit shall comply with all applicable provisions of the Florida Administrative Code (including applicable portions of the Code of Federal Regulations incorporated therein) and, specifically, the following Chapters and Rules:

### 5.1 State Regulations

Chapter 62-4	Permits.
Rule 62-204.220	Ambient Air Quality Protection
Rule 62-204.240	Ambient Air Quality Standards
Rule 62-204.800	Federal Regulations Adopted by Reference
Rule 62-210.300	Permits Required
Rule 62-210.350	Public Notice and Comments
Rule 62-210.370	Reports
Rule 62-210.550	Stack Height Policy
Rule 62-210.650	Circumvention
Rule 62-210.700	Excess Emissions
Rule 62-210.900	Forms and Instructions
Rule 62-212.300	General Preconstruction Review Requirements
Chapter 62-213	Operation Permits for Major Sources of Air Pollution
Chapter 62-214	Requirements For Sources Subject To The Federal Acid Rain Program
Rule 62-296.320	General Pollutant Emission Limiting Standards
Rule 62-297.310	General Test Requirements
Rule 62-297.401	Compliance Test Methods
Rule 62-297.520	EPA Continuous Monitor Performance Specifications

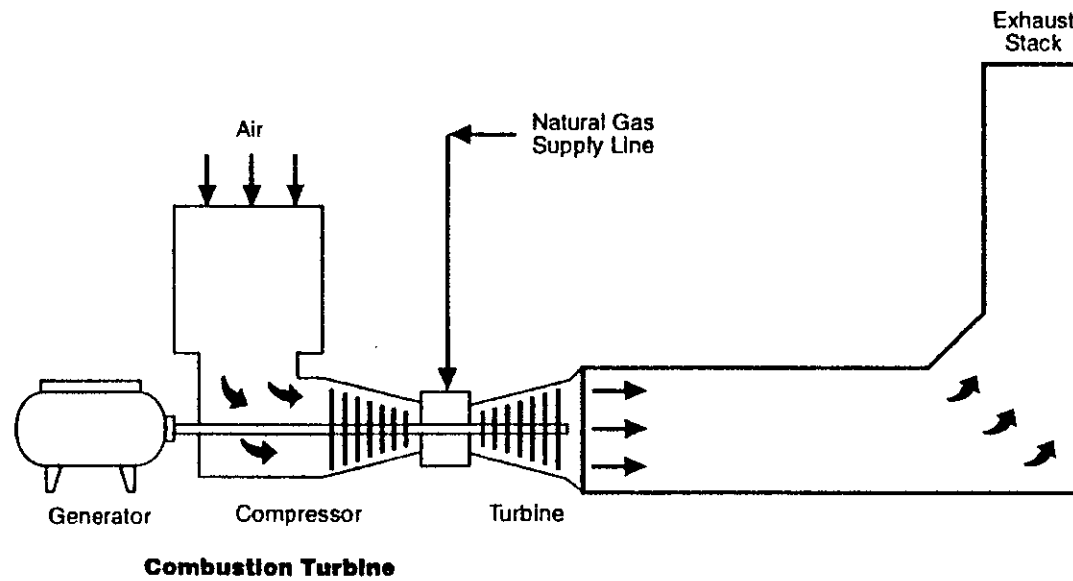


Figure 4 - Simple Cycle Combustion Turbine Process Flow Diagram

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

## 5.2 Federal Rules

40 CFR 60	NSPS Subparts GG
40 CFR 60	Applicable sections of Subpart A, General Requirements
40 CFR 72	Acid Rain Permits (applicable sections)
40 CFR 73	Allowances (applicable sections)
40 CFR 75	Monitoring (applicable sections including applicable appendices)
40 CFR 77	Acid Rain Program-Excess Emissions (future applicable requirements)

## 6. AIR POLLUTION CONTROL TECHNOLOGY

### 6.1 Applicant Control Technology Proposal

POLLUTANT	CONTROL TECHNOLOGY	PROPOSED LIMIT
PM/PM <sub>10</sub> (Non-Condensables)	Combustion Controls	9 lb/hr (NG)* 17 lb/hr (F.O.)*
Volatile Organic Compounds	As Above	1.4 ppm (NG) 3.5 ppm (F.O.)
Carbon Monoxide	As Above	15 ppm (NG) 20 ppm (F.O.)
Sulfur Dioxide	As Above	2 gr/100 scf (NG) 0.05% Sulfur Fuel Oil
H <sub>2</sub> SO <sub>4</sub>	As Above	10 lb/hr
Opacity	As Above	5 (NG) 20 (F.O.)
Nitrogen Oxides	Dry Low NO <sub>x</sub> - Natural Gas Wet Injection - Fuel Oil	15 ppm @ 15% O <sub>2</sub> (NG) 42 ppm @ 15% O <sub>2</sub> (F.O.)

### 6.2 Standards of Performance for New Stationary Sources

The minimum project control technology basis is 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines (NSPS). Subpart GG was adopted by the Department by reference in Rule 62-204.800, F.A.C. The key emission limits required by Subpart GG are 75 ppm NO<sub>x</sub> @15% O<sub>2</sub>. (assuming 25 percent efficiency) and 150 ppm SO<sub>2</sub> @15% O<sub>2</sub> (or <0.8% sulfur in fuel). The proposal is consistent with the NSPS which allows NO<sub>x</sub> emissions over 100 ppm for the high efficiency unit to be purchased by JEA. No National Emission Standards for Hazardous Air Pollutants exist for stationary gas turbines.

### 6.3 Determinations by EPA and States

Recent Best Available Control Technology (BACT) proposals and determinations for NO<sub>x</sub> in simple cycle gas turbine projects have ranged from 9 to 15 ppm @ 15% O<sub>2</sub> by Dry Low NO<sub>x</sub> Combustion or Hot Selective Catalytic Reduction. Values whiel firing oil are typically 42 ppm by wet injection. In addition to being a simple cycle project, this unit will operate as a "peaker" and emissions will not trigger PSD and BACT. JEA has proposed a limits of 15 ppm for gas firing and 42 ppm for oil firing, which will avoid PSD. These are within the

## **TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION**

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range of recent simple cycle, peaker BACT limits. Similarly, the proposed CO and VOC limits are within the range of recent BACT determinations for both simple and combined cycle projects.

### **6.4 Review of Combustion Turbine Control Technologies**

A complete discussion of control options was not required because the project is not subject to a Best Available Control Technology Determination. However the applicant discussed the technology to be employed in order to comply with the New Source Performance Standards and the requested limits. The Department has included other information typically included in a complete BACT determination for comparison purposes.

#### **6.4.1 Nitrogen Oxides Formation**

Much of the discussion in this section is based on a 1993 EPA document on Alternative Control Techniques for NO<sub>x</sub> Emissions from Stationary Gas Turbines. Project-specific information is included where applicable.

Nitrogen oxides form in the gas turbine combustion process as a result of the dissociation of molecular nitrogen and oxygen to their atomic forms and subsequent recombination into seven different oxides of nitrogen. Thermal NO<sub>x</sub> forms in the high temperature area of the gas turbine combustor. Thermal NO<sub>x</sub> increases exponentially with increases in flame temperature and linearly with increases in residence time. Flame temperature is dependent upon the ratio of fuel burned in a flame to the amount of fuel that consumes all of the available oxygen.

By maintaining a low fuel ratio (lean combustion), the flame temperature will be lower, thus reducing the potential for NO<sub>x</sub> formation. Prompt NO<sub>x</sub> is formed in the proximity of the flame front as intermediate combustion products. The contribution of Prompt to overall NO<sub>x</sub> is relatively small in lean, near-stoichiometric combustors and increases for leaner fuel mixtures. This provides a practical limit for NO<sub>x</sub> control by lean combustion.

Fuel NO<sub>x</sub> is formed when fuels containing bound nitrogen are burned. This phenomenon is not important when combusting natural gas.

Uncontrolled emissions range from about 100 to over 600 parts per million by volume, dry, corrected to 15 percent oxygen (ppm @15% O<sub>2</sub>). For large modern turbines, the Department estimates uncontrolled emissions at approximately 200 ppm @15% O<sub>2</sub>.

#### **6.4.2 NO<sub>x</sub> Control Techniques**

##### Combustion Controls

The excess air in lean combustion, cools the flame and reduces the rate of thermal NO<sub>x</sub> formation. Lean premixing of fuel and air prior to combustion can further reduce NO<sub>x</sub> emissions. This is accomplished by minimizing localized fuel-rich pockets (and high temperatures) that can occur when trying to achieve lean mixing within the combustion zones.



## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

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The above principle is depicted in Figure 5 for a General Electric can-annular combustor operating on gas. For ignition, warm-up, and acceleration to approximately 20 percent load, the first stage serves as the complete combustor. Flame is present only in the first stage, which is operated as lean stable combustion will permit. With increasing load, fuel is introduced into the secondary stage, and combustion takes place in both stages. When the load reaches approximately 40 percent, fuel is cut off to the first stage and the flame in this stage is extinguished. The venturi ensures the flame in the second stage cannot propagate upstream to the first stage. When the fuel in the first-stage flame is extinguished (as verified by internal flame detectors), fuel is again introduced into the first stage, which becomes a premixing zone to deliver a lean, unburned, uniform mixture to the second stage. The second stage acts as the complete combustor in this configuration.

