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JUL 27 1992

Division of Air  
Resources Management

ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

Certified Mail No. P 971-587-783  
Return Receipt Requested

July 21, 1992

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

Dear Mr. Fancy:

Pursuant to 40 CFR Part 60, Chapter 17-2, and PSD FL-173, the Orlando Utilities Commission (OUC) is hereby providing notification of the anticipated dates of initial startups for Combustion Turbines C and D as follows:

CT - C August 10, 1992  
CT - D September 14, 1992

Both Combustion Turbines are located at OUC's Indian River Plant, approximately 10 km. south of Titustville, FL (521.5 km. East and 3151.65 km. North).

By copy of this correspondence, I am also providing Notice to DER Central District office.

If you have any questions regarding this transmittal, please contact me at 407/423-9133.

Sincerely,

Robert F. Hicks  
Environmental Engineer

RFH:rc

cc: Alex Alexander - DER Central District Office

*Q. Kasper, EPA  
CHF/PL*

Administration Fax: (407) 236-9616



Purchasing Fax: (407) 423-9199

To May Jimin  
 Date 12/4 Time 9:27

**WHILE YOU WERE OUT**

M Brian Petermann  
 of \_\_\_\_\_  
 Phone 913-339-7124  
Area Code                      Number                      Extension

<input checked="" type="checkbox"/> TELEPHONED	<input checked="" type="checkbox"/> PLEASE CALL
<input type="checkbox"/> CALLED TO SEE YOU	<input checked="" type="checkbox"/> WILL CALL AGAIN
<input type="checkbox"/> WANTS TO SEE YOU	<input type="checkbox"/> URGENT
<input type="checkbox"/> RETURNED YOUR CALL	

Message \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

NO  
 Operator

Conference call this morning  
 OUC Indian River  
 25 sources ↔ combining  
 Impact area - 50 km area  
 want idea of density - most  
 conc at about 10 km

Look at 1-year 1982 must  
 they use all 5-years. If less  
 than 50-60% of stand.  
 PSD guidelines require 5 years

Monitoring Background for SO<sub>2</sub>  
 24-hr - get and call Brian

Nelson

380 004 F02 (97)

Titusville/TICO Airport off US1  
 June - Dec

24hr ( $\frac{\mu g}{m^3}$ ) Arith mean

GSD-244                      34 29                      7

380 009 H02

lando Util US1 + Kings Hwy  
 in-Dec

24 hr                      Arith mean  
 11 11                      5

GSD-176

PSD APPLICABILITY ANALYSIS

POLLUTANT	MAX EMISSION RATE (LB/HR)	TPY	PSD SIGN EMISS TPY	PCT OF ALLOWABLE
PM	10	43.8	25	175.2
CO	10.1	44.238	100	44.238
NOx	118.3	518.154	40	1295.385
SO2	142.7	625.026	40	1562.565
VOC	4	17.52	40	43.80001
Pb	0	0	.6	0
Be	0	0	.0004	0
Hg	0	0	.1	0
F1	0	0	3	0
H2SO4	0	0	7	0
ASBESTOS	0	0	.007	0
PVC	0	0	1	0
TRS	0	0	10	0
RSC	0	0	10	0

HIT ANY KEY TO CONTINUE

*Gas*

PSD APPLICABILITY ANALYSIS

POLLUTANT	MAX EMISSION RATE		PSD SIGN EMISS TPY	PCT OF ALLOWABLE
	(LB/HR)	TPY		
PM	2.5	10.95	25	43.8
CO	10	43.8	100	43.8
NOx	75.1	328.938	40	822.345
SO2	25.4	111.252	40	278.13
VOC	4	17.52	40	43.80001
Pb	0	0	.6	0
Be	0	0	.0004	0
Hg	0	0	.1	0
F1	0	0	3	0
H2SO4	0	0	7	0
ASBESTOS	0	0	.007	0
PVC	0	0	1	0
TRS	0	0	10	0
RSC	0	0	10	0

HIT ANY KEY TO CONTINUE

PSD APPLICABILITY ANALYSIS

POLLUTANT	MAX EMISSION RATE		PSD SIGN EMISS TPY	PCT OF ALLOWABLE
	(LB/HR)	TPY		
PM	10	43.8	25	175.2
CO	10.1	44.238	100	44.238
NOx	118.3	518.154	40	1295.385
SO2	142.7	625.026	40	1562.565
VOC	4	17.52	40	43.80001
Pb	0	0	.6	0
Be	0	0	.0004	0
Hg	0	0	.1	0
F1	0	0	3	0
H2SO4	0	0	7	0
ASBESTOS	0	0	.007	0
PVC	0	0	1	0
TRS	0	0	10	0
RSC	0	0	10	0

*Oil*

HIT ANY KEY TO CONTINUE

Is the source in a nonattainment area for any emitted pollutant? N

Is the source major only if fugitive emissions are considered in calculating the Total Potential to Emit?

? 0  
RSC -- ENTER EMISSION RATE IN LB/HR.

? 0

### PSD APPLICABILITY ANALYSIS

POLLUTANT	MAX EMISSION RATE (LB/HR)	TPY	PSD SIGN EMISS TPY	PCT OF ALLOWABLE
PM	40	175.2	25	700.8
CO	40.4	176.952	100	176.952
NOx	473.2	2072.616	40	5181.54
SO2	570.8	2500.104	40	6250.261
VOC	16	70.08	40	175.2
Pb	0	0	.6	0
Be	0	0	.0004	0
Hg	0	0	.1	0
F1	0	0	3	0
H2SO4	0	0	7	0
ASBESTOS	0	0	.007	0
PVC	0	0	1	0
TRS	0	0	10	0
RSC	0	0	10	0

HIT ANY KEY TO CONTINUE

### SIGNIFICANT IMPACT ANALYSIS

POLLUTANT	AVG TIME	MAX CONC (µg/m3)	SIGN IMPACT LEVEL (µg/m3)	PCT OF STANDARD
SO2	3-hr	20.3	25	81.2
SO2	24-hr	4.95	5	98.99999
SO2	Annual	.4	1	40
PM	24-hr	.3	5	6
PM	Annual	.3	1	30
NOx	Annual	.3	1	30
CO	1-hr	10	2000	.5
CO	8-hr	1.3	500	.26

If each pollutant's impact is less than significant then the emissions of other facilities need not be considered.

HIT ANY KEY TO RETURN TO THE MAIN MENU

### AMBIENT MONITORING REQUIREMENT ANALYSIS

POLLUTANT	AVG TIME	PREDICTED IMPACT (µg/m3)	DEMIN IMPACT LEVEL (µg/m3)	PCT OF STANDARD
PM	24-hr	.3	10	3
SO2	24-hr	4.95	13	38.07692
NO2	Annual	.3	14	2.142857
CO	8-hr	1.3	575	.226087
VOC	TPY	40	100	40

No building downwash, beyond 1+1.5L

MLOUC

CILITY: OUC Indian River Turbines  
 PE OF MODELING: SO<sub>2</sub> at .8% Sulfur

LLUTANT:	SO <sub>2</sub>	AVG. TIME:	Annual	MAX	OR H2H?
AR	CONC.	DIR.	DIST.	DAY	PERIOD
81+	0.9	180	8000		
82+	1.0	220	8000		
83+	0.8	180	9000		
84+	1.1 *	240	7000		
85+	0.9	240	7000		

SO <sub>2</sub> (.3)	NO <sub>x</sub>	CO	PM <sub>10</sub>	TSP
.4	.3	.03	.03	

LLUTANT:	AVG. TIME:	3-41	MAX	OR H2H?	
AR	CONC.	DIR.	DIST.	DAY	PERIOD
81+	43.2	180	10,000	329	1
82+	54.0 *	180	10,000	68	2
83+	43.4	170	10,000	300	8
84+	45.0	140	10,000	161	2
85+	43.8	320	12,000	211	7

20.3	16.8	1.4	1.4
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LLUTANT:	AVG. TIME:	24-41	MAX	OR H2H?	
AR	CONC.	DIR.	DIST.	DAY	PERIOD
81+	9.7	300	8000	88	
82+	13.2 *	180	10,000	313	
83+	9.6	310	8000	63	
84+	10.7	240	10000	267	
85+	11.9	240	13000	50	

50	4.1	.4	.4
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LLUTANT:	AVG. TIME:	MAX	OR H2H?		
AR	CONC.	DIR.	DIST.	DAY	PERIOD
+					
+					
+					
+					
+					

LLUTANT:	AVG. TIME:	MAX	OR H2H?		
AR	CONC.	DIR.	DIST.	DAY	PERIOD
+					
+					
+					
+					
+					

Table 2

OUC Indian River Plant Combustion Turbines  
 Maximum Air Quality Impacts for Comparison to  
 the De minimus Ambient Levels and the  
 Significant Impact Analysis

Pollutant and Averaging Time	Predicted Impact ( $\mu\text{g}/\text{m}^3$ )	De minimus Ambient Impact Level ( $\mu\text{g}/\text{m}^3$ )	Significant Impact Level ( $\mu\text{g}/\text{m}^3$ )
PM (24-hour)	0.4	10	5
PM (annual)	< 0.1	—	1
SO <sub>2</sub> (3-hour)	20.3	—	25
SO <sub>2</sub> (24-hour)	5.0	13	5
SO <sub>2</sub> (Annual)	0.4	—	1
NO <sub>2</sub> (Annual)	0.3	14	1
CO (1-hour)	1.6 (1)	—	2000
CO (8-hour)	1.4 (2)	575	500

(1) 1-hour CO concentration is based on (3-hour impact) / 0.9

(2) 8-hour CO concentration is based on a 3-hour impact.

$$\bar{X} = 6.05 (10^{-5})$$

$$S = 3.25 (10^{-5})$$

$$CV = \frac{S}{\bar{X}} (100)\%$$
$$= \frac{3.25}{6.05} = .54$$
$$\underline{54\%}$$

Range

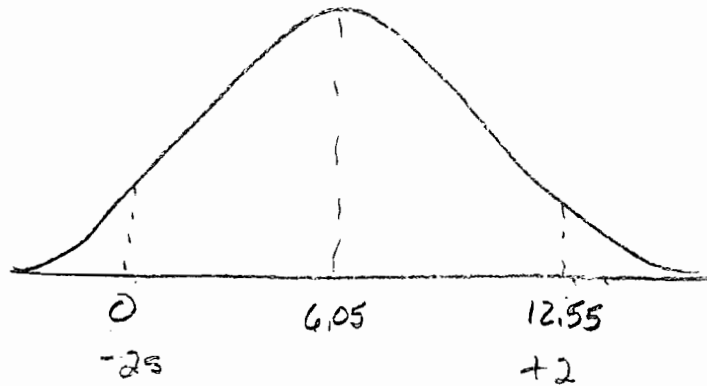
$$5.9 (10^{-5})$$

$$\bar{X} = 9.23 (10^{-4})$$

$$S = 2.55 (10^{-4})$$

$$CV = \frac{2.55}{9.23} = .28$$
$$\underline{28\%}$$

$$5.1 (10^{-4})$$





(17.98)

SO<sub>2</sub> emissions 142.7 lb/hr/unit = 18.0 g/s/unit

4 units = 71.92 g/s

They modeled 191.76 g/s

24 hr HSH Model says 13.17932 μg/m<sup>3</sup>

Applicant ratios by  $\cdot \frac{3}{8} \approx .38$  so impact of 5.01 μg/m<sup>3</sup>

$\approx .375$  so impact of 4.94 μg/m<sup>3</sup>

Sign impact = 5 μg/m<sup>3</sup>

Best Available Control Technology (BACT) Determination  
Orlando Utilities Commission-Indian River Power Plant  
Brevard County

The applicant proposes to install combustion turbine Units C and D at their Indian River facility. The generator systems will consist of two nominal 129 megawatt (MW) combustion turbines.

The combustion turbine will be capable of simple cycle operation. The applicant requested that the combustion turbine use either natural gas or distillate oil. The Department's calculations indicate the maximum annual tonnage of regulated air pollutants emitted from the facility based on 25 percent capacity factor for No. 2 fuel oil firing and 50 percent capacity factor for all fuels at peak load and ISO conditions to be as follows:

Pollutant	Potential Emissions (tons/year)						PSD Significant Emission Rate (tons/yr)
	Peak Load/20 F			Baseload/ISO			
	Natural Gas	Fuel Oil	Combine Fuels	Natural Gas	Fuel Oil	Combine Fuels	
	50% CF*	25% CF	25% CF for oil plus 25% CF for nat. gas	50% CF	25% CF	25% CF for oil plus 25% CF for nat. gas	
NO <sub>x</sub>	591.5	506	801.8	534.5	440	707.3	40
SO <sub>2</sub>	2.1	953	954.1	2.5	839	840.3	40
PM	19.5	237	246.8	17.5	210	218.8	25
PM <sub>10</sub>	19.5	237	246.8	17.5	210	218.8	15
CO	313	159	315.5	287	159	302.5	100
VOC	37	112	130.5	39.5	101	120.8	40
H <sub>2</sub> SO <sub>4</sub>	0.07	28.5	28.5	0.08	25	25	7
Be	0.0	0.01	0.01	0.0	0.01	0.01	0.0004
Hg	0.0	0.01	0.01	0.0	0.01	0.01	0.1
Pb	0.0	0.08	0.08	0.0	0.07	0.07	0.6

\* CF = Capacity Factor

Florida Administrative Code Rule 17-2.500(2)(f)(3) requires a BACT review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in the previous table.

Date of Receipt of a BACT Application

March 7, 1991

BACT Determination Requested by the Applicant

<u>Pollutant</u>	<u>Determination</u>
NO <sub>x</sub>	25 ppmvd @ 15% O <sub>2</sub> (natural gas burning) 42 ppmvd @ 15% O <sub>2</sub> (diesel oil firing)
SO <sub>2</sub>	Firing of natural gas or No. 2 fuel oil with a maximum sulfur content of 0.30%
PM and PM <sub>10</sub>	Combustion control
H <sub>2</sub> SO <sub>4</sub>	Firing of No. 2 fuel oil with a maximum sulfur content of 0.30%
Be	Firing of No. 2 fuel oil

BACT Determination Procedure

In accordance with Florida Administrative Code Chapter 17-2, Air Pollution, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that in making the BACT determination the Department shall give consideration to:

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

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine for the emission source in question the most stringent control available for a similar or identical source or source category. If it is shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly

evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

The air pollutant emissions from simple cycle power plants can be grouped into categories based upon what control equipment and techniques are available to control emissions from these facilities. Using this approach, the emissions can be classified as follows:

- o Combustion Products (Particulates and Heavy Metals). Controlled generally by good combustion of clean fuels.
- o Products of Incomplete Combustion (CO, VOC, Toxic Organic Compounds). Controlled generally by proper combustion techniques.
- o Acid gases (SO<sub>x</sub>, NO<sub>x</sub>, HCl, F<sub>l</sub>). Controlled generally by gaseous control devices.

Grouping the pollutants in this manner facilitates the BACT analysis because it enables the equipment available to control the type or group of pollutants emitted and the corresponding energy, economic, and environmental impacts to be examined on a common basis. Although all of the pollutants addressed in the BACT analysis may be subject to a specific emission limiting standard as a result of PSD review, the control of "nonregulated" air pollutants is considered in imposing a more stringent BACT limit on a "regulated" pollutant (i.e., particulates, sulfur dioxide, fluorides, sulfuric acid mist, etc.), if a reduction in "nonregulated" air pollutants can be directly attributed to the control device selected as BACT for the abatement of the "regulated" pollutants.