To further reduce  $\text{NO}_x$  emissions, GE developed the DLN-2 combustor (cross section shown in Figure 5) wherein air usage (other than for premixing) was minimized. The venturi and the centerbody assembly were eliminated and the combustor has a single burning zone. So-called "quaternary fuel" is introduced through pegs located on the circumference of the outward combustion casing.

The emission characteristics of General Electric's DLN 2 combustors are given in Figure 6 (gas) and 7 (fuel oil).  $\text{NO}_x$  concentrations are higher in the exhaust at lower loads because at lower loads, the combustor do not operate in the lean pre-mix mode. Therefore such a combustor emits  $\text{NO}_x$  at concentrations of 25 parts per million (ppm) at loads between 50 and 100 percent of capacity, but concentrations as high as 100 ppm at less than 50 percent of capacity.

Simplified cross sectional views of the totally premixed DLN-2.6 combustor to be installed at the JEA project are shown in Figure 8. The combustor is similar to the DLN-2 with the addition of a sixth (center) fuel nozzle to achieve emissions as low as 9 ppm of  $\text{NO}_x$  and 9 ppm of CO. The expected emission characteristics of General Electric's DLN 2.6 combustors, tuned for the proposed project, are given in Figure 9 (gas). Emissions characteristics while firing oil are expected to be the same as shown for the DLN-2 in Figure 7. Note that VOC comprises a very small amount of the "unburned hydrocarbons" which in turn are mostly non-VOC methane.

In all but the most recent gas turbine combustor designs, the high temperature combustion gases are cooled to an acceptable temperature with dilution air prior to entering the turbine (expansion) section. The sooner this cooling occurs, the lower the thermal  $\text{NO}_x$  formation. Cooling is also required to protect the first stage nozzle. When this is accomplished by air cooling, the air is injected into the component and is ejected into the combustion gas stream, causing a further drop in combustion gas temperature. This, in turn, results in a lower achievable thermal efficiency for the unit.

Larger units, such as the Westinghouse 501 G or the planned General Electric 7H, use steam in a closed loop system to provide much of the cooling. The fluid is circulated through the internal portion of the nozzle component or around the transition piece between the combustor and the nozzle and does not enter the exhaust stream. Instead it is normally sent

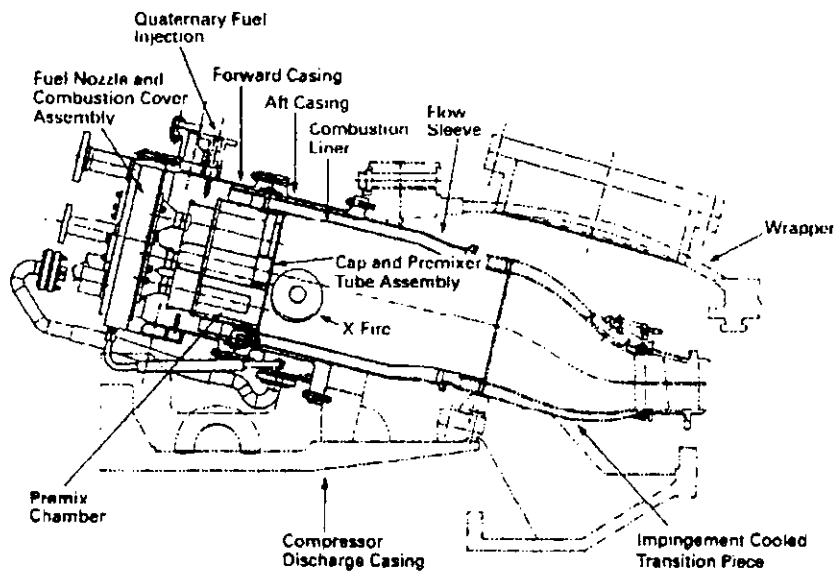
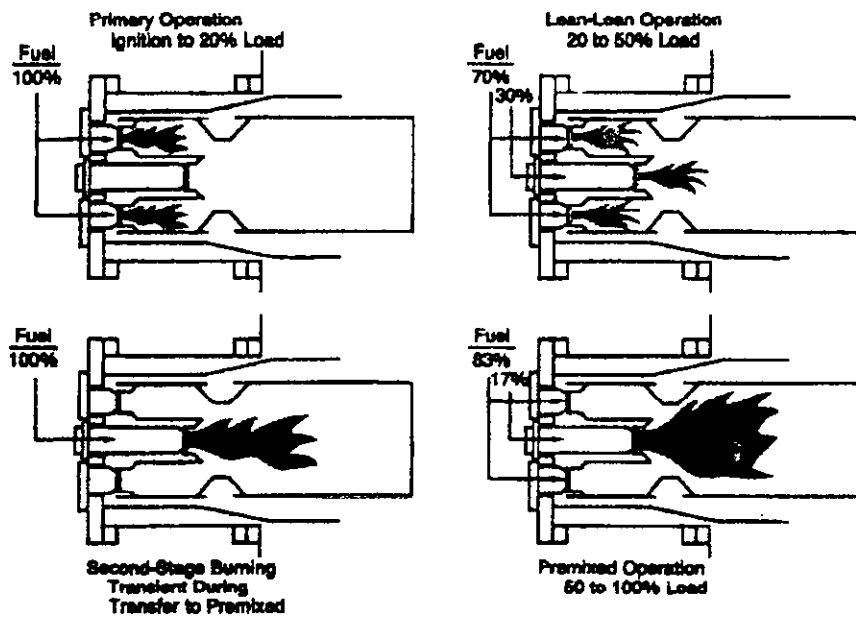


Figure 5 - Dry Low NOx Operating Modes - DLN-1

Cross Section of DLN-2.0

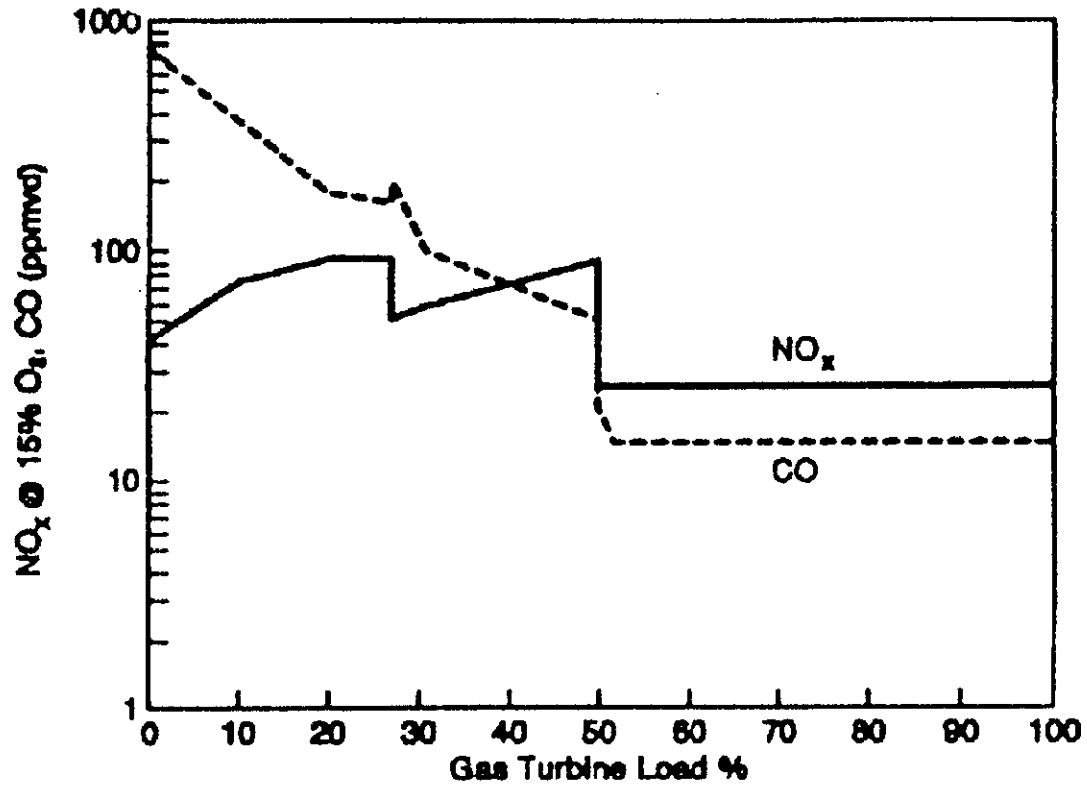


Figure 6 - Emissions Performance Curves for GE DLN-2 Combustor  
 Firing Natural Gas in a Dual Fuel GE 7FA Combustion Turbine