#### Combustion Products

The Orlando Utility Commission's projected emissions of particulate matter, PM<sub>10</sub>, and beryllium surpass the significant emission rates given in Florida Administrative Code Rule 17-2.500, Table 500-2 for No.2 fuel oil firing only.

A PM/PM<sub>10</sub> emissions limitation of 0.08 lb/MMBtu for No. 2 fuel oil firing is reasonable as BACT for the Indian River facility.

In general, the BACT/LAER Clearinghouse does not contain specific emission limits for beryllium from turbines. BACT for these heavy metals is typically represented by the level of particulate control. As this is the case, the emission factor of 0.08 lb/MMBtu for particulate matter PM<sub>10</sub> is judged to also represent BACT for beryllium.

#### Products of Incomplete Combustion

The emissions of carbon monoxide and volatile organic compounds are each above the significant level and therefore require a BACT analysis.

Carbon monoxide and VOC are formed during the incomplete combustion of the fuel. High combustion temperatures, adequate excess air and good fuel/air mixing during combustion will minimize CO and VOC emissions. Therefore, NO<sub>x</sub> control methods which use combustion staging and lowering combustion temperature by water injection, can be counterproductive with regard to CO and VOC emissions.

To achieve the proposed NO<sub>x</sub> BACT levels requires that these control techniques be used. Therefore, this turbine design will have significantly higher CO and VOC emissions than associated with a standard combustor. At the proposed BACT NO<sub>x</sub> emissions of 25/42 ppmvd (gas/oil), the turbine will be capable of maintaining CO and VOC emission rates of 25 ppmvd and 5 ppmvd, respectively while burning natural gas. For fuel oil firing, the CO and VOC emission rates will be 25 ppmvd and 15 ppmvd, respectively.

Based on a review of EPA's BACT/LAER Clearinghouse--A Compilation of Control Technology Determinations (1985 and 1990 editions), a combustion turbine with proper combustion control and an oxidizing catalyst that limits CO emissions to 2 ppmvd represents LAER. An oxidizing catalyst is also LAER technology for VOC emissions but the specific ppmvd emission rate was not specified in the clearinghouse document.

Catalytic reduction is a post-combustion method for controlling CO and VOC emissions. The process uses a precious metal to oxidize CO to CO<sub>2</sub> with the use of a catalyst and VOC hydrocarbons to CO<sub>2</sub> and H<sub>2</sub>O. None of the catalyst components are considered toxic. The optimum flue gas temperature range for CO/VOC catalyst operation is between 850°F and 1,100°F. Flue gas from the combustion turbine will typically be between 950°F to 1,100°F. Therefore, a CO/VOC catalyst could be installed at the discharge of the combustion turbine.

The applicant states that the levelized annual cost for the catalyst system is about \$3.5 million/year. This system would reduce about 310 tons per year of CO/VOC at a 50% capacity factor. This reduction results in an incremental removal cost of approximately \$11,000 per ton of CO/VOC removed. This cost is well above that previously accepted as representative of BACT.

In addition, a CO/VOC catalyst located downstream of the combustion turbine exhaust will create additional back pressure reducing output by approximately 600 KW per turbine.

#### Other Emissions

The project will emit trace quantities of other pollutants at levels which are below the significant emission levels established for the PSD program. Federal and state regulations do not require that BACT be applied for these pollutants but the effects of the proposed BACT determinations on these pollutants must be considered.

## Other Regulated and Hazardous Pollutants

The emission rates for mercury, lead and hazardous pollutants, when firing No. 2 fuel oil, have been developed based on manufacturers' information and on information contained in the EPA publications Toxic Air Pollutant Emission Factors--A Compilation for Selected Air Toxic Compounds and Sources (EPA-450/2-88-006a).

The most reliable method of controlling these emissions are complete combustion and the inherent quality of the fuel. Injection of water into the turbines to control NO<sub>x</sub> emissions has a significant effect on controlling these pollutants. Further control has been accomplished by using either a baghouse or scrubber.

## Acid Gases

The emission of sulfur dioxide, nitrogen oxides, and sulfuric acid mist represents a significant proportion of the total emissions and need to be controlled, if deemed appropriate. Sulfur dioxide emissions from combustion turbines are directly related to the sulfur content of the fuel being combusted.

The applicant has proposed the use of natural gas and No. 2 fuel oil with a maximum sulfur content of 0.30 percent to control sulfur dioxide emissions. A review of the latest edition (1990) of the BACT/LAER Clearinghouse indicates that sulfur dioxide emissions from combustion turbines have been controlled by limiting fuel oil sulfur content to a range of 0.1 to 0.30 percent, with the average for the facilities listed being approximately 0.24 percent. As this is the case, the applicant's proposal to use No. 2 fuel oil with a maximum sulfur content of 0.30 percent is judged to represent BACT.

The applicant has stated that BACT for nitrogen oxides will be met using wet (water or steam) injection necessary to limit emissions to 42 ppmvd or 25 ppmvd at 15 percent oxygen when burning No. 2 fuel oil or natural gas, respectively.

A review of the EPA's BACT/LAER Clearinghouse indicates that the lowest NO<sub>x</sub> emission limit established to date for a combustion turbine is 4.5 ppmvd at 15 percent oxygen. This level of control was accomplished through the use of water injection and a selective catalytic reduction (SCR) system contained within the heat recovery steam generator (combined cycle operation). A review of the EPA's BACT/LAER Clearinghouse also indicated that the lowest NO<sub>x</sub> emission levels established to date for a combustion turbine operating in a simple cycle mode was the use of water or steam injection with an improved low NO<sub>x</sub> burner design. The OUC Indian River project will operate in the simple cycle mode.

Selective catalytic reduction is a post-combustion method for control of NO<sub>x</sub> emissions. The SCR process combines vaporized ammonia with NO<sub>x</sub> in the presence of a catalyst to form nitrogen and

water. The vaporized ammonia is injected into the exhaust gases prior to passage through the catalyst bed. The SCR process can achieve up to 90 percent reduction of NOx with a new catalyst. As the catalyst ages, the maximum NOx reduction will decrease to approximately 86 percent. The optimum temperature range for an SCR is approximately 650 to 750 F. Flue gas from a combustion turbine operating in a simple cycle mode will typically be 950 F to 1,100 F. Therefore, the flue gas would have to be cooled prior to the injection of ammonia and to protect the catalyst from damage due to the high flue gas temperatures. SCR manufacturers are currently experimenting with a catalyst that can withstand the high flue gas temperatures associated with simple cycle operation. However, high temperature catalysts are still in a development stage and have not been demonstrated on full scale projects.

Given the applicant's proposed BACT level for nitrogen oxides control stated above, an evaluation can be made of the cost and associated benefit of using SCR as follows:

The applicant had indicated that the total levelized annual cost (operating plus amortized capital) to install SCR for natural gas firing at 50 percent capacity factor is \$3,840,000. For fuel oil firing at 25 percent capacity factor, the total levelized annual cost to install SCR is \$2,940,000. Taking into consideration the total levelized annual cost, a cost/benefit analysis of using SCR can now be developed.

Based on the information supplied by the applicant, it is estimated that the maximum annual NOx emissions with wet injection from the Indian River facility will be 707 tons/year while firing natural gas 25% and fuel oil 25% of the year. Assuming that the SCR would reduce the NOx emissions by an additional 80 to 85 percent, the SCR would control approximately 560 tons of NOx annually. When this reduction is taken into consideration with the total levelized annual cost of \$3,840,000, the cost per ton of controlling NOx is \$6,860. This cost is higher than has previously been approved as BACT.

### Environmental Impact Analysis

The predominant environmental impacts associated with this proposal would be related to the use of SCR for NOx control. The use of SCR results in emissions of ammonia, which may increase with increasing levels of NOx control. In addition, some catalysts may contain substances which are listed as hazardous waste, thereby creating an additional environmental burden. Although the use of SCR does have some environmental impacts, the disadvantages normally do not outweigh the benefit which would be provided by reducing nitrogen oxide emissions by 80 percent.

In addition to the criteria pollutants, the impacts of toxic pollutants associated with the combustion of natural gas and No. 2 fuel oil have been evaluated. Beryllium for oil fired operation

exceeds PSD significance levels. Other toxics are expected to be emitted in minimal amounts, with the total emissions combined to be less than 0.1 tons per year.

Although the emissions of the toxic pollutants could be controlled by particulate control devices such as a baghouse or scrubber, the amount of emission reductions would not warrant the added expense. As this is the case, the Department does not believe that the BACT determination would be affected by the emissions of the toxic pollutants associated with the firing of natural gas or No. 2 fuel oil.

#### Potentially Sensitive Concerns

With regard to controlling NOx emission with SCR, the applicant has identified the following technical limitations:

1. SCR would reduce output of combustion turbines by one percent.
2. SCR could result in the release of unreacted quantities of ammonia to the atmosphere.
3. SCR would require handling of ammonia by plant operators. Since it is a hazardous material, there is concern about safety and productivity of operators.
4. SCR results in contaminated catalyst from flue gas trace elements which could be considered hazardous. Safety of operators and disposal of spent catalyst is a concern.

#### BACT Determination by DER

##### Nox Control

A review of permitting activities for simple cycle proposals across the nation indicates that water or steam injection with improved low NOx burner design is the predominant control technology that has been required. The cost and other concerns expressed by the applicant for using additional control measures are valid.

The information that the applicant presented and Department calculations indicate that the incremental cost of controlling NOx (\$6,860/ton) when firing natural gas (maximum 25%) and No. 2 fuel oil (maximum 25%) is high compared to other BACT determinations which require SCR. Based on the information presented by the applicant and the studies conducted, the



Department believes that the use of SCR for NOx control is not justifiable at this time as BACT. Therefore, the Department is willing to accept low NOx burner design with the firing of natural gas as the primary fuel.

S02 Control

For sulfur dioxide, BACT is represented by firing natural gas (max. 50% CF) or No. 2 fuel oil with an average sulfur content not to exceed 0.30 percent, provided that the capacity attributed to oil firing does not exceed 25 percent.

CO/VOC Control

Based on the additional cost of using an oxidation catalyst (cost \$11,000/ton of reduction), energy (reduce by 600 KW) and environmental considerations, BACT is represented by good combustion controls to achieve 25 ppmvd for CO and 15 ppmvd VOC firing #2 fuel oil.

Other Emissions Control

The emission limitations for PM and PM10, are based on previous BACT determinations for similar facilities, with the heavy metal beryllium being addressed through the particulate limitation and sulfuric acid mist being addressed through the sulfur dioxide limitation.

The emission limits for the Orlando Utilities Commission project are thereby established as follows:

<u>Pollutant</u>	<u>Emission Limit*</u>	
	<u>Natural Gas Firing</u>	<u>No. 2 Fuel Oil Firing</u>
NOx	25 ppmvd @ 15% O <sub>2</sub>	42 ppmvd @ 15% O <sub>2</sub>
SO <sub>2</sub>	Natural gas as fuel	Sulfur content not to exceed 0.30%, by weight
PM & PM <sub>10</sub>	0.003 lb/MMBtu	0.08 lb/MMBtu
CO	25 ppmvd	25 ppmvd
VOC	5 ppmvd	15 ppmvd
Sulfuric Acid Mist	Emissions limited by firing natural gas and No. 2 fuel oil with 0.3% sulfur, by weight	
Beryllium	Emissions limited by firing natural gas and No. 2 fuel oil with 0.3% sulfur, by weight	

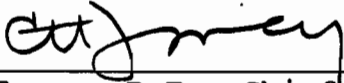
\*Both turbines are limited to a maximum of 50% capacity factor with a maximum of 25% attributed to oil firing.

Details of the Analysis May be Obtained by Contacting:


Preston Lewis, P.E., BACT Coordinator  
Department of Environmental Regulation  
Bureau of Air Regulation  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Recommended by:

Approved by:



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



\_\_\_\_\_  
Carol M. Browner, Secretary  
Dept. of Environmental Regulation

November 1, 1991  
Date

Nov. 5 1991  
Date



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.  
ATLANTA, GEORGIA 30365

JAN 10 1990

4APT-APB-cdw

Mr. C.H. Fancy, P.E.  
Bureau of Air Regulation  
Florida Department of Environmental  
Regulation  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

RE: Orlando Utilities Commission, Indian River Plant (PSD-FL-130)

Dear Mr. Fancy:

This is to acknowledge receipt of your final determination and permits for the above referenced facility's permit modification request, dated December 19, 1989.

As stated in the review of your preliminary determination, we concur with your determination.

Thank you for the opportunity to review and comment on this package. If you have any questions or comments, please contact Mr. Gregg Worley of my staff at (404) 347-2864.

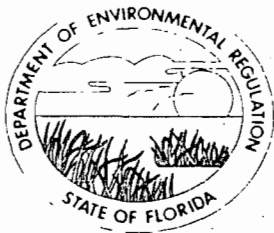
Sincerely yours,

*Bruce P. Miller*

Bruce P. Miller, Chief  
Air Programs Branch  
Air, Pesticides, and Toxics  
Management Division

cc: *P. Laval*  
*C. Collins, C Dist.*  
*CHF/BT*

RECEIVED  
JAN 16 1990  
DER-GRJM



# Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

January 9, 1990

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. William Herrington  
Orlando Utilities Commission  
500 South Orange Avenue  
Orlando, Florida 32802

Dear Mr. Herrington:

Re: Permit Nos. AC 05-144482, -146749, -146750, -146751 and  
PSD-FL-130 for Orlando Utilities Commission's Indian River  
Combustion Turbines.

A typographical error in the above referenced permits should be corrected to reflect that the PM<sub>10</sub> (particulate matter less than 10 microns in size) emissions, tabulated for inventory purposes, are equal to the total particulate emissions - 20 lbs/hr/unit, 87.6 tons per year (TPY)/unit, and 350 TPY for 4 units, when fired with distillate oil.

This letter shall be attached to your construction permits mentioned above, and shall become a part of those permits.

Sincerely,

Dale Twachtmann  
Secretary

DT/plm

c: C. Collins, C. District  
W. Aronson, EPA  
C. Shaver, NPS  
J. Crall, OUC  
S. Day, Black & Veatch

**SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4. Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1.  Show to whom delivered, date, and addressee's address. (Extra charge)  
 2.  Restricted Delivery (Extra charge)

3. Article Addressed to:  
 Mr. William Herrington  
 Orlando Utilities Commission  
 500 South Orange Avenue  
 Orlando, FL 32802

4. Article Number  
 P 938 762 806

Type of Service:  
 Registered  Insured  
 Certified  COD  
 Express Mail  Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature - Address

6. Signature - Agent  
 *W. Herrington*

7. Date of Delivery

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

PS Form 3811, Mar. 1988 • U.S.G.P.O. 1988-212-865 DOMESTIC RETURN RECEIPT

P 938 762 806

**RECEIPT FOR CERTIFIED MAIL**

NO INSURANCE COVERAGE PROVIDED  
 NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to  
 Mr. William Herrington, OUC

Street and No.  
 500 South Orange Ave.

P.O., State and ZIP Code  
 Orlando, FL 32802

Postage	S
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	S

Postmark or Date  
 Mailed: 1-12-90  
 Permit: AC 144482, -146749  
 -50, -51 PSD-130

PS Form 3800, June 1985



PSD-FL-130A

## Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

### STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION NOTICE OF PERMITS

Mr. William Herrington  
Orlando Utilities Commission  
500 South Orange Avenue  
Orlando, Florida 32802

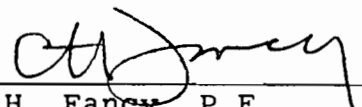
December 19, 1989

Enclosed are construction permits Nos. AC 05-144482, -146749, -146750, -146751, and PSD-FL-130 to Orlando Utilities Commission for a revision of the particulate matter emissions from the combustion turbines located at the Indian River Plant, Brevard County, Florida. These permits are issued pursuant to Section 403, Florida Statutes.

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

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL REGULATION

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

Copy furnished to:

C. Collins, C. District  
W. Aronson, EPA  
C. Shaver, NPS  
J. Crall, OUC  
S. Day, Black and Veatch

**SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.**  
 Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1.  Show to whom delivered, date, and addressee's address (Extra charge)  
 2.  Restricted Delivery (Extra charge)

3. Article Addressed to:  
 Mr. William Herrington  
 Orlando Utilities Commission  
 500 South Orange Avenue  
 Orlando, FL 32802

4. Article Number:  
 P 938 762 787

Type of Service:  
 Registered  Insured  
 Certified  COD  
 Express Mail  Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature  Address   
 X

6. Signature  Agent   
 X *W. Herrington*

7. Date of Delivery

8. Addressee's Address *ONLY if requested (extra paid)*  


PS Form 3811, Mar. 1988 • U.S.G.P.O. 1988-212-865 DOMESTIC RETURN RECEIPT

P 938 762 787

**RECEIPT FOR CERTIFIED MAIL**  
 NO INSURANCE COVERAGE PROVIDED  
 NOT FOR INTERNATIONAL MAIL  
 (See Reverse)

Sent to Mr. William Herrington,	
Street and No. OUC 500 S. Orange Ave.	
P.O., State and ZIP Code Orlando, FL 32802	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date Permit: AC 05-144482, 14679 -146750, -146751, PSD-FL-130 Mailed: 12-21-89	

PS Form 3800, June 1985

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on 12-21-89.

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

Kimi J. J. J.  
Clerk

12-21-89  
Date



Final Determination

Orlando Utilities Commission  
Indian River Plant  
Titusville, Brevard County, Florida

Combustion Turbine Facility

CT-A, AC 05-144482  
CT-B, AC 05-146749  
CT-C, AC 05-146750  
CT-D, AC 05-146751

PSD-FL-130 A

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

December 8, 1989

## Final Determination

OUC's application for a revision of the particulate matter emissions from the combustion turbines at the Indian River Plant in Brevard County, Florida, has been reviewed by the Bureau of Air Regulation.

Public notice of the Intent to Issue the permits was published in the Florida Today on November 2, 1989.

Copies of the Preliminary Determination have been available for public inspection at the Department's Central District office in Orlando, and the Department's Bureau of Air Regulation office in Tallahassee.

Comments received from OUC are as follows:

- a) Specific Condition No. 7 needs to reflect the 20 lbs/hr/unit particulate emissions as mentioned in the Preliminary Determination.
- b) Specific Condition No. 17 poses a conflict for OUC where the operation permit application is required to be submitted within 45 days of compliance test completion.

The Department is in agreement with OUC's comment (a), and so Specific Condition No. 7 will be amended.

DER recognizes OUC's convenience in obtaining operation permits for all four units at the same time. However, DER also recognizes the possible delays/changes in the construction schedule for CT-C (combustion turbine C) and CT-D. Therefore, although Specific Condition No. 17 will not be reworded (for the future construction of CT-C and CT-D), DER will allow OUC to apply for operation permits for CT-A and CT-B within 60 days after the issuance of this permit.

The final action of the Department is to issue the permit as proposed in the Preliminary Determination with the above mentioned change to Specific Condition No. 7.



ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FL 32817 • 407/423-9100

RECEIVED

NOV 14 1989

DER-BAQM

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

November 9, 1989

Mr. Bill Thomas  
Department of Environmental Regulation  
Bureau of Air Regulation  
2600 Blainstone Road  
Tallahassee, FL 32399-2400

Dear Mr. Thomas:

Enclosed is the proof of publication required by Section 403.815, F.S. and DER Rule 17-103.150, F.A.C. for the Permit Modification of the Indian River Plant gas turbines numbers:

AC 05-144482  
AC 05-146749  
AC 05-146750  
AC 05-146751

The publication date was November 2, 1989 and we plan to submit our comments prior to December 1, 1989.

Thank you and your staff for the continued cooperation on this project.

Sincerely,

J. S. Crall  
Director  
Environmental Division

JSC/cs  
Enclosure

xc: W. H. Herrington  
F. F. Haddad  
S. M. Day (B & V)

CAPE PUBLICATIONS, INC.

The Times

Published Weekly on Wednesdays

THE TRIBUNE

Published Weekly on Wednesdays



Published Daily

STATE OF FLORIDA
COUNTY OF BREVARD

Before the undersigned authority personally appeared Linda L. Spicer who on

oath says that he/she is Legal Advertising Clerk

of the FLORIDA TODAY, a newspaper published in Brevard County,

Florida; that the attached copy of advertising being a Legal Notice

in the matter of permit to Orlando Utilities Commission

in the Court

was published in the FLORIDA TODAY NEWSPAPER

in the issues of November 2, 1989

Affiant further says that the said FLORIDA TODAY NEWSPAPER

is a newspaper published in said Brevard County, Florida and that the said newspaper has heretofore been continuously published in said Brevard County, Florida regularly as stated above, and has been entered as second class mail matter at the post office in COCOA

said Brevard County, Florida for a period of one year next preceeding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in said newspaper.

Handwritten signature of Linda L. Spicer

Sworn and subscribed to before me this

2nd November 1989 day of A.D., 19

Handwritten signature of Notary Public

Notary Public State of Florida

11/02/89

State of Florida Department of Environmental Regulation Notice of Intent to Issue The Department of Environmental Regulation hereby gives notice of its intent to issue modified permits to Orlando Utilities Commission, 500 South Orange Avenue, Orlando, Florida 32802, for the gas turbine project at the Indian River Plant in Brevard County, Florida. A revision of Best Available Control Technology (BACT) was not required. The revised maximum degree of Class II TSP increment consumed is 25% (3-yr) and 1% (annual). The maximum combined pollutant concentrations from the turbines and other sources in the area will be less than the National Ambient Air Quality Standards (NAAQS). The NAAQS are levels set by the EPA which identify the ambient concentration necessary to protect human health and welfare with an adequate margin of safety. The Department is issuing this intent to issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 170.57, 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 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 170.57, Florida Statutes.

The petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

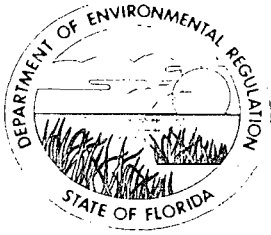
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests may be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 170.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at: Department of Environmental Regulation Bureau of Air Regulation 2600 Blair Stone Road Tallahassee, Florida 32399-2400

Dept. of Environmental Regulation Central District Office 3319 Maguire Blvd., Suite 232 Orlando, Florida 32803-3747

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination. Furthermore, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice. T0099891-17-11/2, 1989. Thursd. 7



# Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

**PERMITTEE:**  
Orlando Utilities Commission  
500 S. Orange Avenue  
Orlando, Florida 32802

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751  
PSD-FL-130

Expiration Date: Jan. 31, 1992

County: Brevard

Latitude/Longitude: 28°29'32"N  
80°46'59"W

Project: Combustion Turbines,  
CT-A, CT-B, CT-C, and CT-D.

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

For the construction of four simple cycle GE Frame 6 combustion turbines, each with about 35 MW capacity, at the existing Indian River Plant, Brevard County, Florida. The turbines will primarily fire natural gas. Distillate oil will be fired during periods of curtailed or uneconomical natural gas supply. Nitrogen oxide emissions will be controlled by water injection.

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

Attachments are listed below:

1. OUC's application package dated January 18, 1988.
2. DER's letter concerning application fees dated February 15, 1988.
3. DER's letter for additional information dated March 10, 1988.
4. DER's letter containing EPA's comments dated March 18, 1988.
5. OUC's letter received April 18, 1988.
6. Black & Veatch (B&V) letter received May 5, 1988.
7. OUC's letter received May 13, 1988.
8. B & V's letter received May 18, 1988.

PERMITTEE:  
Orlando Utilities Commission

Permit Nos. AC 05-144482  
-146749  
-146750  
-146751  
PSD-FL-130

Attachments Continued:

9. B & V's letter received June 13, 1988.
10. B & V's letter received June 16, 1988.
11. B & V's letter received June 21, 1988.
12. Fish & Wildlife Service letter received July 5, 1988.
13. OUC's comments received August 18, 1988.
14. Preliminary and Final Determinations dated July 15 and August 26, 1988, respectively.
15. OUC's letter received February 27, 1989.
16. DER's letter dated March 8, 1989.
17. OUC's letter received September 5, 1989.
18. DER's Preliminary Determination dated October 26, 1989.
19. OUC's letter received November 27, 1989.
20. DER's Final Determination dated December 8, 1989.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.
4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

PERMITTEE:  
Orlando Utilities Commission

Permit Nos. AC 05-144482  
-146749  
-146750  
-146751  
PSD-FL-130

GENERAL CONDITIONS:

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

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

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

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

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

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

PERMITTEE:  
Orlando Utilities Commission

Permit Nos. AC 05-144482  
-146749  
-146750  
-146751  
PSD-FL-130

GENERAL CONDITIONS:

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

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

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

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

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

13. This permit also constitutes:

- (x) Determination of Best Available Control Technology (BACT)
- (x) Determination of Prevention of Significant Deterioration (PSD)
- (x) Compliance with New Source Performance Standards

14. The permittee shall comply with the following:

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



PERMITTEE:  
Orlando Utilities Commission

Permit Nos. AC 05-144482  
-146749  
-146750  
-146751  
PSD-FL-130

**GENERAL CONDITIONS:**

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

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

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

**SPECIFIC CONDITIONS:**

1. These permits replace the previous permits issued with the same numbers on August 26, 1988. Upon issuance of these permits, the previous permits will be void.

2. Each turbine may operate continuously (8,760 hrs/year).

3. Only natural gas or distillate oil shall be fired in the turbine.

4. The maximum heat input to each turbine shall not exceed 445 MMBtu/hr, at sea level and 59°F (see Attachment 13 for a plot of heat input vs. temperature).

PERMITTEE:  
Orlando Utilities Commission

Permit Nos. AC 05-144482  
-146749  
-146750  
-146751  
PSD-FL-130

SPECIFIC CONDITIONS:

5. The maximum allowable emissions from the turbine(s) in accordance with the BACT determination, shall not exceed the following, at sea level and 59°F:

Pollutant	Fuel	lb/hr/unit	TPY/unit	TPY/4 units
NOx	Gas	75.1	328.9	1316
	Oil	118.3	518.2	2073
SO <sub>2</sub>	Gas	0.34	1.5	6
	Oil	142.7	625.0	2500

6. Visible emissions shall not exceed 5% opacity while burning natural gas or 10% opacity while burning distillate oil.

7. The following emissions are tabulated for PSD and inventory purposes:

Pollutant	Fuel	Emissions		
		lbs/hr/unit	TPY/unit	TPY 4 units
Carbon Monoxide	Gas	10.0	43.8	175
	Oil	10.0	44.2	177
Total Particulates	Gas	2.5	11.0	44
	Oil	20.0	87.6	350
PM <sub>10</sub>	Gas	2.5	11.0	44
	Oil	10.0	43.8	175
VOC	Gas	4.0	17.5	70
	Oil	4.0	17.5	70
Sulfuric Acid Mist	Oil	10.0	44.0	176
Beryllium	Oil	0.0001	0.0005	0.0018

8. The distillate oil sulfur content shall not exceed 0.3% by weight.

9. Water injection shall be utilized for NOx control. The water to fuel ratio at which compliance is achieved shall be incorporated into the permit and shall be monitored.

10. Both start and black start capability shall be provided by a No. 2 fuel oil fired 800 HP internal combustion diesel (for each turbine), projected to run for approximately 10 minutes per start. These diesels are expected to emit minimal air emissions (15 lbs SO<sub>2</sub>/yr/unit).

11. Initial (I) compliance tests shall be performed using both fuels. Annual (A) compliance tests shall be performed with the fuel(s) used for more than 170 hours in the preceding 12 month period. Tests shall be conducted using EPA methods in accordance with the July 1, 1987 version of 40 CFR 60 Appendix A:

PERMITTEE:  
Orlando Utilities Commission

Permit Nos. AC 05-144482  
-146749  
-146750  
-146751  
PSD-FL-130

SPECIFIC CONDITIONS:

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

Tests for Be and SO<sub>2</sub> are to be conducted for oil only. Compliance with SO<sub>2</sub> limits may be demonstrated by testing all oil shipments for sulfur content less than 0.30 percent using ASTM D 2880-71.

Any unit which has accumulated 170 hours burning fuel oil during the preceding 12 month period shall conduct an annual test using fuel oil.

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

12. The project shall comply with all the applicable requirements of Chapter 17-2, Florida Administrative Code and the July 1, 1987 version of 40 CFR 60 Subpart GG, Gas Turbines.

13. DER's Central District office shall be notified in writing a minimum of 15 days prior to source testing. Written reports of the tests shall be submitted to the Central District office within 30 days of test completion.

14. Any change in the method of operation, fuels, equipment or operating hours shall be submitted for approval to the Central District office.

15. If construction does not commence on all four units within 18 months of issuance of this permit, then the permittee shall obtain from DER a review and, if necessary, a modification of the control technology and allowable emissions for the unit(s) on which construction has not commenced (40 CFR 52.21(r)(2)). The proposed schedule indicates construction commencement dates of October 1988 for units 1 and 2, and November 1989 for units 3 and 4.

PERMITTEE:  
Orlando Utilities Commission

Permit Nos. AC 05-144482  
-146749  
-146750  
-146751  
PSD-FL-130

**SPECIFIC CONDITIONS:**

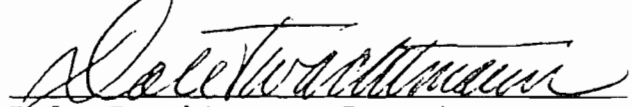
16. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. 17-4.090).

17. An application for an operation permit must be submitted to the Central District office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing (for CT-C and CT-D), whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. 17-4.220).

18. Specifically for CT-A and CT-B, the permittee shall apply for an operation permit within 60 days of the issuance of this permit.

Issued this 18 day  
of Dec, 1989

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL REGULATION

  
Dale Twachtmann, Secretary

Attachment 13



ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 305/423-9100  
CERTIFIED RETURN RECEIPT REQUESTED

August 17, 1988

Florida Department of  
Environmental Regulation  
Bureau of Air Quality Management  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400  
ATTN: Mr. Bill Thomas

RECEIVED

AUG 22 1988

DER-BAQM

Dear Mr. Thomas:

We appreciate your continuing efforts in the processing of our PSD permit application for the four unit combustion turbine project at the Indian River Plant, Brevard County, Florida.