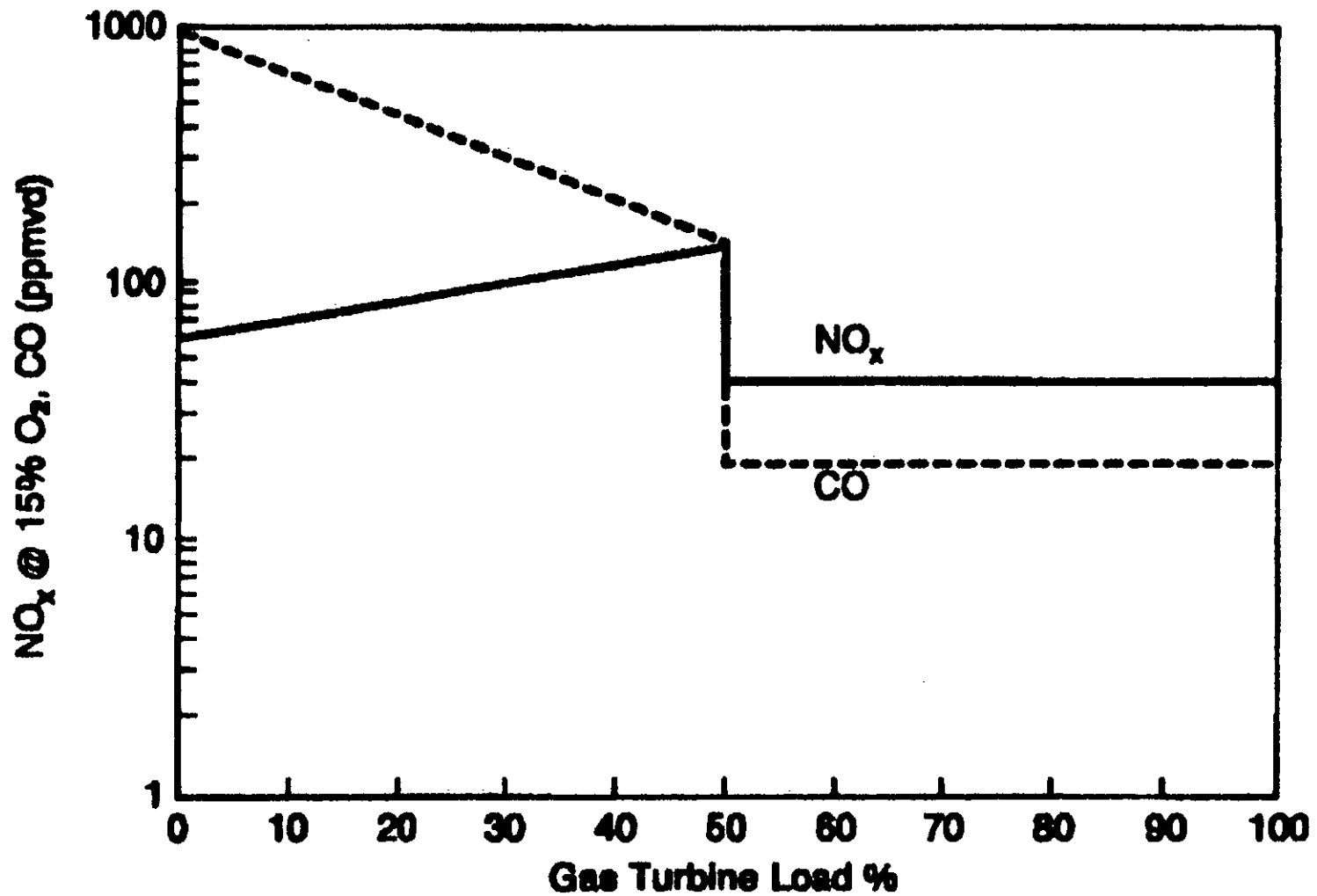


Figure 7 - Emissions Performance Curves for GE DLN-2 Combustor  
Firing Fuel Oil in Dual Fuel GE 7FA Turbine

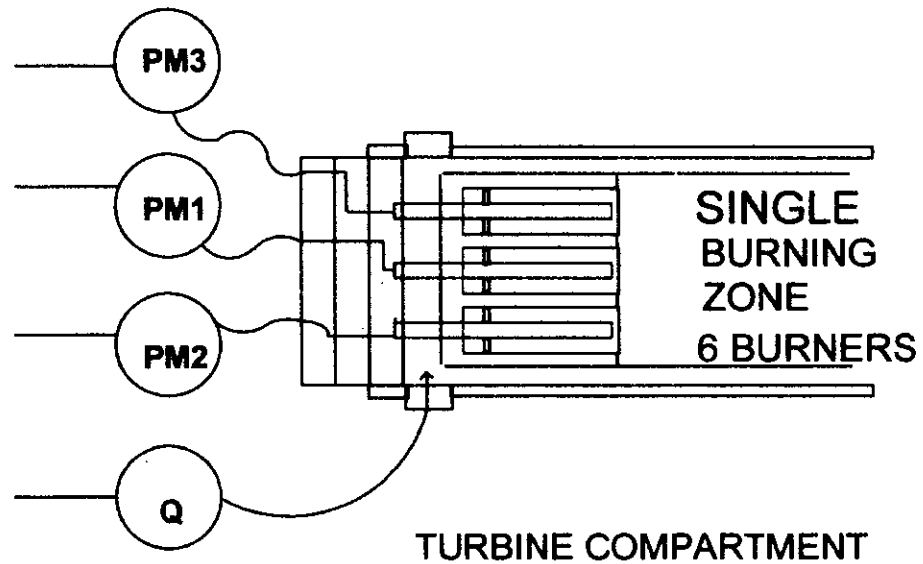
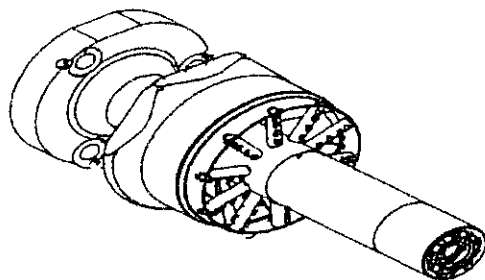
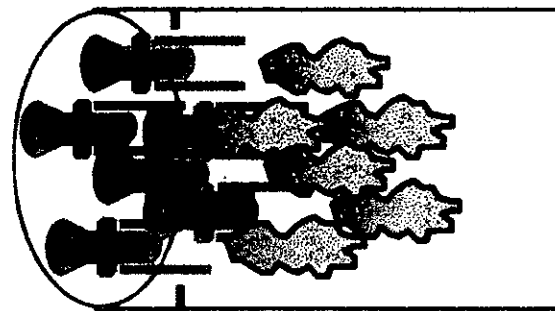
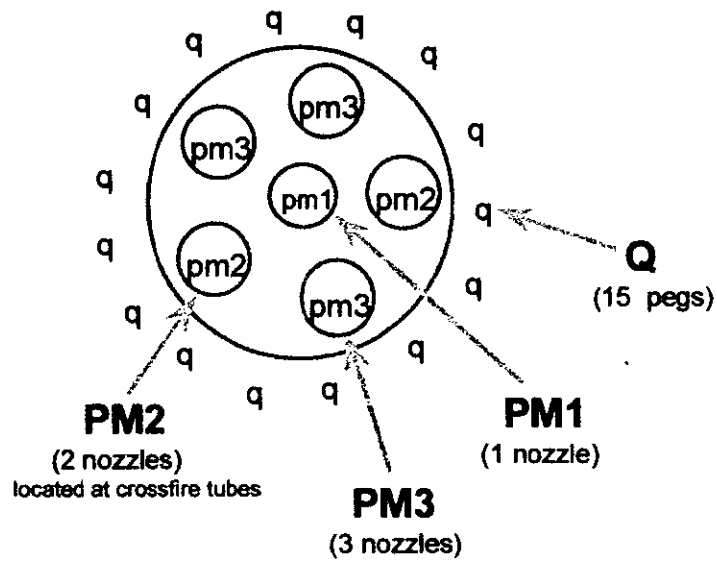
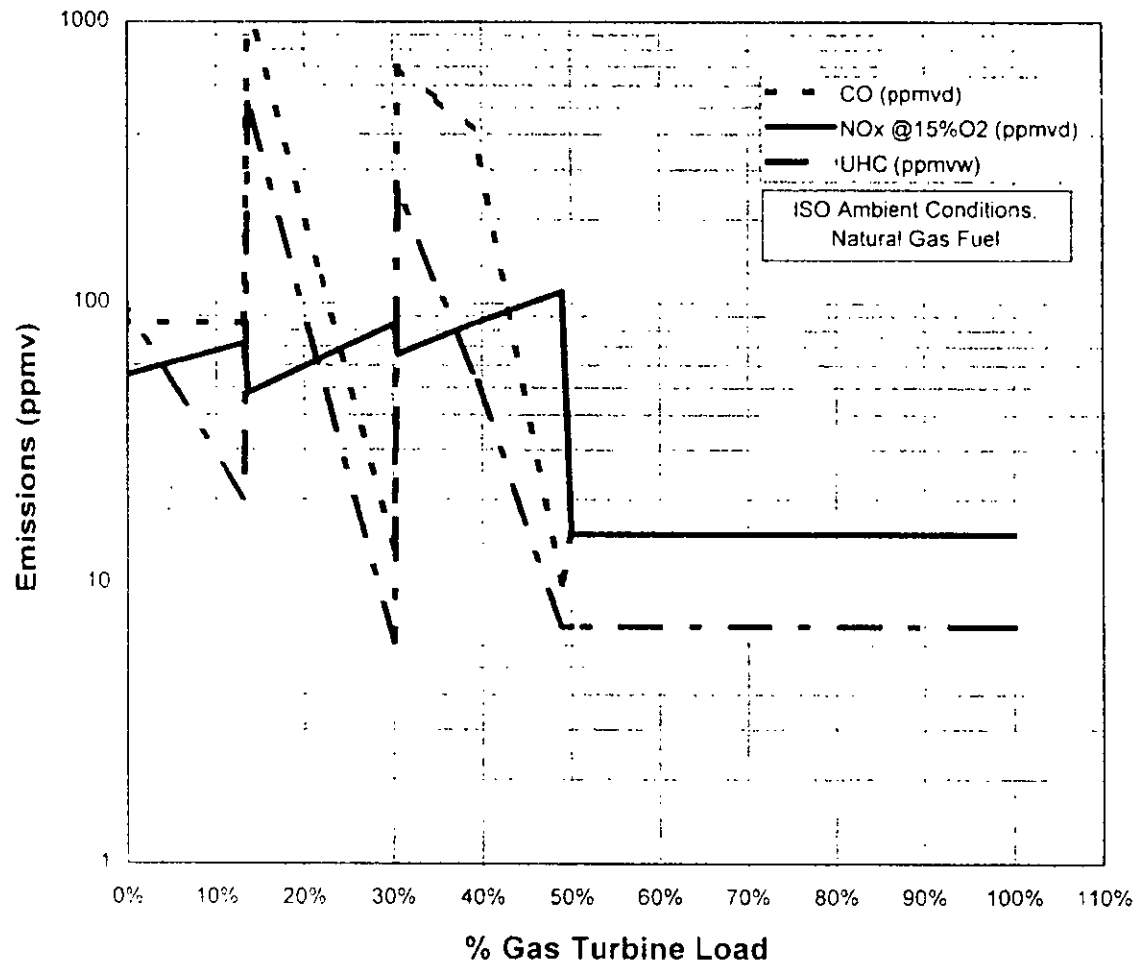