We would like to present the following comments on four of the specific conditions contained in the proposed permit attached to your letter of July 18.

Specific Condition 3 incorrectly specifies the maximum heat input. Each turbine is baseload rated at 445 Million BTU/hr (not 112) on oil at sea level and 59° F as specified in Section III E of the application. As you are aware, the ambient temperature affects the capacity of combustion turbines with lower temperatures serving to increase their maximum heat input firing rate. The amount of water required for NO<sub>x</sub> control also affects turbine performance. The enclosed two figures of heat input vs. temperature provide the range of heat input values expected for the GE frame 6 turbine for oil and natural gas. The center line on each figure is the rated baseload curve with maximum water injection. The top line represents the peak load values which could be sustained for only short periods of time without extensive maintenance. This line has also been adjusted to represent the higher heating value of the fuel (HHV). The bottom line represents the baseload condition with no water injection and is adjusted to represent the lower heating value of the fuel (LHV). Thus the figures provide the "normal" maximum capability vs. temperature and the range around that value. Based on the preceding discussion, Condition 3 should read, "The maximum heat input to each turbine shall not exceed the maximum values in the attached Figures of Heat Input vs. Temperature for the OUC Indian River Combustion Turbines." OUC is also providing copies of various GE correction charts and letter of expected performance which were used to develop the two Figures.

Specific condition 12 is currently incorrect as written since the proposed Unit 3 commence construction date is within 18 months of

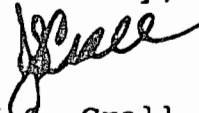
the permit issuance date. We are hereby notifying you our intent to change the proposed commence construction date of Unit 4 from November 1990 to November 1989 so that it too will fall within 18 months of the permit issuance date. Our proposed new specific condition 12 would read "If construction does not commence on any of the four units within 18 months of the date of this permit issuance, then the permittee shall obtain from the Department a review and, if necessary, a modification of the control technology and allowable emission limits for any such unit. The proposed schedule indicates construction commencement dates of October 1988 for Units 1 & 2, and November 1989 for Units 3 & 4."

We are concerned that Specific Condition 2 could be read to imply a limitation with regard to the combustion of oil. This would be inconsistent with the permit application and the Department's BACT analysis. We have been assured by DER staff that this is not the Department's intent. Rather, the intent was to include in the permit the Department's preference that natural gas be burned if available. We are suggesting that the second sentence in Specific Condition 2 be moved to the second paragraph of the permit on page one following the second sentence in the paragraph to read "Natural gas is the expected primary fuel with distillate oil to be used if the units are needed during periods of curtailed or uneconomical natural gas supply."

Specific Condition B specifies the initial and annual compliance tests to be conducted. We would like to see the requirement to test annually on oil be limited to any unit burning fuel oil more than 170 hours in the preceding 12 month period. It would require 170 hours/year of operation on oil to create 40 tons of NO<sub>x</sub> from oil combustion. This would allow OUC to avoid firing the units on oil to do testing when the units have been used only slightly on oil. For item (a), under Specific Condition 12, we agree with the use of EPA test method 20 for NO<sub>x</sub>. For SO<sub>2</sub>, we propose testing all oil shipments using ASTM D2880-71 for sulfur content less than 0.30 percent as a demonstration of compliance rather than stack testing. We propose that no SO<sub>2</sub> testing be conducted for natural gas because of the very low emission rates. For item (c) we propose testing for particulate matter on oil only since particulate emissions from the combustion of natural gas are also minimal.

We appreciate your attention to these matters.

Sincerely,

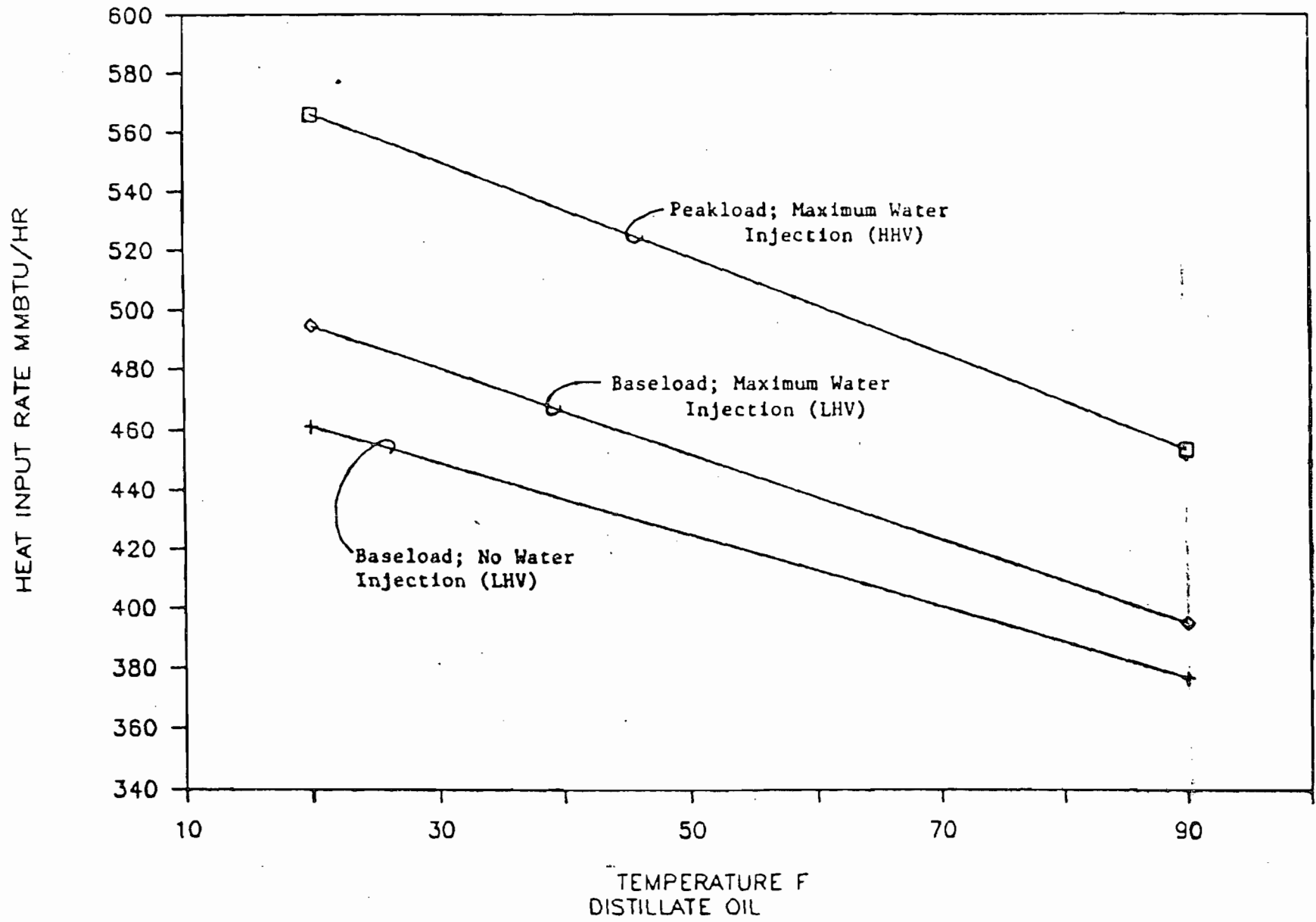


J.S. Crall  
Director  
Environmental Division

JSC:sp  
Enclosure  
xc: W.H. Herrington  
F.F. Haddad  
K.P. Ksionek  
T.D. Slepow  
S.M. Day, B&V  
Pradeep A. Raval, DER

# OUC IRP COMBUSTION TURBINES

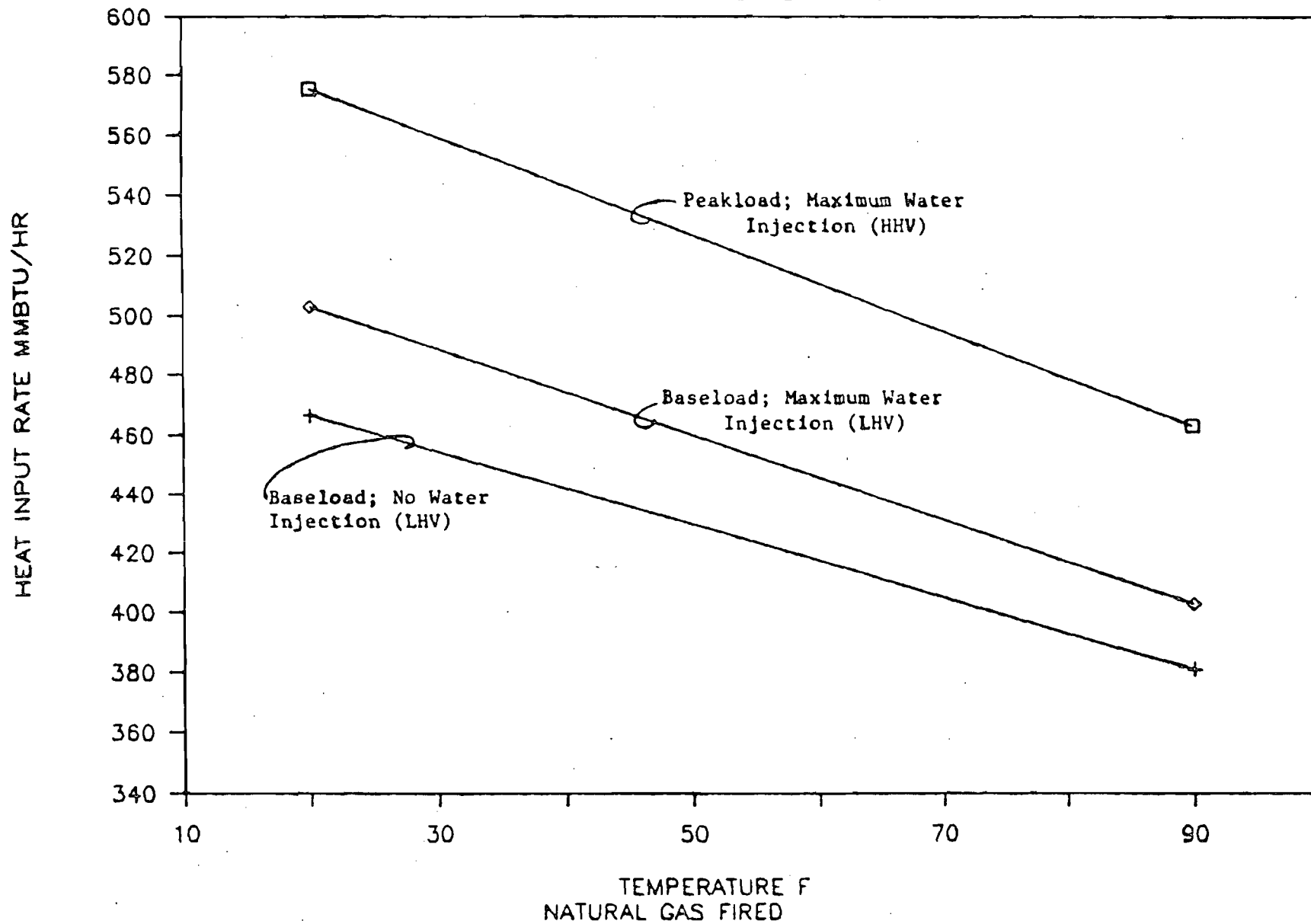
## HEAT INPUT VS TEMPERATURE





# OUC IRP COMBUSTION TURBINES

## HEAT INPUT VS TEMPERATURE



Other Attachments Available Upon Request



State of Florida  
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee	
To: <b>RECEIVED</b>	Location: _____
To: _____	Location: _____
To: _____	Location: _____
From: _____	Date: <b>JAN 10 1990</b>

# Interoffice Memorandum Office of the Secretary

TO: Dale Twachtmann  
FROM: Steve Smallwood *Steve Smallwood*  
DATE: January 8, 1990  
SUBJ: Approval of Construction Permit Amendment  
Orlando Utilities Commission  
Indian River Combustion Turbine Project, PSD-FL-130

Attached for your approval and signature is a construction permit amendment prepared by the Bureau of Air Regulation for Orlando Utilities Commission's Indian River turbine project at their existing facility in Brevard County, Florida.

I recommend your approval and signature.

Attachment

SS/plm



RECEIVED

NOV 27 1989

ORLANDO UTILITIES COMMISSION

DER-BAQM

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

CERTIFIED MAIL/RETURN RECEIPT REQUESTED

November 21, 1989

Mr. Bill Thomas  
Florida Department of  
Environmental Regulation  
Bureau of Air Regulation  
2600 Blairstone Road  
Tallahassee, FL 32399-2400

Re: PSD-FL-130

Dear Mr. Thomas:

We appreciate your continuing efforts in modifying our PSD construction permit for the four unit combustion turbine project at our Indian River Plant.

We would like to present the following comments on two specific conditions of the proposed modifications to the permit attached to Mr. Fancy's letter of October 26.

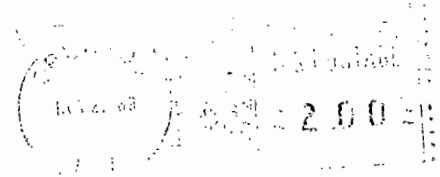
Specific Condition 7 needs to reflect the 20 lbs/hr/unit Total Particulates and PM<sub>10</sub> as described in the Technical Evaluation and Preliminary Determination for Permit Modification signed and sealed on October 26.

Specific Condition 17 appears to be a significant change from the previous language regarding when an operational permit application must be submitted. The original language in the third paragraph of Specific Condition 10 allowed us to apply for an operational permit 90 days prior to expiration of the construction permit, thus recognizing we could make application for all four operational permits at one time. We are concerned that the new language could be read to imply that an application for an operational permit must be sought within 45 days after performance testing of each combustion turbine and, therefore, places us in immediate non-compliance with CT-A and CT-B. We propose to retain the original language in the new format.



ORLANDO UTILITIES  
COMMISSION

P. O. BOX 3193  
ORLANDO, FLORIDA 32802



Mr. Bill Thomas  
Florida Department of  
Environmental Regulation  
Bureau of Air Regulation  
2600 Blainstone Road  
Tallahassee, FL 32399-2400

Mr. Bill Thomas

- 2 -

November 21, 1989

Except for the above two comments, the new permit appears to be an improvement with regards to clarity and organization. Again, thank you for your cooperation.

Very truly yours,



J. S. Crall  
Director  
Environmental Division

JSC/cs

xc: W. H. Herrington  
F. F. Haddad  
K. P. Ksionek  
T. D. Slepow  
S. M. Day (B&V)

*copied: P. Laval  
C. Collins  
CHF/BT*



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.  
ATLANTA, GEORGIA 30365

4APT-APB-cdw

NOV 15 1989

Mr. C.H. Fancy, P.E.  
Bureau of Air Regulation  
Florida Department of Environmental  
Regulation  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

RECEIVED  
NOV 20 1989  
DER-BAQM

RE: Orlando Utilities Commission, Indian River Plant (PSD-FL-130)

Dear Mr. Fancy:

This is to acknowledge receipt of your preliminary determination and draft permits for the above referenced facility's permit modification request, dated October 26, 1989.

We have reviewed the request to alter the particulate emission limits for the turbines when firing fuel oil and concur with your decision.