Figure 8 - GE DLN-2.6 Combustor and Nozzle Arrangement



**Figure 9 - Emissions Performance Curves for GE DLN-2.6 Combustor  
Firing Natural Gas in a Dual Fuel GE 7FA Combustion Turbine**

(Simple Cycle, Intermittent Duty - If Tuned to 15 ppm NOx)

## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

back to the steam generator. The difference between flame temperature and firing temperature into the first stage is minimized and higher efficiency is attained.

Another important result of steam cooling is that a higher firing temperature can be attained with no increase in flame temperature. Flame temperatures and NO<sub>x</sub> emissions can therefore be maintained at comparatively low levels even at high firing temperatures. At the same time, thermal efficiency should be greater when employing steam cooling. A similar analysis applies to steam cooling around the transition piece between the combustor and first stage nozzle.

The relationship between flame temperature, firing temperature, unit efficiency, and NO<sub>x</sub> formation can be appreciated from Figure 10 which is from a General Electric discussion on these principles. In addition to employing pre-mixing and steam cooling, further reductions are accomplished through design optimization of the burners, testing, further evaluation, etc.

At the present time, emissions achieved by combustion controls are low as 9 ppm (and even lower) from gas turbines smaller than about 200 MW (simple cycle), such as the F class.

### Selective Catalytic Combustion

Selective catalytic reduction (SCR) is an add-on NO<sub>x</sub> control technology that is employed in the exhaust stream following the gas turbine. SCR reduces NO<sub>x</sub> emissions by injecting ammonia into the flue gas. As of early 1992, over 100 gas turbine installations already used SCR in the United States. The only combustion turbines in Florida employing SCR are at the FPC Hines Energy Complex, where Westinghouse is unable to meet the DLN limits at the present time. Recently, FPC proposed a second construction phase incorporating SCR in two Westinghouse 501F combustion turbines. Seminole Electric recently advised the Department that it would install SCR in a previously Westinghouse 501F project, originally based on DLN. Virtually all SCR units are used in combination with wet injection or combustion controls.

Ammonia reacts with NO<sub>x</sub> in the presence of a catalyst and excess oxygen yielding molecular nitrogen and water. The catalyst used in combined cycle, low temperature applications (conventional SCR), is usually vanadium or titanium oxide and accounts for almost all installations. For high temperature applications (Hot SCR up to 1100 °F), such as simple cycle turbines, zeolite catalysts are available but used in few applications to-date.

In the past, sulfur was found to poison the catalyst material. Sulfur-resistant catalyst materials are now available, however, and catalyst formulation improvements have proven effective in resisting performance degradation with fuel oil in Europe and Japan, where conventional SCR catalyst life in excess of 4 to 6 years has been achieved, versus 8 to 10 years with natural gas.

In a manner analogous to balancing control of NO<sub>x</sub> from the combustor with emissions of CO and hydrocarbon, similar balancing is required when controlling NO<sub>x</sub> by SCR. Excessive ammonia use tends to increase emissions of CO, ammonia (slip), and particulate matter (when sulfur bearing fuels are used). Permit BACT limits as low as 3.5 ppm NO<sub>x</sub> have been specified using SCR for a combined cycle F Class project in Alabama and proposed for another F Class project in Mississippi.

## Gas Turbine - Hot Gas Path Parts

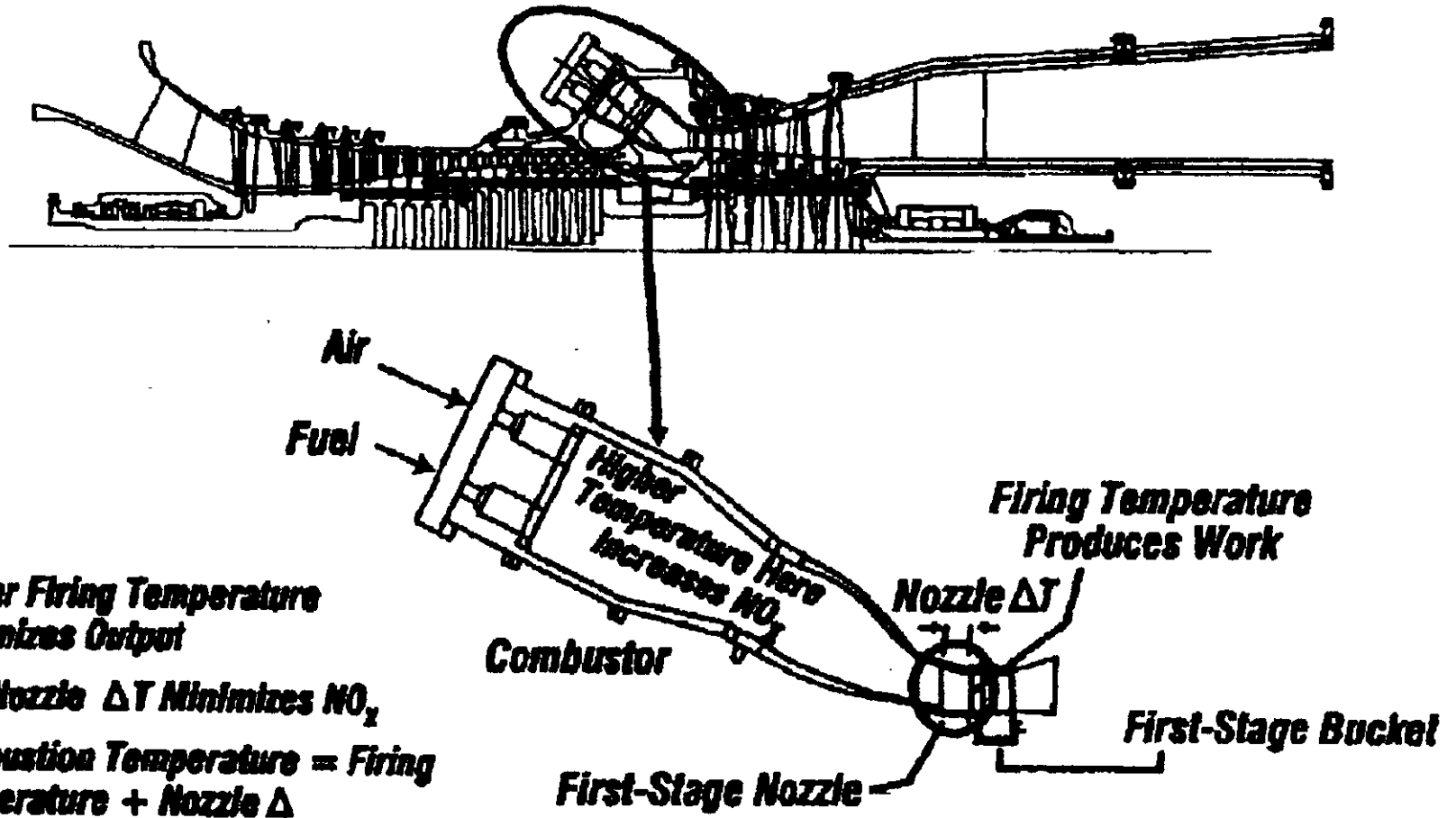


Figure 10 - Relation Between Flame Temperature and firing Temperature



## **TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION**

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

Particulate matter is generated by various physical and chemical processes during combustion and will be affected by the design and operation of the NO<sub>x</sub> controls. Particulate matter emitted from this unit will mainly be less than 10 microns in diameter (PM<sub>10</sub>).

Natural gas and maximum 0.05 percent sulfur No. 2 fuel oil will be the only fuels fired and are efficiently combusted in gas turbines. Clean fuels are necessary to avoid damaging turbine blades and other components already exposed to very high temperature and pressure. Natural gas is an inherently clean fuel and contains no ash. The fuel oil to be used contains minimal ash.

A technology review indicated that the top control option for PM<sub>10</sub> is a combination of good combustion practices, fuel quality, and filtration of inlet air. This has been chosen as BACT by the applicant and the Department concurs. Annual emissions of PM/PM<sub>10</sub> are expected to be less than 20 tons per year.

### **6.4.4 Carbon Monoxide (CO) Control**

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

Most installations using catalytic oxidation are located in the Northeast. Among them are the 272 MW Berkshire, Massachusetts facility, 240 MW Brooklyn Navalyard Facility, the 240 MW Masspower facility, the 165 MW Pittsfield Generating Plant in Massachusetts, and the 345 MW Selkirk Generating Plant in New York. Catalytic oxidation was recently installed at a cogeneration plant at Reedy Creek (Walt Disney World), Florida to avoid PSD review which would have been required due to increased operation at low load. Along with its recent proposal to install SCR on a Westinghouse 501F unit (Hardee Unit 3), Seminole Electric proposes to install an oxidation catalyst for CO control.

Most combustion turbines incorporate good combustion to minimize emissions of CO. These installations typically achieve CO emissions between 10 and 30 ppm at full load, even as they achieve relatively low NO<sub>x</sub> emissions by SCR or dry low NO<sub>x</sub> means. By comparison, the value of 15 ppm proposed JEA's application for gas firing appears relatively low, but consistent with the capabilities of the DLN-2.6 technology as discussed above. A CO limit of 20 ppm is proposed when burning oil. Annual emissions are expected not to exceed 97 ton per year.

### **6.4.5 Volatile Organic Compound (VOC) Control**

Volatile organic compound (VOC) emissions, like CO emissions, are formed due to incomplete combustion of fuel. There are no viable add-on control techniques as the combustion turbine itself is very efficient at destroying VOC. The applicant has proposed good combustion practices to control VOC to 1.4 ppm (gas) and 3.5 (oil). These values are as low as any BACT-based VOC limit previously set by the Department. According to GE, even lower VOC emissions were achieved during recent tests of the DLN-2.6 technology when firing natural gas.<sup>2</sup> Annual emissions of VOC are not expected to exceed 6 TPY.

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

## 6.5 Background on Selected Gas Turbine

JEA plans to install a nominal 170 MW General Electric MS7241FA combustion turbine to be operated in a simple cycle mode.

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

The first GE 7F/FA project in Florida was at the FPL Martin Plant in 1993 and entered commercial service in 1994.<sup>3</sup> The units were equipped with DLN-2 combustors with a permitted NO<sub>x</sub> limit of 25 ppm. These actually achieve less than 25 ppm of NO<sub>x</sub> and 15 ppm of CO. The City of Tallahassee recently received approval to install a GE 7FA Class unit at its Purdom Plant.<sup>4</sup> Although permitted emissions are 12 ppm of NO<sub>x</sub>, the City obtained a performance guarantee from GE of 9 ppm.<sup>5</sup>

General Electric, other manufacturers, and their customers are relying on further advancement and refinement of DLN technology to provide sufficient NO<sub>x</sub> control for their combined cycle turbines in Florida. Where required by BACT determinations of certain states, General Electric incorporates SCR in combined cycle projects.<sup>6</sup>

The approach of progressively refining such technology is a proven one, even on some relatively large units. Basically this was the strategy adopted in Florida throughout the 1990's. Recently GE Frame 7FA units met performance guarantees of 9 ppm with DLN-2.6 burners at Fort St. Vrain, CO and Clark County, WA.<sup>7</sup> GE has already achieved emissions of approximately 6 ppm on gas at a dual-fuel MW 7EA (120 MW combined cycle) unit at Cane Island Power Park in Kissimmee, FL.<sup>8</sup> The Cane Island unit is equipped with DLN-2 combustors. According to GE, similar performance is expected soon on the 7FA line and performance guarantees less than 9 ppm can be expected using the DLN-2.6 combustors for units delivered in a couple of years.<sup>9</sup>

## 6.6 Control Technology Determination

Following are the emission limits determined for the JEA project assuming full load. *Values for NO<sub>x</sub> are corrected to 15% O<sub>2</sub> on a dry basis.* These limits or their equivalents in terms of pounds per hour, are given in the permit Specific Conditions.

NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	PM/Visibility (% Opacity)	Technology and Comments
15 ppm (NG) 42 ppm (FO)	<2gr S/100scf of gas 0.05% S in FO	15 ppm (NG) 20 ppm (FO)	1.4 ppm (NG) 3.5 ppm (FO)	10	Dry Low NO <sub>x</sub> Combustors Wet Injection Pipeline Natural Gas Good Combustion Fuel Oil, 0.05% Sulfur

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

## 6.7 Rationale for Control Technology Determination

- JEA obtained a guarantee from GE for DLN-2.6 combustors which have been demonstrated to meet all of the above limits on "7FA" Class gas turbines.
- The JEA project "nets out" of PSD review and BACT.
- All of the combustion turbine emission limits comply with the NSPS and are close or equal to recent Department BACT determinations applicable to new units at start-up.
- PM<sub>10</sub> emissions will be very low and difficult to measure. Therefore, the Department, with JEA's concurrence, will set a visible emission standard of 10 percent opacity.
- The Department will set CO limits achievable by good combustion equal to 15 ppm on gas and 20 ppm on oil. CO limits for the FPL Fort Myers Repowering Project and the Santa Rosa Energy Center are 12 ppm on gas. Similar limits have been proposed in recently issued Intents for Kissimmee Utilities Cane Island Unit 3 and the Duke Energy New Smyrna Beach Power Project.
- VOC emissions of 1.4 ppm (gas) and 3.5 (oil) proposed by JEA are at the lower end of values determined as BACT. Good Combustion is sufficient to achieve these low levels with the DLN-2.6 combustors while firing natural gas.
- SO<sub>2</sub> and H<sub>2</sub>SO<sub>4</sub> Acid Mist emissions compliance will be implemented through the Custom Fuel Monitoring Schedule for each allowed fuel.

## 6.8 Compliance Procedures

Pollutant	Compliance Procedure
Visible Emissions	Method 9
Volatile Organic Compounds	Method 18, 25, or 25A (initial tests only)
Carbon Monoxide	Annual Method 10 (can use RATA if at capacity)
NO <sub>x</sub> (24-hr average)	NO <sub>x</sub> CEMS, O <sub>2</sub> or CO <sub>2</sub> diluent monitor, and flow device as needed
NO <sub>x</sub> (NSPS initial performance)	Method 20 (can use RATA if at capacity)

## 7. SOURCE IMPACT ANALYSIS

An air quality analysis was not required because the modification is not subject to PSD review.

## 8. CONCLUSION

Based on the foregoing technical evaluation of the application and other available information, the Department has made a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations.

*A. A. Linero, P.E.*

*Teresa Heron, Review Engineer*

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

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## REFERENCES

- <sup>1</sup> EPA. "Alternative Control Techniques for NO<sub>x</sub> Emissions from Stationary Gas Turbines." 1993.
- <sup>2</sup> Telecon. Vandervort, C., GE, and Linero, A. A., DEP. VOC Emissions From FA Gas Turbines with DLN-2.6 Combustors.
- <sup>3</sup> Brochure. General Electric. "GE Gas Turbines - MS7001FA." Circa 1993.
- <sup>4</sup> Davis, L.B. "Dry Low NO<sub>x</sub> Combustion Systems for GE Heavy Duty Gas Turbines. 1994.
- <sup>5</sup> Florida DEP. PSD Permit, City of Tallahassee Purdom Unit 8. May, 1998.
- <sup>6</sup> City of Tallahassee. PSD/Site Certification Application. April, 1997.
- <sup>7</sup> State of Alabama. PSD Permit, Alabama Power/Barry (GE 7FA).
- <sup>8</sup> Telecon. Schorr, M., GE, and Costello, M., Florida DEP. March 31, 1998. Status of DLN-2.6 Program.
- <sup>9</sup> Florida DEP. Bureau of Air Regulation Monthly Report. June, 1998.
- <sup>10</sup> Telecon. Schorr, M., GE, and Linero, A. A., Florida DEP. August, 1998. Cost effectiveness of DLN versus SCR.

**PERMITTEE:**

Jacksonville Electric Authority  
Kennedy Generating Station  
21 West Church Street  
Jacksonville, Florida 32202-3139

Permit No.	0310047-002-AC
Project:	170 MW Simple Cycle Peaking Unit
SIC No.	4911
Expires:	December 31, 2002

*Authorized Representative:*

Walter P. Bussels  
Managing Director & Chief Executive Officer

**PROJECT AND LOCATION:**

Jacksonville Electric Authority (JEA) proposes to install one (1) natural gas/fuel-fired simple cycle unit that will consist of a nominal 170 MW (at 59°F) combustion turbine-generator equipped with Dry Low NO<sub>x</sub> (DLN-2.6) combustors. The CT proposed is a General Electric PG-7241-FA and will be used as a peaking unit. This turbine will replace one existing natural gas/fuel oil-fired boiler identified by JEA as KE10 (ARMS Emission Unit 009) at the Kennedy Generating Station in Duval County. The project also includes a 90-foot new stack.

This facility is located at 4215 Talleyrand Ave in Jacksonville, Duval County, Florida. UTM coordinates are: Zone 17; 440.0 km E and 3,591,00 km N.