Thank you for the opportunity to review and comment on this package. If you have any questions or comments, please contact Mr. Gregg Worley of my staff at (404) 347-2864.

Sincerely yours,

*Wayne Johnson*

Bruce P. Miller, Chief  
Air Programs Branch  
Air, Pesticides, and Toxics  
Management Division

cc: P. Raval  
C/F/BT



## Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

October 26, 1989

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. William Herrington  
Orlando Utilities Commission  
500 South Orange Avenue  
Orlando, Florida 32802

Dear Mr. Herrington:

Re: Permit Modification for Indian River Plant Gas Turbines  
Numbers: AC 05-144482, -146749, -146750, and -146751

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit for OUC's gas turbine project at the Indian River Plant in Brevard County, Florida.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Mr. Bill Thomas of the Bureau of Air Regulation.

Sincerely,

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

CHF/pr


Attachments

cc: C. Collins, C District  
W. Aronson, EPA  
C. Shaver, NPS  
J. Crall, OUC  
S. Day, Black & Veatch



**SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.  
 Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1.  Show to whom delivered, date, and addressee's address. 2.  Restricted Delivery (Extra charge)

3. Article Addressed to: Mr. William Herrington Orlando Utilities Commission 500 South Orange Avenue Orlando, Florida 32802	4. Article Number P. 065 251 056
Type of Service: <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail <input type="checkbox"/> Return Receipt for Merchandise	
Always obtain signature of addressee or agent and DATE DELIVERED.	
5. Signature - Address X	8. Addressee's Address (ONLY if requested and fee paid)
6. Signature - Agent X <i>William</i>	
7. Date of Delivery	

PS Form 3811 Mar. 1988 • U.S.G.P.O. 1988-212-865 DOMESTIC RETURN RECEIPT

P 065 251 056  
**RECEIPT FOR CERTIFIED MAIL**  
 NO INSURANCE COVERAGE PROVIDED  
 NOT FOR INTERNATIONAL MAIL  
 (See Reverse)

Sent to Mr. William Herrington, OUC	
Street and No. 500 South Orange Avenue	
P.O., State and ZIP Code Orlando, FL 32802	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date	
Permit: AC 05-15582, -146750	
PSD-FL-130 -146749, -51	
Mailed: 10-27-89	

PS Form 3800, June 1985

BEFORE THE STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of  
Application for Permit by:

Orlando Utilities Commission	DER File Nos. AC 05-144482
500 South Orange Avenue	AC 05-146749
Orlando, FL 32802	AC 05-146750
	AC 05-146751
	PSD-FL-130

---

INTENT TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue permits (copy attached) for the project as detailed in the application specified above. The Department is issuing this Intent to Issue for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, Orlando Utilities Commission, applied on August 31, 1989, to the Department of Environmental Regulation for a modification of the construction permit for the gas turbine project at the Indian River Plant located in Brevard County, Florida.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that an air construction permit is required for the proposed work.

Pursuant to Section 403.815, F.S. and DER Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days, in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "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. The applicant shall provide proof of publication to the Department, at the address specified within 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.

The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, 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 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information;

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

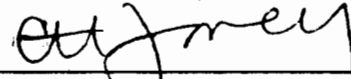
(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, 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 decision of the Department with regard to the applicant have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office in General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person

has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL REGULATION



---

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

Copies furnished to:

C. Collins, C District  
W. Aronson, EPA  
C. Shaver, NPS  
J. Crall, OUC  
S. Day, Black & Veatch

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on 10/27/89.

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

Kim Jaben  
Clerk

10/27/89  
Date

**BEST AVAILABLE COPY**

State of Florida  
Department of Environmental Regulation  
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue modified permits to Orlando Utilities Commission, 500 South Orange Avenue, Orlando, Florida, 32802, for the gas turbine project at the Indian River Plant in Brevard County, Florida. A revision of Best Available Control Technology (BACT) was not required. The revised maximum degree of Class II TSP increment consumed is 25% ( 3-hr) and 1% (annual). The maximum combined pollutant concentrations from the turbines and other sources in the area will be less than the National Ambient Air Quality Standards (NAAQS). The NAAQS are levels set by the EPA which identify the ambient concentration necessary to protect human health and welfare with an adequate margin of safety. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, 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 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information;

- (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
- (b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
- (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
- (d) A statement of the material facts disputed by Petitioner, if any;
- (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

**BEST AVAILABLE COPY**

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, 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 decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

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

Department of Environmental Regulation  
Bureau of Air Regulation  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Dept. of Environmental Regulation  
Central District Office  
3319 Maguire Blvd, Suite 232  
Orlando, Florida 32803-3767

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination. Furthermore, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

**BEST AVAILABLE COPY**

**Technical Evaluation  
and  
Preliminary Determination**

**Orlando Utilities Commission  
Indian River Plant  
Titusville, Brevard County, Florida**

**Combustion Turbine Facility**

**CT-A, AC 05-144482  
CT-B, AC 05-146749  
CT-C, AC 05-146750  
CT-D, AC 05-146751**

**PSD-FL-130**

**Florida Department of Environmental Regulation  
Bureau of Air Regulation**

**October 26, 1989**



### Technical Evaluation

The Department received a permit modification request dated August 31, 1989, for a revision of the particulate matter (PM) emission limit for the above project.

DER had required initial tests to verify the vendor's projected PM emissions rate, and the permitted rate, of 10 lb/hr for each turbine. Results from initial performance tests on the two turbines installed, out of the four proposed at the Indian River Plant, indicate PM emissions in excess of the permit limit of 10 lbs/hr when burning fuel oil. CT-A (Combustion Turbine-A) averaged 15.3 lbs/hr while CT-B averaged 21.9 lbs/hr. The data submitted by GE since then explained how the earlier emission estimates had not accounted for water injection, a NOx control measure for the turbines. GE has revised their earlier estimates of 10 lb/hr to 17 lb/hr. This revised estimate is based on the performance of the turbines operated using water injection.

The increase in the PM emissions requires a reevaluation of the project for changes in source operation, rule applicability, emission limitations, BACT, and ambient air impacts.

The Department has determined that the revised emissions do not significantly alter any of the aspects of the earlier project review. DER will revise the PM emission limitations to 20 lb/hr considering GE's data and anticipating a certain amount of operation variation. The PM limit proposed by OUC of 30 lb/hr is not justified. Furthermore, it should be noted that the turbines were tested at close to the diverging section of the stack, and not in strict accordance with the probe location requirements in Chapter 17-2 of the Florida Administrative Code. It is projected that had the probe location been proper the PM would have been somewhat lower.

The PM ambient air impacts estimated in the Preliminary Determination dated July 15, 1988, will change based on a revised emissions limit of 20 lbs/hr as follows:

	<u>Previously Predicted</u> <u>Impact (ug/m<sup>3</sup>)</u>	<u>Revised Predicted</u> <u>Impact (ug/m<sup>3</sup>)</u>
PM 24 hour	0.4	0.8
Annual	< 0.1	< 0.2

Note: The PM Deminimus Ambient Impact Level is 10 ug/m<sup>3</sup> (24-hr).  
The PSD Significant Impact Level is 5 ug/m<sup>3</sup> (24-hr) and  
1 ug/m<sup>3</sup> (annual).

The calculations which have been submitted by the permittee on September 18, 1989, quantifying the effects of the location of the sampling point on PM emissions, are accepted as additional information only. These calculations have not been evaluated, certainly not endorsed or validated in any manner by the Department. The BACT determination will remain unchanged, requiring the use of low sulfur fuel.

Since DER's intent in requiring the PM test has been served (obtaining representative emissions), the permits will be modified to no longer require testing for PM. The PM emission information will be noted in the permits for PSD and inventory purposes.

Conclusion

Based on the information provided by OUC, the Department has reasonable assurance that the revision of the PM emissions from the gas turbine project at the Indian River Plant, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.





## Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

**PERMITTEE:**  
Orlando Utilities Commission  
500 S. Orange Avenue  
Orlando, Florida 32802

**Permit Numbers:** AC 05-144482  
05-146749  
05-146750  
05-146751  
PSD-FL-130

**Expiration Date:** Jan. 31, 1992

**County:** Brevard

**Latitude/Longitude:** 28°29'32"N  
80°46'59"W

**Project:** Combustion Turbines,  
CT-A, CT-B, CT-C, and CT-D.

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

For the construction of four simple cycle GE Frame 6 combustion turbines, each with about 35 MW capacity, at the existing Indian River Plant, Brevard County, Florida. The turbines will primarily fire natural gas. Distillate oil will be fired during periods of curtailed or uneconomical natural gas supply. Nitrogen oxide emissions will be controlled by water injection.

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

Attachments are listed below:

1. OUC's application package dated January 18, 1988.
2. DER's letter concerning application fees dated February 15, 1988.
3. DER's letter for additional information dated March 10, 1988.
4. DER's letter containing EPA's comments dated March 18, 1988.
5. OUC's letter received April 18, 1988.
6. Black & Veatch (B&V) letter received May 5, 1988.
7. OUC's letter received May 13, 1988.
8. B & V's letter received May 18, 1988.

**PERMITTEE:**  
Orlando Utilities Commission

Permit Nos. AC 05-144482  
-146749  
-146750  
-146751  
PSD-FL-130

**Attachments Continued:**

9. B & V's letter received June 13, 1988.
10. B & V's letter received June 16, 1988.
11. B & V's letter received June 21, 1988.
12. Fish & Wildlife Service letter received July 5, 1988.
13. OUC's comments received August 18, 1988.
14. Preliminary and Final Determinations dated July 15 and August 26, 1988, respectively.
15. OUC's letter received February 27, 1989.
16. DER's letter dated March 8, 1989.
17. OUC's letter received September 5, 1989.
18. DER's Preliminary Determination dated October 26, 1989.

**GENERAL CONDITIONS:**

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.
4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

PERMITTEE:  
Orlando Utilities Commission

Permit Nos. AC 05-144482  
-146749  
-146750  
-146751  
PSD-FL-130

**GENERAL CONDITIONS:**

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

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

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

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

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

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

PERMITTEE:  
Orlando Utilities Commission

Permit Nos. AC 05-144482  
-146749  
-146750  
-146751  
PSD-FL-130

**GENERAL CONDITIONS:**

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

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

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

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

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

13. This permit also constitutes:

- (x) Determination of Best Available Control Technology (BACT)
- (x) Determination of Prevention of Significant Deterioration (PSD)
- (x) Compliance with New Source Performance Standards

14. The permittee shall comply with the following:

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

PERMITTEE:  
Orlando Utilities Commission

Permit Nos. AC 05-144482  
-146749  
-146750  
-146751  
PSD-FL-130

**GENERAL CONDITIONS:**

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

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

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

**SPECIFIC CONDITIONS:**

1. These permits replace the previous permits issued with the same numbers on August 26, 1988. Upon issuance of these permits, the previous permits will be void.

2. Each turbine may operate continuously (8,760 hrs/year).

3. Only natural gas or distillate oil shall be fired in the turbine.

4. The maximum heat input to each turbine shall not exceed 445 MMBtu/hr, at sea level and 59°F (see Attachment 13 for a plot of heat input vs. temperature).

PERMITTEE:  
Orlando Utilities Commission

Permit Nos. AC 05-144482  
-146749  
-146750  
-146751  
PSD-FL-130

**SPECIFIC CONDITIONS:**

5. The maximum allowable emissions from the turbine(s) in accordance with the BACT determination, shall not exceed the following, at sea level and 59°F:

Pollutant	Fuel	lb/hr/unit	TPY/unit	TPY/4 units
NOx	Gas	75.1	328.9	1316
	Oil	118.3	518.2	2073
SO <sub>2</sub>	Gas	0.34	1.5	6
	Oil	142.7	625.0	2500

6. Visible emissions shall not exceed 5% opacity while burning natural gas or 10% opacity while burning distillate oil.

7. The following emissions are tabulated for PSD and inventory purposes:

Pollutant	Fuel	Emissions		
		lbs/hr/unit	TPY/unit	TPY 4 units
Carbon Monoxide	Gas	10.0	43.8	175
	Oil	10.0	44.2	177
Total Particulates	Gas	2.5	11.0	44
	Oil	10.0	43.8	175
PM <sub>10</sub>	Gas	2.5	11.0	44
	Oil	10.0	43.8	175
VOC	Gas	4.0	17.5	70
	Oil	4.0	17.5	70
Sulfuric Acid Mist	Oil	10.0	44.0	176
Beryllium	Oil	0.0001	0.0005	0.0018

8. The distillate oil sulfur content shall not exceed 0.3% by weight.

9. Water injection shall be utilized for NOx control. The water to fuel ratio at which compliance is achieved shall be incorporated into the permit and shall be monitored.

10. Both start and black start capability shall be provided by a No. 2 fuel oil fired 800 HP internal combustion diesel (for each turbine), projected to run for approximately 10 minutes per start. These diesels are expected to emit minimal air emissions (15 lbs SO<sub>2</sub>/yr/unit).

11. Initial (I) compliance tests shall be performed using both fuels. Annual (A) compliance tests shall be performed with the fuel(s) used for more than 170 hours in the preceding 12 month period. Tests shall be conducted using EPA methods in accordance with the July 1, 1987 version of 40 CFR 60 Appendix A:



PERMITTEE:  
Orlando Utilities Commission

Permit Nos. AC 05-144482  
-146749  
-146750  
-146751  
PSD-FL-130

**SPECIFIC CONDITIONS:**

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

Tests for Be and SO<sub>2</sub> are to be conducted for oil only. Compliance with SO<sub>2</sub> limits may be demonstrated by testing all oil shipments for sulfur content less than 0.30 percent using ASTM D 2880-71.

Any unit which has accumulated 170 hours burning fuel oil during the preceding 12 month period shall conduct an annual test using fuel oil.

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

12. The project shall comply with all the applicable requirements of Chapter 17-2, Florida Administrative Code and the July 1, 1987 version of 40 CFR 60 Subpart GG, Gas Turbines.

13. DER's Central District office shall be notified in writing a minimum of 15 days prior to source testing. Written reports of the tests shall be submitted to the Central District office within 30 days of test completion.

14. Any change in the method of operation, fuels, equipment or operating hours shall be submitted for approval to the Central District office.

15. If construction does not commence on all four units within 18 months of issuance of this permit, then the permittee shall obtain from DER a review and, if necessary, a modification of the control technology and allowable emissions for the unit(s) on which construction has not commenced (40 CFR 52.21(r)(2)). The proposed schedule indicates construction commencement dates of October 1988 for units 1 and 2, and November 1989 for units 3 and 4.

PERMITTEE:  
Orlando Utilities Commission

Permit Nos. AC 05-144482  
-146749  
-146750  
-146751  
PSD-FL-130

**SPECIFIC CONDITIONS:**

16. 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 (F.A.C. 17-4.090).

17. An application for an operation permit must be submitted to the Central District office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. 17-4.220).

Issued this \_\_\_\_\_ day  
of \_\_\_\_\_, 1989

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL REGULATION

---

Dale Twachtmann, Secretary

**Attachment 13**



file copy

## ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 305/423-9100  
CERTIFIED RETURN RECEIPT REQUESTED

August 17, 1988

Florida Department of  
Environmental Regulation  
Bureau of Air Quality Management  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400  
ATTN: Mr. Bill Thomas

RECEIVED

AUG 22 1988

DER-BAQM

Dear Mr. Thomas:

We appreciate your continuing efforts in the processing of our PSD permit application for the four unit combustion turbine project at the Indian River Plant, Brevard County, Florida.