**STATEMENT OF BASIS:**

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

**ATTACHED APPENDICES MADE A PART OF THIS PERMIT:**

Appendix GC                      Construction Permit General Conditions

\_\_\_\_\_  
Howard L. Rhodes, Director  
Division of Air Resources  
Management

# AIR CONSTRUCTION PERMIT 0310047-002-AC

## SECTION I. FACILITY INFORMATION

### FACILITY DESCRIPTION

Currently, this facility generates electric power from a 134 MW and two 44 MW natural gas/fuel oil-fired steam units, an auxiliary 21 MW boiler, and three oil fired 56.2 MW combustion turbines used as peaking units, all with a combined generating capacity of approximately 412 MW.

This permitting action is to install one (1) natural gas/fuel-fired simple cycle unit that will consist of a nominal 170 MW (at 59 °F) combustion turbine-generator equipped with Dry Low NO<sub>x</sub> (DLN-2.6) combustors. The CT proposed is a General Electric PG 7241 FA and will be used as a peaking unit. This turbine will replace one existing natural gas/fuel oil-fired boiler identified by JEA as KE10 (ARMS Emission Unit 009) at the Kennedy Generating Station in Duval County. The project also includes a 90-foot new stack.

This Project is exempt from the requirements of Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD) as discussed stated in the Technical Evaluation and Preliminary Determination dated January 29, 1999.

### EMISSION UNITS

This permit addresses the following emission unit:

Emission Unit No.	System	Emission Unit Description
00X	Power Generation	One 170 MW Simple Cycle Combustion Turbine-Generator - Peaking Unit

### REGULATORY CLASSIFICATION

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

This facility is within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 100 TPY for at least one criteria pollutant, the facility is also a Major Facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD).

This facility is a major source of hazardous air pollutants (HAPs) and is also subject to the provisions of Title IV, Acid Rain, Clean Air Act as amended in 1990 (Title V application received June 14, 1996).

# AIR CONSTRUCTION PERMIT 0310047-002-AC

## SECTION I. FACILITY INFORMATION

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### PERMIT SCHEDULE

- xx/xx/99 Notice of Intent published in \_\_\_\_\_
- 01/29/99 Distributed Intent to Issue Permit
- 12/23/98 Application deemed complete
- 10/30/98 Received Application

### RELEVANT DOCUMENTS:

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

- Application received on October 30, 1998.
- Department's Intent to Issue and Public Notice Package dated January 29, 1999.
- EPA comments dated February xx, 1999.
- JEA's comments dated December 23, 1998, January 19 and February XX, 1999.

# AIR CONSTRUCTION PERMIT 0310047-002-AC

## SECTION II. EMISSION UNIT(S) ADMINISTRATIVE REQUIREMENTS

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1. Regulating Agencies: All documents related to applications for permits to construct, operate or modify an emissions unit should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (DEP), at 2600 Blairstone Road, Tallahassee, Florida 32399-2400 and phone number (850)488-0114. All documents related to reports, tests, and notifications should be submitted to the Jacksonville Regulatory & Environmental Services Department (RESD) Air & Water Quality Division, Suite 225, 117 W. Duval Street, Jacksonville, Florida 32202 and phone number 904/630-3484; and a copy to the DEP Northeast District offices, 7825 Baymeadows Way, Suite 200B Jacksonville, Florida 32256-7590 and phone number 904/448-4300.
2. General Conditions: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in Appendix GC of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]
3. Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.
4. Forms and Application Procedures: The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. [Rule 62-210.900, F.A.C.]
5. Modifications: The permittee shall give written notification to the Department when there is any modification to this facility. This notice shall be submitted sufficiently in advance of any critical date involved to allow sufficient time for review, discussion, and revision of plans, if necessary. Such notice shall include, but not be limited to, information describing the precise nature of the change; modifications to any emission control system; production capacity of the facility before and after the change; and the anticipated completion date of the change. [Chapters 62-210 and 62-212]
6. Permit Extension: *This permit expires on December 31, 2002.* The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit. [Rule 62-4.080, F.A.C.].
7. Application for Title IV Permit: An application for a Title IV Acid Rain Permit, must be submitted to the U.S. Environmental Protection Agency Region IV office in Atlanta, Georgia and a copy to the DEP's Bureau of Air Regulation in Tallahassee 24 months before the date on which the new unit begins serving an electrical generator (greater than 25 MW). [40 CFR 72]
8. Application for Title V Permit: An application for a Title V operating permit, pursuant to Chapter 62-213, F.A.C., must be submitted to the DEP's Bureau of Air Regulation, and a copy sent to the Department's Northeast District and the Jacksonville Regulatory & Environmental Protection Commission offices. [Chapter 62-213, F.A.C.]



## AIR CONSTRUCTION PERMIT 0310047-002-AC

### SECTION II. EMISSION UNIT(S) ADMINISTRATIVE REQUIREMENTS

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9. New or Additional Conditions: Pursuant to Rule 62-4.080, F.A.C., for good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]
10. Annual Reports: Pursuant to Rule 62-210.370(2), F.A.C., Annual Operation Reports, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. Annual operating reports shall be sent to the DEP's Northeast District and Jacksonville RESD's Air & Water Quality Division offices by March 1st of each year.
11. Stack Testing Facilities: Stack sampling facilities shall be installed in accordance with Rule 62-297.310(6), F.A.C.
12. Quarterly Reports: Quarterly excess emission reports, in accordance with 40 CFR 60.7 (a)(7) (c) (1997 version), shall be submitted to the DEP's Northeast District and Jacksonville RESD's Air & Water Quality Division offices.

# AIR CONSTRUCTION PERMIT 0310047-002-AC

## SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

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### APPLICABLE STANDARDS AND REGULATIONS:

1. Unless otherwise indicated in this permit, the construction and operation of the subject emission unit shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S. and Florida Administrative Code Chapters 62-4, 62-110, 62-204, 62-210, 62-212, 62-213, 62-214, 62-296, and 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Parts 60, 72, 73, and 75.
2. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. [Rule 62-210.300, F.A.C.]
3. These emission units shall comply with all applicable requirements of 40CFR60, Subpart A, General Provisions including:
  - 40CFR60.7, Notification and Recordkeeping
  - 40CFR60.8, Performance Tests
  - 40CFR60.11, Compliance with Standards and Maintenance Requirements
  - 40CFR60.12, Circumvention
  - 40CFR60.13, Monitoring Requirements
  - 40CFR60.19, General Notification and Reporting requirements
4. ARMS Emission Unit 0XX, Power Generation, consisting of one (nominal) 170 MW combustion turbines (simple cycle peaking operation), shall comply with all applicable provisions of 40CFR60, Subpart GG, Standards of Performance for Stationary Gas Turbines, adopted by reference in Rule 62-204.800(7)(b), F.A.C. The Subpart GG requirement to correct test data to ISO conditions applies. However, such correction is not required to demonstrate compliance with non-NSPS permit standard(s).
5. All notifications and reports required by the above specific conditions shall be submitted to the DEP's Northeast District and Jacksonville RESD's Air & Water Quality Division offices.

### GENERAL OPERATION REQUIREMENTS

6. Fuels: Only pipeline natural gas or maximum 0.05 percent sulfur fuel oil No. 2 or superior grade of distillate fuel oil shall be fired in this unit. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]
7. Turbine Capacity: The maximum heat input rates to this combustion turbine based on the lower heating value (LHV) of the fuel at ambient conditions of 59° F, 60% relative humidity, 100% load, and 14.7 psi pressure shall not exceed 1,623 million Btu per hour (MMBtu/hr) while firing gas and 1,822 million Btu per hour (MMBtu/hr) while firing fuel oil. This maximum heat input rate will vary depending upon turbine inlet conditions and the combustion turbine characteristics. Manufacturer's curves corrected for site conditions or equations for correction to other ambient conditions shall be provided to the Department of Environmental Protection (DEP) within 45 days of completing the initial compliance testing. [Design, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

## AIR CONSTRUCTION PERMIT 0310047-002-AC

### SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

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8. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary.
9. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the DEP Northeast District and Jacksonville RESD's Air & Water Quality Division offices as soon as possible, but at least within (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit and the regulations. [Rule 62-4.130, F.A.C.]
10. Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. [Rule 62-4.070(3), F.A.C.]
11. Circumvention: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C.]
12. Maximum allowable hours of operation in any twelve month period: (MAXHROP) for this peaking unit shall not exceed 4050 hours on gas or 1260 hours on fuel oil or the hours calculated pursuant to the following formula:  
$$\text{MAXHROP} = 4050 - 3.215 * \text{ACTHROPFO}$$

Where: ACTHROPFO = Actual hours of operation on fuel oil  
[Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

#### Control Technology

13. Dry Low NO<sub>x</sub> (DLN) combustor shall be installed on this stationary combustion turbine to control nitrogen oxides (NO<sub>x</sub>) emissions. [Design, Rule 62-4.070, F.A.C.]
14. The permittee shall provide manufacturer's emissions performance versus load diagrams for the DLN systems prior to their installation. DLN systems shall each be tuned upon initial operation to optimize emissions reductions and shall be maintained to minimize NO<sub>x</sub> emissions and CO emissions. [Rule 62-4.070, and 62-210.650 F.A.C.]
15. A water injection system shall be installed for use when firing No. 2 or superior grade distillate fuel oil for control of NO<sub>x</sub> emissions. [Design, Rules 62-4.070 and 62-212.400, F.A.C.]