We would like to present the following comments on four of the specific conditions contained in the proposed permit attached to your letter of July 18.

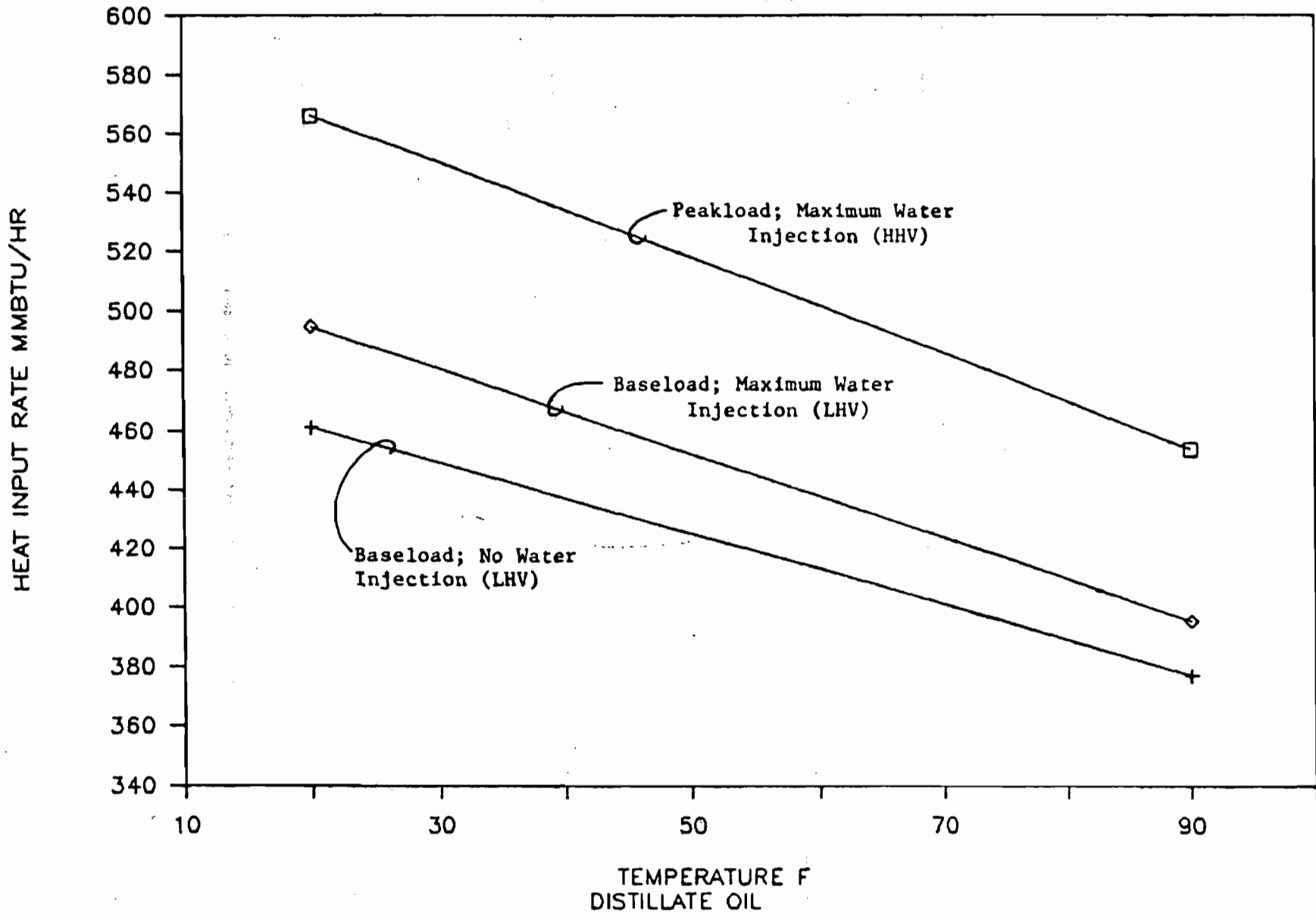
Specific Condition 3 incorrectly specifies the maximum heat input. Each turbine is baseload rated at 445 Million BTU/hr (not 112) on oil at sea level and 59° F as specified in Section III E of the application. As you are aware, the ambient temperature affects the capacity of combustion turbines with lower temperatures serving to increase their maximum heat input firing rate. The amount of water required for NO<sub>x</sub> control also affects turbine performance. The enclosed two figures of heat input vs. temperature provide the range of heat input values expected for the GE frame 6 turbine for oil and natural gas. The center line on each figure is the rated baseload curve with maximum water injection. The top line represents the peak load values which could be sustained for only short periods of time without extensive maintenance. This line has also been adjusted to represent the higher heating value of the fuel (HHV). The bottom line represents the baseload condition with no water injection and is adjusted to represent the lower heating value of the fuel (LHV). Thus the figures provide the "normal" maximum capability vs. temperature and the range around that value. Based on the preceding discussion, Condition 3 should read, "The maximum heat input to each turbine shall not exceed the maximum values in the attached Figures of Heat Input vs. Temperature for the OUC Indian River Combustion Turbines." OUC is also providing copies of various GE correction charts and letter of expected performance which were used to develop the two Figures.

Specific condition 12 is currently incorrect as written since the proposed Unit 3 commence construction date is within 18 months of



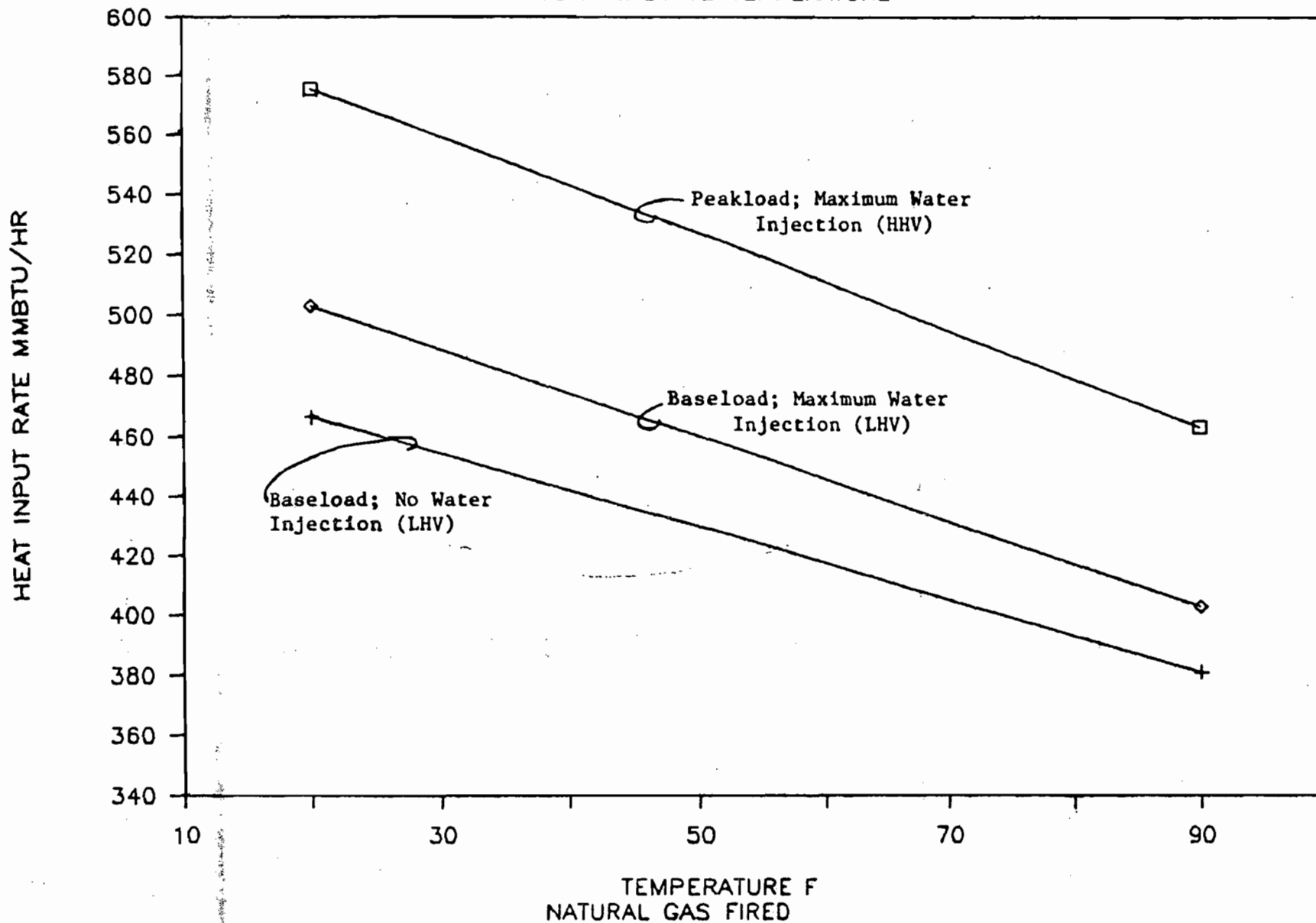
# OUC IRP COMBUSTION TURBINES

## HEAT INPUT VS TEMPERATURE



# OUC IRP COMBUSTION TURBINES

## HEAT INPUT VS TEMPERATURE



**Other Attachments Available Upon Request**





United States Department of the Interior  
FISH AND WILDLIFE SERVICE



IN REPLY REFER TO:

MAILING ADDRESS:  
Post Office Box 25486  
Denver Federal Center  
Denver, Colorado 80225

STREET LOCATION:  
134 Union Blvd.  
Lakewood, Colorado 80228

RW Air Quality  
Mail Stop 60130

29 SEP 1989

RECEIVED  
OCT 2 1989  
DER-BAQM

Mr. C.H. Fancy, P.E., Deputy Chief  
Bureau of Air Quality Management  
Florida Department of Environmental Regulation  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

We have reviewed the information you forwarded to us regarding Orlando Utilities Commission's request to increase the permitted particulate matter rate for the new gas turbines at their Indian River plant. The Indian River plant is located approximately 175 km east of Chassahowitzka National Wildlife Refuge (NWR), a class I area administered by the U.S. Fish and Wildlife Service. We appreciate your continued cooperation in notifying us of projects that have the potential to impact the air quality or air quality related values of our class I lands.

Results of initial performance tests indicate that particulate matter emissions from turbine CT-A ranged from 12.65 to 19.4 lb/hr (average of 15.3 lb/hr) and particulate matter emissions from turbine CT-B ranged from 17.83 to 24.93 lb/hr (average of 21.9 lb/hr) when burning oil. Based on the performance tests results, Orlando Utilities requests that you increase the permitted limit for the turbines from the current 10 lb/hr rate to 30 lb/hr.

Considering the relatively long distance from the Indian River plant to the Chassahowitzka NWR, we do not expect that the proposed increase in particulate matter emissions would significantly impact resources at the refuge. However, in order to minimize local impacts from the turbine emissions we offer the following comments for your consideration. First, since particulate matter, nitrogen oxides, and sulfur dioxide emissions from the turbines would be much less when burning gas as compared to oil, and the turbines are capable of burning both gas and oil, we recommend that you encourage Orlando Utilities to fire the turbines with gas rather than oil. Also, because turbines CT-A & B are identical, we would expect that the emissions from the turbines would be similar. However, during the performance tests the particulate matter emissions from turbine CT-B averaged over 43% higher than those from turbine CT-A. Unless Orlando Utilities can explain the discrepancy in the test results, and provide

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Mr. C. L. Farnley, P.E.  
Deputy Chief, Bureau of Air Quality Dept.  
Florida Dept. of Environ. Reg.  
Twin Towers Office Bldg.  
2600 Blair Stone Rd  
Tallahassee, FL 32399-2400

further justification for the proposed 30 lb/hr emission rate, we recommend that the revised particulate matter rate be closer to the test results for turbine CT-A (i.e., 15-16 lb/hr).

If you have any questions regarding this matter, please contact John Bunyak of our Air Quality Office at (303) 969-2071.

Sincerely,



Ralph F. Fries  
Acting Assistant Regional Director  
Refuges and Wildlife, Region 6

*copied: P. Laval  
B. Andrews  
D. Rogers  
C. Collins, c Dist.  
CHF|BT*



ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

September 18, 1989

Mr. Pradeep Raval  
Bureau of Air Quality Management  
Florida Department of  
Environmental Regulation  
2600 Blainstone Road  
Tallahassee, FL 32399-2400

RECEIVED

SEP 19 1989

DER-BAQM

Re: PSD-FL-130 Modification to Permit

Dear Mr. Raval:

Per your request, I had Black & Veatch develop correction factors to be applied to compensate for the location of the ports. Attached is this estimate as supplied to me by Black & Veatch in their letter of September 14, 1989.

If the Department concurs with this estimate and uses it to establish maximum emissions per unit, I request that the calculation be made a part of the permit.

We appreciate your cooperation and understanding in this matter. If you have any questions, please call me at 407/423-9141, Steve Day (B&V) at 913/339-2880 or Al Ferguson (B&V) at 913/339-2199.

Sincerely,

J. S. Crall  
Director  
Environmental Division

JSC/cs  
Attachment

xc: S. M. Day (B&V)

*expid: Larry Anderson*  
*max*  
*Nancy Bronson, EPA*  
*Chris Sharkey, OPS*  
*Chuck Collins, C&W*  
*SKP/BT*  
*Jim Pennington*

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Company IR FORWARDING SYSTEMS Department/Floor No. FL Dept. of Environmental Regs. Company Department/Floor No.

Street Address 317 EAST LAND STREET RD Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes) 2600 BIGSTONE RD

City Orlando FL State ZIP Required 32824 City Tallahassee FL State ZIP Required 32399

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REVISION DATE 8/89 PART #119501 FXEM 7/89 FORMAT #014 1989 F.E.C. PRINTED IN U.S.A.

**BLACK & VEATCH**

ENGINEERS-ARCHITECTS

TEL. (913) 339-2000

**RECEIVED**

Orlando Utilities Commission  
Indian River Plant, CT Project  
TSP Measurements

SEP 18 89

OUC-ENVD

1500 MEADOW LAKE PARKWAY  
MAILING ADDRESS P.O. BOX NO. 8405  
KANSAS CITY, MISSOURI 64114

B&V Project 14137  
B&V File 32.0404  
September 14, 1989

Orlando Utilities Commission  
500 South Orange Avenue  
Orlando, Florida 32802

Attention: Mr. James S. Crall  
Director, Environmental Division

Gentlemen:

The measurement of particulate emissions from Combustion Turbine Units A and B were conducted in an expanding section of the duct. This location is immediately adjacent to turns and bends in the flue gas duct and does not meet the requirement for proper stack sampling. GE located the sampling ports there because no duct or stack locations were available which met the criteria for sampling. To achieve a proper sampling port location within the existing duct, the silencer would have had to be removed to perform the sampling.

The test measurements include a measurement of the gas flow rate. However the measured gas flow rate is much higher than the gas flow rate that Black & Veatch has calculated to have occurred during the test using the F-factor method. We believe that the F-factor method for estimating the gas flow rate is more accurate than the value obtained during the measurement due to the location of the sampling ports. In view of this, the application of a correction factor to the measured data is appropriate.