# AIR CONSTRUCTION PERMIT 0310047-002-AC

## SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

### EMISSION LIMITS AND STANDARDS

16. Following are the emission limits determined for this project assuming full load. Values for NO<sub>x</sub> are at 15% O<sub>2</sub> on a dry basis. These limits or their equivalents in terms of pounds per hour, as well as the applicable averaging times, are followed by the applicable specific conditions. [Applicant Requests, Rules 62-204.800(7)(b) (Subparts GG ), 62-210.200 (Definitions-Potential Emissions), F.A.C.].

NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC	PM/Visibility (% Opacity)	Technology and Comments
15 ppm (NG) 42 ppm (FO)	<2gr/100scf (NG) 0.05% (FO)	15 ppm (NG) 20 ppm (FO)	1.4 ppm (NG) 3.5 ppm (FO)	10	Dry Low NO <sub>x</sub> Combustors Pipeline Natural Gas Good Combustion Fuel Oil, 0.05% Sulfur Content

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

- The concentration of NO<sub>x</sub> concentrations in the exhaust gas of this CT shall not exceed 15 ppm at 15% O<sub>2</sub> (on a 24-hr block average) as measured by the CEMS (maintained in accordance with 40 CFR 75) while burning natural gas. In addition, NO<sub>x</sub> emissions calculated as NO<sub>2</sub> (at ISO conditions) shall exceed neither 15 ppm at 15% O<sub>2</sub> nor 99 lb/hr to be demonstrated by stack test. Total annual NO<sub>x</sub> emissions shall not exceed 200 tons per year (gas/oil or gas or oil). [Rules 62-4.070 and 62-212.400, F.A.C. to avoid PSD Review]
- The concentration of NO<sub>x</sub> concentrations in the exhaust gas of this CT shall not exceed 42 ppm at 15% O<sub>2</sub> (on a 24-hr block average) as measured by the CEMS (maintained in accordance with 40 CFR 75) while burning fuel oil. In addition, NO<sub>x</sub> emissions calculated as NO<sub>2</sub> (at ISO conditions) shall exceed neither 42 ppm at 15% O<sub>2</sub> nor 318 lb/hr to be demonstrated by stack test. Total annual NO<sub>x</sub> emissions shall not exceed 200 tons per year (gas/oil or gas or oil). [Rules 62-4.070 and 62-212.400, F.A.C. to avoid PSD Review]
- When NO<sub>x</sub> monitoring data is not available, substitution for missing data shall be handled as required by Title IV (40 CFR 75) to calculate the specified average time.

18. Visible Emissions (VE): VE emissions shall not exceed 10 percent opacity.

19. Carbon Monoxide (CO) emissions: The concentration of CO in the exhaust gas shall not exceed 15 ppmvd (gas) and 20 ppmvd (oil) as measured by EPA Method 10. CO emissions (at ISO conditions) shall not exceed 48 lb/hr (gas) and 97 lb/hr (oil) to be demonstrated by stack test.

20. Volatile Organic Compounds (VOC) Emissions: The concentration of VOC in the exhaust gas shall not exceed 1.4 ppmvd (gas) and 3.5 ppm (oil) as determined by EPA Methods 18, 25 or 25 A. VOC emissions (at ISO conditions) shall not exceed 2.9 lb/hr (gas) and 19 lb/hr (oil).

# AIR CONSTRUCTION PERMIT 0310047-002-AC

## SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

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21. Sulfur Dioxide (SO<sub>2</sub>) emissions: SO<sub>2</sub> emissions (at ISO conditions) shall not exceed 9.7 pounds per hour when firing pipeline natural gas and 98 pounds per hour when firing maximum 0.05 percent sulfur No. 2 or superior grade distillate fuel oil. Initial tests shall be performed by applicable compliance methods described below. Compliance with this requirement in conjunction with implementation of the Custom Fuel Monitoring Schedules in Specific Conditions 41 and 42 will demonstrate compliance with the applicable NSPS SO<sub>2</sub> emissions limitations. Confirmation by the Custom Fuel Monitoring Schedule that the actual sulfur content is less than 2 grains per 100 standard cubic feet (gas) and 0.05 % sulfur content (fuel oil) will demonstrate compliance with the permit limits for SO<sub>2</sub>. Emissions of SO<sub>2</sub> shall not exceed 62 tons per year. [Rules 62-4.070 and 62-212.400, F.A.C. to avoid PSD Review]

### EXCESS EMISSIONS

22. Excess emissions resulting from startup, shutdown, or malfunction shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration. [Rule 62-210.700, F.A.C.].
23. Excess emissions entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited pursuant to Rule 62-210.700, F.A.C.
24. Excess Emissions Report: If excess emissions occur for more than two hours due to malfunction, the owner or operator shall notify DEP's Northeast District and Jacksonville RESD's Air & Water Quality Division offices within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Pursuant to the New Source Performance Standards, all excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. Following this format, 40 CFR 60.7, periods of startup, shutdown, malfunction, and fuel switching shall be monitored, recorded, and reported as excess emissions when emission levels exceed the permitted standards listed in Specific Condition No. 16 and 17. [Rules 62-4.130, 62-204.800, 62-210.700(6), F.A.C., and 40 CFR 60.7 (1997 version)].

### COMPLIANCE DETERMINATION

25. Compliance with the allowable emission limiting standards shall be determined within 60 days after achieving the maximum production rate at which each unit will be operated, but not later than 180 days following initial operation of the unit, and annually thereafter as indicated in this permit, by using the following reference methods as described in 40 CFR 60, Appendix A (1997 version), and adopted by reference in Chapter 62-204.800, F.A.C.

# AIR CONSTRUCTION PERMIT 0310047-002-AC

## SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

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26. Initial (I) performance stack tests shall be performed on this unit while firing natural gas and fuel oil. Annual (A) compliance tests shall be performed during every federal fiscal year (October 1 - September 30) pursuant to Rule 62-297.310(7), F.A.C., on these units as indicated. The following reference methods shall be used. No other test methods may be used for compliance testing unless prior DEP approval is received in writing.
- EPA Reference Method 9, "Visual Determination of the Opacity of Emissions from Stationary Sources" (I, A).
  - EPA Reference Method 10, "Determination of Carbon Monoxide Emissions from Stationary Sources" (I, A).
  - EPA Reference Method 20, "Determination of Oxides of Nitrogen Oxide, Sulfur Dioxide and Diluent Emissions from Stationary Gas Turbines." Initial test only for compliance with 40CFR60 Subpart GG.
  - EPA Reference Method 18 or 25 and/or 25A, "Determination of Volatile Organic Concentrations." Initial test only.
27. Continuous compliance with the NO<sub>x</sub> emission limits: Continuous compliance with the NO<sub>x</sub> emission limits shall be demonstrated with the CEM system based on the applicable averaging time of 24-hr block average. Based on CEMS data, a separate compliance determination is conducted at the end of each operating day and a new average emission rate is calculated from the arithmetic average of all valid hourly emission rates from the previous operating day. Valid hourly emission rates shall not include periods of start up, shutdown, or malfunction unless prohibited by 62-210.700 F.A.C. A valid hourly emission rate shall be calculated for each hour in which at least two NO<sub>x</sub> concentrations are obtained at least 15 minutes apart. These excess emissions periods shall be reported as required in Condition 24. [Rules 62-4.070 F.A.C., 62-210.700, F.A.C., and 40 CFR 75]
28. Compliance with the SO<sub>2</sub> and PM/PM<sub>10</sub> emission limits: Notwithstanding the requirements of Rule 62-297.340, F.A.C., the use of pipeline natural gas and maximum 0.05 percent sulfur (by weight) No. 2 or superior grade distillate fuel oil, is the method for determining compliance for SO<sub>2</sub> and PM<sub>10</sub>. For the purposes of demonstrating compliance with the 40 CFR 60.333 SO<sub>2</sub> standard and the 0.05% S limit, fuel oil analysis using ASTM D2880-71 or D4294 (or equivalent) for the sulfur content of liquid fuels and D1072-80, D3031-81, D4084-82 or D3246-81 (or equivalent) for sulfur content of gaseous fuel shall be utilized in accordance with the EPA-approved custom fuel monitoring schedule. The applicant is responsible for ensuring that the procedures above are used for determination of fuel sulfur content. Analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency pursuant to 40 CFR 60.335(e) (1997 version).

# AIR CONSTRUCTION PERMIT 0310047-002-AC

## SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

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29. Compliance with CO emission limit: An initial test for CO, shall be conducted concurrently with the initial NO<sub>x</sub> test, as required. The initial NO<sub>x</sub> and CO test results shall be the average of three valid one-hour runs. Annual compliance testing for CO may be conducted at less than capacity when compliance testing is conducted concurrent with the annual NO<sub>x</sub> RATA testing which is performed pursuant to 40 CFR 75.
30. Compliance with the VOC emission limit: An initial test is required to demonstrate compliance with the VOC emission limit. Thereafter, CO emission limit will be employed as a surrogate and no annual testing is required.
31. Testing procedures: Testing of emissions shall be conducted with the combustion turbine operating at permitted capacity. Permitted capacity is defined as 95-100 percent of the maximum heat input rate allowed by the permit, corrected for the average turbine inlet temperature during the test (with 100 percent represented by a curve depicting heat input vs. ambient temperature). If it is impracticable to test at permitted capacity, the source may be tested at less than permitted capacity. In this case, subsequent operation is limited by adjusting the entire heat input vs. turbine inlet temperature curve downward by an increment equal to the difference between the maximum permitted heat input (corrected for ambient temperature) and 105 percent of the value reached during the test until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity. Test procedures shall meet all applicable requirements (i.e., testing time frequency, minimum compliance duration, etc.) of Chapter 62-204.800 F.A.C.
32. Test Notification: The DEP's Northeast District and Jacksonville RESD's Air & Water Quality Division offices shall be notified, in writing, at least 30 days prior to the initial performance tests and at least 15 days before annual compliance test(s).
33. Special Compliance Tests: The DEP may request a special compliance test pursuant to Rule 62-297.310(7), F.A.C., when, after investigation (such as complaints, increased visible emissions, or questionable maintenance of control equipment), there is reason to believe that any applicable emission standard is being violated.
34. Test Results: Compliance test results shall be submitted to the DEP's Northeast District and Jacksonville RESD's Air & Water Quality Division offices no later than 45 days after completion of the last test run.