The high measurement of gas flow rate indicates turbulent gas flow in the duct at the point of measurement. The concentration of large particles of particulate matter will vary across a flue gas duct in an environment of turbulent gas flow making estimates of the appropriate correction factor difficult. However very small particles of particulate will retain a uniform concentration in a turbulent flow acting much the same as the gas itself. Since the particulate emissions in a combustion turbine are mostly fine particles, the correction factor can be approximated as the ratio of the actual (calculated) flue gas flow rate to the measured flue gas flow rate.

The enclosed calculations provide the estimated correction factors to be applied to the measured particulate emission rates. With these correction factors applied, the estimated average particulate emission rate from Unit A becomes 9.6 pounds per hour and for Unit B it becomes 15.4 pounds per hour.

BLACK & VEATCH

Orlando Utilities Commission  
Mr. James S. Crall,

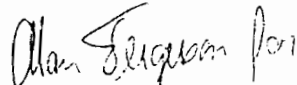
2

B&V Project 14137  
September 14, 1989

If you have any questions regarding these estimates of correction factors,  
please call me at 913-339-2880 or Al Ferguson at 913-339-2199.

Very truly yours,

BLACK & VEATCH



Steven M. Day

Enclosure



Owner Orlando Utilities  
 Plant Indian River Unit CTA-CTB  
 Project No. 12105 File No. \_\_\_\_\_  
 Title Estimate Particulate Emissions

傅格遵  
 SEP 13, 1989  
 Computed By AWF  
 Date 9/12 19 89  
 Checked By \_\_\_\_\_  
 Date \_\_\_\_\_ 19 \_\_\_\_  
 Page 1 of 4

DO NOT WRITE IN THIS SPACE

Purpose: The purpose of these calculations is to estimate the particulate emissions from CTA and CTB using the measured data from the emissions tests. The test ports were in a very turbulent area which resulted in measurement of gas flow which was higher than should exist at that point.

Ref. TSA Test Report CTA and CTB

Measured gas flow during particulate runs

- CTA
- Run 1 7/26/89 - 854,407 acfm - 295,450 dscfm
  - Run 2 7/27/89 - 853,157 acfm - 295,743 dscfm
  - Run 3 7/27/89 - 857,662 acfm - 283,445 dscfm

RECEIVED  
 SEP 15 89  
 OUC-ENVD

Calculate gas flow using "F" factors

"F" factor for fuel oil =  $F_d = 9190$  dscf/MBtu  
 $F_w = 10320$  scf/MBtu  
 $F_C = 1420$  scf/MBtu

Fuel oil flow rate				lb/sec	Btu/lb
Run 1	7/26/89	17:30 - 18:57	pm	6.05	19,533
Run 2	7/27/89	07:05 - 08:21	am	6.26	19,533
Run 3	7/27/89	08:43 - 10:02	am	6.13	19,533

RGN-172A





Flue Gas Flow Rate CTA

$$\text{Run 1} - \frac{9190 \text{ dscf}}{\text{MBtu}} \times 0.019533 \frac{\text{MBtu}}{\text{lb fuel}} \times \frac{6.05 \text{ lb fuel}}{\text{sec}} \times \frac{60 \text{ sec}}{\text{min}} \times \frac{20.9}{(20.9-13.5)}$$

Adjustment for excess air from "F" factor

= 184,037 dscfm

$$\text{Run 2} - \frac{9190 \text{ dscf}}{\text{MBtu}} \times 0.019533 \frac{\text{MBtu}}{\text{lb fuel}} \times \frac{6.26 \text{ lb fuel}}{\text{sec}} \times \frac{60 \text{ sec}}{\text{min}} \times \frac{20.9}{(20.9-13.45)}$$

= 189,147 dscfm

$$\text{Run 3} - \frac{9190 \text{ dscf}}{\text{MBtu}} \times 0.019533 \frac{\text{MBtu}}{\text{lb fuel}} \times \frac{6.13 \text{ lb fuel}}{\text{sec}} \times \frac{60 \text{ sec}}{\text{min}} \times \frac{20.9}{(20.9-13.6)}$$

= 189,025 dscfm

Particulate Emissions

The measured flow rate is higher than the calculated flow rate as would be expected for flow not perpendicular to the pitot tube. This also means that the measured concentration is equal to or higher than actual because of super-isokinetic sampling. This is because the expected particle size distribution is low for this source. That is all the particles are expected to be small, these small particles will follow the gas streamlines and be relatively evenly distributed across the combustion turbine duct. Sampling above isokinetic gas was done at this location would result in an abnormally high weight of those particles being trapped on the filter and weighed. This would not be true if all the particles were large. In that instance the particles would cross the streamlines. If we assume that the measured particulate concentration is correct we will either estimate emissions which are too high or correct. This is the approach which will be used.

DO NOT WRITE IN THIS SPACE

RGN-172A



CTA Estimated Emissions

Run 1

Concentration from TSA report

$$184,037 \frac{\text{dscf}}{\text{min}} \times \frac{60 \text{ min}}{\text{hr}} \times \frac{2.13 \times 10^{-7} \text{ lb}}{\text{dscf}} = 2.87 \text{ lb/hr}$$

Run 2

$$189,147 \frac{\text{dscf}}{\text{min}} \times \frac{60 \text{ min}}{\text{hr}} \times \frac{1.09 \times 10^{-6} \text{ lb}}{\text{dscf}} = 12.4 \text{ lb/hr}$$

Run 3

$$189,025 \frac{\text{dscf}}{\text{min}} \times \frac{60 \text{ min}}{\text{hr}} \times \frac{8.21 \times 10^{-7} \text{ lb}}{\text{dscf}} = 9.31 \frac{\text{lb}}{\text{hr}}$$

Avg. 9.86 lb/hr

CTB Estimated Emissions

Fuel Oil Flow Rate CTB

Run	Date	Time	O <sub>2</sub>	Part lb/dscf	Fuel Oil Flow
Run 4	7/28/89	09:25 - 10:42	13.5	1.25 x 10 <sup>-6</sup>	6.32 lb/sec
Run 5	7/28/89	11:00 - 12:16	14.5	1.00 x 10 <sup>-6</sup>	6.22 lb/sec
Run 6	7/28/89	12:30 - 13:44	14.5	1.44 x 10 <sup>-6</sup>	6.15 lb/sec

Flue Gas Flow Rate CTB

$$\text{Run 4 } 9190 \frac{\text{dscf}}{\text{MBtu}} \times 0.019537 \frac{\text{MBtu}}{\text{lb fuel}} \times \frac{6.32 \text{ lb fuel}}{\text{sec}} \times \frac{60 \text{ sec}}{\text{min}} \times \frac{20.9}{(20.9-13.5)} = 192,290 \text{ dscfm}$$

$$\text{Run 5 } 9190 \frac{\text{dscf}}{\text{MBtu}} \times 0.019537 \frac{\text{MBtu}}{\text{lb fuel}} \times \frac{6.22 \text{ lb fuel}}{\text{sec}} \times \frac{60 \text{ sec}}{\text{min}} \times \frac{20.9}{(20.9-14.5)} = 218,817 \text{ dscfm}$$

$$\text{Run 6 } 9190 \frac{\text{dscf}}{\text{MBtu}} \times 0.019537 \frac{\text{MBtu}}{\text{lb fuel}} \times \frac{6.15 \text{ lb fuel}}{\text{sec}} \times \frac{60 \text{ sec}}{\text{min}} \times \frac{20.9}{(20.9-14.5)} = 216,354 \text{ dscfm}$$

DO NOT WRITE IN THIS SPACE

PGN-172A



CTB Estimated Emissions

$$\text{Run 4 } 192,290 \frac{\text{scf}}{\text{min}} \times \frac{60 \text{ min}}{\text{hr}} \times 1.25 \times 10^{-6} \frac{\text{lb}}{\text{scf}} = 14.4 \text{ lb/hr}$$

$$\text{Run 5 } 218,817 \frac{\text{scf}}{\text{min}} \times \frac{60 \text{ min}}{\text{hr}} \times 1.00 \times 10^{-6} \frac{\text{lb}}{\text{scf}} = 13.1 \text{ lb/hr}$$

$$\text{Run 6 } 216,354 \frac{\text{scf}}{\text{min}} \times \frac{60 \text{ min}}{\text{hr}} \times 1.44 \times 10^{-6} \frac{\text{lb}}{\text{scf}} = 18.7 \text{ lb/hr}$$

$$\text{Avg } 15.4 \text{ lb/hr}$$

This correction should be repeated for any future particulate sampling which occurs at this site. The following values should be determined for the new tests.

Fuel Flow Rate - lb/sec

Heat Value of the Fuel - Btu/lb

Particulate concentration - lb/scf

O<sub>2</sub> at sample site - %

With these new values ~~and~~ the other values, the equations shown above can be used for future particulate emission estimates.

DO NOT WRITE IN THIS SPACE

PGN-172A



## ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

REGISTERED MAIL  
RECEIPT REQUESTED

August 31, 1989

Bureau of Air Quality Management  
Florida Department of  
Environmental Regulation  
2600 Blairstone Road  
Tallahassee, FL 32399-2400

Attention: Mr. C. H. Fancy

Gentlemen:

Based on the results of initial performance tests on the Indian River Plant's combustion turbines when burning fuel oil, OUC is hereby requesting the modification of particulate emission requirements contained in Florida DER permit numbers 05-144482, 05-146749, 05-146750, and 05-146751.

Results from initial performance tests at the Indian River Plant combustion turbines CT-A and CT-B when burning fuel oil, indicate particulate emission in excess of permit requirements of 10 lb/h listed in Florida DER permit numbers 05-144482 (CT-A) and 05-146749 (CT-B). CT-A and CT-B had average particulate emissions of approximately 15.3 lb/h (test values of 12.65, 19.4, and 13.97 lb/h) and 21.9 lb/h (test values of 23.0, 17.83, and 24.93 lb/h), respectively. The combustion turbines were operated in an optimized manner for NO<sub>x</sub> control during these tests and as such emission results are indicative of best results obtainable during any period of operation.

The particulate emission limit of 10 lb/h contained in the existing permits is based on information provided by General Electric (the combustion turbine manufacturer) in a letter dated May 27, 1987, (copy attached). On March 6, 1989, General Electric provided a letter (copy attached) which revised their original prediction of particulate emissions to 17 lb/h. Based on performance test results and allowances for performance degradation, General Electric now recommends a particulate emission requirement of 30 lb/h when burning fuel oil for each combustion turbine (see attached telecopy dated August 22, 1989).

Particulate and PM<sub>10</sub> emission estimated (based on a 10 lb/h emission rate) contained in the original PSD application for this project indicate that particulate and PM<sub>10</sub> are applicable pollutants for PSD analysis. Accordingly, increasing the particulate emission rate to 30 lb/h will not affect previous pollutant applicability evaluations. In addition, increasing

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SEP 5 1989  
DER-BAQM

August 31, 1989

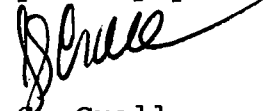
particulate emissions will still yield modeled ground level impacts below the significant impact level. Therefore, multisource modeling for particulate would still not be required.

The Best Available Control Technology analysis with regard to particulate emissions from the facility remains unchanged. Emissions of particulates from the combustion turbine facility will be controlled by ensuring as complete combustion of the fuel as possible. The NSPS for combustion turbines do not establish any emission limit for particulates nor require testing for particulate. A review of the EPA's "BACT/LAER Clearinghouse - A Compilation of Control Technology Determinations" (1985 edition and subsequent supplements) did not reveal any more stringent particulate control technologies being used on gas/oil fueled combustion turbines. Therefore, BACT for particulates emissions from the combustion turbines remains complete combustion of the fuel.

We are also requesting a waiver of additional particulate emission testing and, therefore, the need to relocate the ports (see attached letter from Garry Kuberski dated August 21, 1989). Since the idea of one time initial particulate testing was to serve as a performance indication and not specifically required on an annual basis for compliance, please accept our current results from the tests as performed.

Based on the above considerations, OUC proposes to increase particulate emission limits for the Indian River Plant combustion turbines when burning fuel oil to 30 lb/h. We appreciate you and your staff's continuing efforts on this project. If you have any questions regarding this modification request, please feel free to call either me (407-423-9141), John Cochran, B&V (913-339 2190), or Steve Day B&V (913-339-2880).

Very truly yours,



J. S. Crall  
Director  
Environmental Division

JSC/cs

xc: W. H. Herrington  
F. F. Haddad

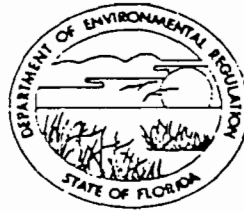
cc. P. Rawal  
B. Andrews  
M. Linn  
W. Aronson, EPA  
C. Swaver, NPS  
C. Collins, C. Dist

} Rawal  
9-7-89

AMENDED/MODIFIED

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION



BOB GRAHAM  
GOVERNOR

VICTORIA J. TSCHINKEL  
SECRETARY

G. DOUG DUTTON  
DISTRICT MANAGER

NORTHEAST DISTRICT

3426 BILLS ROAD  
JACKSONVILLE, FLORIDA 32207

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Combustion Turbine Facility [] New<sup>1</sup> [] Existing<sup>1</sup>

APPLICATION TYPE: [] Construction [] Operation [] Modification

COMPANY NAME: Orlando Utilities Commission COUNTY: Brevard

Identify the specific emission point source(s) addressed in this application (i.e. Lime  
Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Four Unit Combustion  
Turbine Facility

SOURCE LOCATION: Street Indian River Plant City Titusville (10 km north of site)

UTM: East 521.5 km North 3151.6 km

Latitude 28 ° 29 ' 32 "N Longitude 80 ° 46 ' 59 "W

APPLICANT NAME AND TITLE: Orlando Utilities Commission

APPLICANT ADDRESS: 500 South Orange Avenue, Orlando, Florida 32802

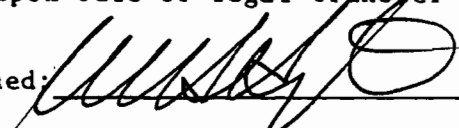
SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative\* of Orlando Utilities Commission

I certify that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

\*Attach letter of authorization

Signed: 

William H. Herrington, Manager Electric Operations  
Name and Title (Please Type)

Date: 8/31/89 Telephone No. 305-423-9140

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

<sup>1</sup> See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.



Signed DD Schultz

Donald D. Schultz  
Name (Please Type)

Black & Veatch, Engineers-Architects  
Company Name (Please Type)

P. O. Box 8405, Kansas City, Missouri 64114  
Mailing Address (Please Type)

Florida Registration No. 30304 Date: August 31, 1989 Telephone No. 913-339-2000

**SECTION II: GENERAL PROJECT INFORMATION**

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

See Section 2.0 of the Application to Construct AND ATTACHED LETTER DATED AUGUST 31, 1989.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction October 1988 Completion of Construction September 1989

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The combustion turbine facility will be equipped with water injection to control NO<sub>x</sub> emissions. However, a cost estimate for the water treatment and injection system is not available at this time.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

None

GENERAL  ELECTRIC

UTILITY & INDUSTRIAL SALES DIVISION  
GENERAL ELECTRIC COMPANY • POST OFFICE BOX 10577 • TAMPA, FLORIDA 33679 • (813) 873-4827

May 27, 1987

**RECEIVED**

Orlando Utilities Commission

MAY 28

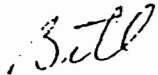
INDIAN RIVER PLANT.