### NOTIFICATION, REPORTING, AND RECORDKEEPING

35. Records: All measurements, records, and other data required to be maintained by the permittee shall be recorded in a permanent form and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. These records shall be made available to DEP representatives upon request.

# AIR CONSTRUCTION PERMIT 0310047-002-AC

## SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

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36. Emission Compliance Stack Test Reports: A test report indicating the results of the required compliance tests shall be filed with the DEP Northeast District and Jacksonville RESD's Air & Water Quality Division Offices as soon as practical, but no later than 45 days after the last sampling run is completed. [Rule 62-297.310(8), F.A.C.]. The test report shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8), F.A.C.

### MONITORING REQUIREMENTS

37. Continuous Monitoring System: The permittee shall install, calibrate, maintain, and operate a continuous emission monitor in the stack to measure and record the nitrogen oxides emissions from this unit. Periods when NO<sub>x</sub> emissions (ppmvd at 15% oxygen) are above the standards, listed in Specific Condition No 16 and 17, shall be provided to the DEP Bureau of Air Monitoring and Mobile Sources pursuant to 40CFR75.
38. CEMS in lieu of Water to Fuel Ratio: Subject to EPA approval, the NO<sub>x</sub> CEMS shall be used in lieu of the water/fuel monitoring system for reporting excess emissions in accordance with 40 CFR 60.334(c)(1), Subpart GG (1997 version). Subject to EPA approval, the calibration of the water/fuel monitoring device required in 40 CFR 60.335 (c)(2) (1997 version) will be replaced by the 40 CFR 75 certification tests of the NO<sub>x</sub> CEMS. Upon request from DEP, the CEMS emission rates for NO<sub>x</sub> on this Unit shall be corrected to ISO conditions to demonstrate compliance with the NO<sub>x</sub> standard established in 40 CFR 60.332.
39. CEMS in lieu of the requirement for reporting excess emissions: Subject to EPA approval, the NO<sub>x</sub> CEMS shall be used in lieu of the requirement for reporting excess emissions in accordance with 40 CFR 60.334(c)(1), Subpart GG (1997 version). Upon request from DEP, the CEMS emission rates for NO<sub>x</sub> on this CT shall be corrected to ISO conditions to demonstrate compliance with the NO<sub>x</sub> standard established in 40 CFR 60.332.
40. Continuous Monitoring System Reports: The monitoring devices shall comply with the certification and quality assurance, and any other applicable requirements of Rule 62-297.520, F.A.C., 40 CFR 60.13, including certification of each device in accordance with 40 CFR 60, Appendix B, Performance Specifications and 40 CFR 60.7(a)(5) or 40 CFR Part 75. Quality assurance procedures must conform to all applicable sections of 40 CFR 60, Appendix F or 40CFR75. Data on CEM equipment specifications, manufacturer, type, calibration and maintenance needs, and its proposed location shall be provided to the Department's Northeast District and Jacksonville RESD's Air & Water Quality Division Offices for review at least 90 days prior to installation.
41. Natural Gas Monitoring Schedule: The following custom monitoring schedule for natural gas is approved in lieu of the daily sampling requirements of 40 CFR 60.334 (b)(2):



## AIR CONSTRUCTION PERMIT 0310047-002-AC

### SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

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- The permittee shall apply for an Acid Rain permit within the deadlines specified in 40 CFR 72.30.
- The permittee shall submit a monitoring plan, certified by signature of the Designated Representative (DR), that commits to using a primary fuel of pipeline supplied natural gas (sulfur content less than 20 gr/100 scf pursuant to 40 CFR 75.11(d)(2)).
- This unit shall be monitored for SO<sub>2</sub> emissions using methods consistent with the requirements of 40 CFR 75.11 and certified by the USEPA.

This custom fuel monitoring schedule will only be valid when pipeline natural gas is used as a primary fuel. If the primary fuel for this unit is changed to a higher sulfur fuel, SO<sub>2</sub> emissions must be accounted for as required pursuant to 40 CFR 75.11(d).

42. Fuel Oil Monitoring Schedule: 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 Kennedy Center Station, an analysis which reports the sulfur content and nitrogen 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).

43. Determination of Process Variables:

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

# Memorandum

# Florida Department of Environmental Protection

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TO: ~~C. H. Fancy~~

THRU: Al Linero *aa Linero* 1/26

FROM: Teresa Heron *TH*

DATE: January 26, 1999

SUBJECT: JEA Kennedy Generating Station 170 MW Combustion Turbine  
DEP File No. 0310047-002-AC

Attached is the draft public notice package including the Intent to Issue and the Technical Evaluation and Preliminary Determination for the Project. The application is for installation of a nominal 170 megawatt (MW) natural gas and No. 2 fuel oil-fired combustion turbine-electrical generator. The new unit will operate in simple cycle and intermittent duty. Hours of operation will be limited to 4050 hours on natural gas or 1260 hours on fuel oil. It will replace a conventional natural gas and fuel oil-fired conventional steam generator at the Kennedy Generating Station..

The project netted out of PSD and no BACT was required. Nitrogen Oxides (NO<sub>x</sub>) emissions will be controlled by Dry Low NO<sub>x</sub> (DLN-2.6) combustors tuned to achieve 15 parts per million (ppm) by volume at 15 percent oxygen. NO<sub>x</sub> emissions will be 42 ppm while firing No. 2 fuel oil. Emissions of carbon monoxide (CO) will be controlled to 15 ppm (gas) 20 ppm (oil), while emissions of volatile organic compounds (VOC) will be less than 1.4 ppm (gas) and 3.5ppm (oil). Emissions of sulfur dioxide (SO<sub>2</sub>), sulfuric acid mist (SAM), and particulate matter (PM/PM<sub>10</sub>) will be low due to use of clean fuels and the limited hours of operation.

We recommend your approval.

AAL/th

Attachments



Jeb Bush  
Governor

# Department of Environmental Protection

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

David B. Struhs  
Secretary

## P.E. Certification Statement

**Permittee:**

**DEP File No. 0310047-002-AC**

Jacksonville Electric Company  
Kennedy Generating Station  
Duval County

**Project type:**

Project to install a nominal 170 megawatt (MW) natural gas and No. 2 fuel-oil-fired combustion turbine-electrical generator to replace a conventional steam electric generating unit. Project includes a 90 foot stack. Service will be intermittent duty.

Nitrogen Oxides emissions will be controlled by Dry Low NO<sub>x</sub> (DLN-2.6) combustors tuned to achieve 15 parts per million (ppm) by volume at 15 percent oxygen. When firing fuel oil, emissions of NO<sub>x</sub> will be controlled by wet injection to 42 ppm. Emissions of carbon monoxide will be controlled to 15 ppm, while emissions of volatile organic compounds will be less than 1.4 ppm. Emissions of sulfur dioxide, sulfuric acid mist, and particulate matter will be low because of the use of inherently clean pipeline quality natural gas and maximum 0.05 percent sulfur fuel oil. The project "nets out" of PSD and a BACT determination was not required.

*I HEREBY CERTIFY that the engineering features described in the above referenced application and subject to the proposed permit conditions provide reasonable assurance of compliance with applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4 and 62-204 through 62-297. However, I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including but not limited to the electrical, mechanical, structural, hydrological, and geological features).*

*1/29/99*

A. A. Linero, P.E.

Date

Registration Number: 26032

Bureau of Air Regulation  
New Source Review Section  
111 South Magnolia Drive, Suite 4  
Tallahassee, Florida 32301  
Phone (850) 921-9523  
Fax (850) 922-6979

*adj*

*1/29*

Is your RETURN ADDRESS completed on the reverse side?

**SENDER:**

- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

- 1.  Addressee's Address
- 2.  Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:  
 Walter P. Bussels  
 JEA  
 Kennedy Generating S  
 21 West Church St.  
 Jacksonville, FL 32202-3139

4a. Article Number  
Z 333 612 505

4b. Service Type  
 Registered  Certified  
 Express Mail  Insured  
 Return Receipt for Merchandise  COD

7. Date of Delivery  
2-2-99

5. Received By: (Print Name)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature: (Addressee or Agent)  
 X *[Signature]*

PS Form 3811, December 1994

102595-97-8-0179

Domestic Return Receipt

Thank you for using Return Receipt Service.

Z 333 612 505

US Postal Service  
**Receipt for Certified Mail**

No Insurance Coverage Provided.  
Do not use for International Mail (See reverse)

Sent to	Walter P Bussels
Street Number	JEA
Post Office, State, & ZIP Code	JACKSONVILLE FL
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date	0310047-002-AC 1-29-99

PS Form 3800, April 1995