Mr. Tim Slepow  
Project Engineer  
Indian River Station  
Orlando Utilities Commission  
RD #2 - Box 30  
Titusville, FL 32780

Dear Tim:

Attached is the information that you requested regarding volume of water required for water injection for the simple cycle MS-6000B gas turbine, 2½ inches back pressure ISO conditions. Additional information is included that you may find useful while talking to your environmental people. If you have any additional questions, please call.

Regards,



W. A. Smoak  
Generation Sales Engineer

WAS:sc

Attachment



MS6001B  
 Estimated Performance With Diluent Injection  
 To Meet EPA NSPS  
 (75 ppmvd NOx @ 15% O<sub>2</sub> With Heat Rate Correction)  
 2" Hga Back Pressure

	<u>Nat. Gas</u>	<u>Nat. Gas</u>	<u>Dist.</u>	<u>Dist.</u>
Output, kW	38350	38260	37980	38310
Heat Rate, Btu/kWh (LHV)	11020	10740	11210	10720
Heat Consumpt., 10 <sup>6</sup> Btu/lb (LHV)	422.6	410.9	425.8	410.7
Exhaust Flow, 10 <sup>3</sup> lb/h (1)	1090	1082.4	1097	1093.5
Exhaust Temp., F (1)	1004	1006	1004	1005
Water Flow, lb/h	8890	---	13360	---
Water/Fuel	0.44	---	0.58	---
Steam Flow, lb/h (3)	---	8500	---	17000
Steam/Fuel, (3)	---	0.44	---	0.76
CO, ppmvd*	10	10	10	10
UHC, ppmvw**	10	10	10	10
Particulates (2), lb/h	<2.5	<2.5	<10	<10
<u>Exhaust Composition (Vol. %)</u>				
Nitrogen	73.9	74.0	74.1	73.8
Oxygen	13.5	13.8	13.4	13.7
Carbon Dioxide	3.2	3.1	4.2	4.0
Water	8.5	8.3	7.4	7.6
Other	0.9	0.8	0.9	0.9

- (1) At gas turbine exhaust plenum flange  
 (2) As measured per CE methods  
 (3) Low NOx liner

CONDITIONS:

59½F, 60% Relative Humidity  
 14.7 psia  
 Base Load  
 4.0"/2.5" Water Inlet/Exhaust Pressure Drops  
 Water Injection Schedule 498HA930  
 Steam Injection Schedule 499HA228  
 Distillate Fuel - 18550 Btu/lb (LHV)  
 Natural Gas Fuel - 21515 Btu/lb (LHV)

- \* parts per million volume dry  
 \*\* parts per million volume wet (Unburned Hydro Carbons)

**BLACK & VEATCH**  
ENGINEERS-ARCHITECTS

TEL. (913) 339-2000

1500 MEADOW LAKE PARKWAY  
MAILING ADDRESS P.O. BOX NO. 8405  
KANSAS CITY, MISSOURI 64114

Orlando Utilities Commission  
Indian River Combustion Turbine Project

B&V Project 14137  
B&V File 62.1001.02  
March 6, 1989

Orlando Utilities Commission  
7800 South U.S. 1  
Titusville, Florida 32780

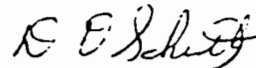
Attention: Mr. T. D. Slepow

Gentlemen:

Enclosed is the performance information that you requested from General Electric.

Very truly yours,

BLACK & VEATCH



D. D. Schultz

cac  
Enclosure

cc: Mr. J. Crall  
Mr. J. C. Davisson

IAL COMM. 8\*235-5789

DATE. FEBRUARY 28, 1989

COPIES R.P. Allen

53-200

J.E. Hopkins

53-200

DEPT. TTD

LB

ADDRESS. Building 53, Rm. 200

SUBJECT. Orlando Utilities  
DM R04002

T. Schoenholz  
53-401

The performance requested by Don Schultz is shown below.

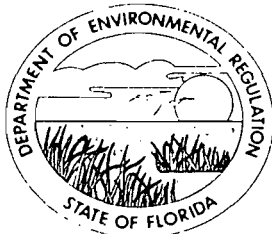
% Load	100	75	50	30
<b>Natural gas</b>				
Load KW	35460	26600	17730	10640
HC Btu/Hr x106	407.8	319.2	239.7	183.6
Nox ppmvd@15% O2	42	42	42	42
UHC ppmvw	7	2	3	3
Part lb/Hr	2.5	2.5	2.5	2.5
<b>Distillate oil</b>				
Load KW	34420	25820	17210	10330
HC Btu/Hr x106	398.9	314.2	236.7	182.6
Nox ppmvd@15% O2	65	65	65	65
UHC ppmvw	7	2	2	2
Part lb/hr	17	17	17	17

Performance at: 24ft, 90F, 60% RH, 4/2.5inch inlet/exhaust loss, with Nox control on.

If you have any further questions please call.

P. E. Garrison, Sr. Engineer  
Applications

peg



# Florida Department of Environmental Regulation

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

Bob Martinez, Governor Dale Twachtmann, Secretary John Shearer, Assistant Secretary

August 31, 1989

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. J. S. Crall  
Orlando Utilities Commission  
Post Office Box 3193  
Orlando, Florida 32802

Dear Mr. Crall:

Re: Indian River Plant Gas Turbines CT-A and CT-B  
Permit Numbers: AC 05-144482, AC 05-146749, and PSD-FL-130

The Department has reviewed your letter dated August 9, 1989, concerning the higher than expected particulate matter emissions from the above referenced units.

The Department recommends that the units be operated using natural gas so as to operate in compliance with all the emissions limitations. Should you choose to operate the turbines using fuel oil, you will need to operate at a lower firing rate so as not to exceed the permitted emission limits after the 180-day debugging period allowed for NSPS sources (counted from the date of initial start up).


OUC will need to apply for a modification of the permits to have the project reviewed for the higher particulate emissions encountered in the testing.

All compliance tests are required within 60 days after achieving maximum sustained production rate, but not later than 180 days after initial startup. Compliance with all the emission limits will be determined upon receipt of test results. Compliance with the particulate emission limits will be determined at the time the permit modification is completed if the modification application is made within 30 days of performance testing.

Mr. J. S. Crall  
Page Two  
August 31, 1989

If you have any questions, please call Pradeep Raval at (904)488-1344 or write to me at the above address.

Sincerely,



C. H. Fancy, P.E.  
Deputy Chief  
Bureau of Air Quality  
Management

CHF/PR/t

cc: J. Pennington, DARM  
C. Collins, C District  
W. Aronson, EPA  
C. Shaver, NPS  
S. Day, Black & Veatch

Reading File

Pradeep Raval

Barry Andrews

Max Linn

} 9-1-89 AM

*Certified Mail  
Green Card never  
came back*

938 762 670

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED  
NOT FOR INTERNATIONAL MAIL  
(See Reverse)

Sent to Mr. J. S. Crall	
Free Post No. Utilities Commission P.O. Box 3193 Orlando, Florida 32802	
Postage	S
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	S
Postmark or Date mailed: 9/1/89 AC 05-144482, -146749 PSD-FL-130	

PS Form 3800, June 1985



# Florida Department of Environmental Regulation

Central District • 3319 Maguire Boulevard, Suite 232 • Orlando, Florida 32803-3767 • 407-894-7555

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary  
Alex Alexander, Deputy Assistant Secretary

CERTIFIED

P35 4912893

August 21, 1989

Orlando Utilities Commission  
500 South Orange Avenue  
Post Office Box 3193  
Orlando, Florida 32802

OCD-AP-89-0574

Attn: James S. Crall, Director, Environmental Division

Brevard County - AP  
Gas Turbine Units #1 & 2  
Permit #AC05-144482, AC05-146749

RECEIVED  
AUG 24 89  
OUC-ENVD

Dear Mr. Crall:

An inspection of your gas turbines on July 25, 1989, during the initial start up/compliance testing indicated the following:

The sampling ports are located at a diverging section of the stack.

This does not satisfy the requirements of Rule 17-2.700 (4)(c)1,c,i Florida Administrative Code and specific condition number 8 of the permit.

You are now required to either relocate the ports to satisfy the above cited rule and notify the Department of the completion date, or request an alternate sampling procedure.

You must respond to these items within 10 days after receipt of this letter. If you have any questions, call Pius Sanabini at 407-894-7555 or write me.

Sincerely,

*Garry Kuberski*  
Garry Kuberski  
Air Supervisor  
Compliance/Enforcement

PS  
GDK/psl

cc: William Herrington



ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

RECEIVED  
AUG 14 1989  
DER-BAQM

August 9, 1989

Mr. C. H. Fancy, Deputy Chief  
Bureau of Air Quality Management  
Fla. Dept. of Environmental Regulations  
2600 Blairstone Road  
Tallahassee, FL 32399-2400

Re: PSD-FL-130

Dear Mr. Fancy:

Preliminary results from initial performance tests of Units 05-144482 (CT-A) and 05-146749 (CT-B) indicate they will not meet the 10 lb/hr emission rate for particulate. Our best information at present is that CT-A averaged between 15-16 lbs/hr and CT-B averaged 22-23 lbs/hr with official results forthcoming. OUC's and GE's best efforts were used to fine tune the water injection to achieve these results.

I have informally discussed this matter with Pradeep Ravel, of your office, on July 28 and on August 3, regarding how to proceed to modify the construction permit. The subject of interim operation was also discussed and it is my understanding that OUC may operate both units complying with all other limitations, without operational constraints, provided OUC requests modification of the permit within 30 days of completion of performance tests. Pradeep also suggested it would be helpful to provide documentation demonstrating that conflicting information was received from GE regarding expected particulate emissions, which I have enclosed with this transmittal.

Please confirm this information is correct and complete.

Sincerely,

James S. Crall  
Director  
Environmental Division

JSC/cs  
Enclosures

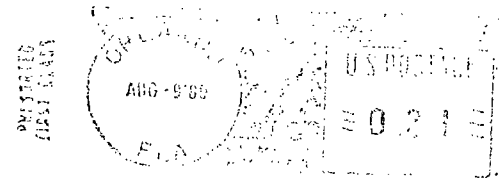
xc: W. H. Herrington w/encls.  
F. F. Haddad  
S. M. Day (B&V) w/encls.  
P. Ravel (DER)

*B. Andrews*  
*D. Anderson, EPH*  
*C. Collins, CF Dist.*  
*10/1/89*



ORLANDO UTILITIES  
COMMISSION

P. O. BOX 3193  
ORLANDO, FLORIDA 32802



Mr. C. H. Fancy, Deputy Chief  
Bureau of Air Quality Management  
Florida Department of  
Environmental Regulations  
2600 Blainstone Road  
Tallahassee, FL 32399-2400



8/23/88



**BLACK & VEATCH**

ENGINEERS-ARCHITECTS

TEL. (913) 339-2000

1500 MEADOW LAKE PARKWAY  
MAILING ADDRESS P.O. BOX NO. 8405  
KANSAS CITY, MISSOURI 64114

Orlando Utilities Commission  
Indian River Combustion Turbine Project

B&V Project 14137  
B&V File 62.1001.02  
March 6, 1989

Orlando Utilities Commission  
7800 South U.S. 1  
Titusville, Florida 32780

Attention: Mr. T. D. Slepow

Gentlemen:

Enclosed is the performance information that you requested from General Electric.

Very truly yours,

BLACK & VEATCH



D. D. Schultz

cac  
Enclosure

cc: Mr. J. Crall  
Mr. J. C. Davisson

MAIL COMM. 8\*235-5789

DATE. FEBRUARY 28, 1989

COPIES R.P. Allen  
J.E. Hopkins  
LB

53-200

53-200

DEPT. TTD

ADDRESS. Building 53, Rm. 200

SUBJECT. Orlando Utilities  
DM R04002

T. Schoenholz  
53-401

The performance requested by Don Schultz is shown below.

% Load	100	75	50	30
Natural gas				
Load KW	35460	26600	17730	10640
HC Btu/Hr x106	407.8	319.2	239.7	183.6
Nox ppmvd@15% O2	42	42	42	42
UHC ppmvw	7	2	3	3
Part lb/Hr	2.5	2.5	2.5	2.5
Distillate oil				
Load KW	34420	25820	17210	10330
HC Btu/Hr x106	398.9	314.2	236.7	182.6
Nox ppmvd@15% O2	65	65	65	65
UHC ppmvw	7	2	2	2
Part lb/hr	17	17	17	17

Performance at: 24ft, 90F, 60% RH, 4/2.5inch inlet/exhaust loss, with Nox control on.

If you have any further questions please call.



P. E. Garrison, Sr. Engineer  
Applications

peg

GENERAL  ELECTRIC

UTILITY & INDUSTRIAL SALES DIVISION  
GENERAL ELECTRIC COMPANY • POST OFFICE BOX 10577 • TAMPA, FLORIDA 33679 • (813) 873-4827

May 27, 1987

**RECEIVED**

Orlando Utilities Commission

**MAY 28**

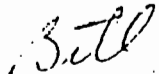
INDIAN RIVER PLANT.

Mr. Tim Slepow  
Project Engineer  
Indian River Station  
Orlando Utilities Commission  
RD #2 - Box 30  
Titusville, FL 32780

Dear Tim:

Attached is the information that you requested regarding volume of water required for water injection for the simple cycle MS-6000B gas turbine, 2½ inches back pressure ISO conditions. Additional information is included that you may find useful while talking to your environmental people. If you have any additional questions, please call.

Regards,



W. A. Smoak  
Generation Sales Engineer

WAS:sc

Attachment

MS6001B  
 Estimated Performance With Diluent Injection  
 To Meet EPA NSPS  
 (75 ppmvd NOx @ 15% O<sub>2</sub> With Heat Rate Correction)  
 2" Hga Back Pressure

	<u>Nat. Gas</u>	<u>Nat. Gas</u>	<u>Dist.</u>	<u>Dist.</u>
Output, kW	38350	38260	37980	38310
Heat Rate, Btu/kWh (LHV)	11020	10740	11210	10720
Heat Consumpt., 10 <sup>6</sup> Btu/lb (LHV)	422.6	410.9	425.8	410.7
Exhaust Flow, 10 <sup>3</sup> lb/h (1)	1090	1082.4	1097	1093.5
Exhaust Temp., F (1)	1004	1006	1004	1005
Water Flow, lb/h	8890	---	13360	---
Water/Fuel	0.44	---	0.58	---
Steam Flow, lb/h (3)	---	8500	---	17000
Steam/Fuel, (3)	---	0.44	---	0.76
CO, ppmvd*	10	10	10	10
UHC, ppmvw**	10	10	10	10
Particulates (2), lb/h	<2.5	<2.5	<10	<10

Exhaust Composition (Vol. %)

Nitrogen	73.9	74.0	74.1	73.8
Oxygen	13.5	13.8	13.4	13.7
Carbon Dioxide	3.2	3.1	4.2	4.0
Water	8.5	8.3	7.4	7.6
Other	0.9	0.8	0.9	0.9

- (1) At gas turbine exhaust plenum flange  
 (2) As measured per GE methods  
 (3) Low NOx liner

CONDITIONS:

59½F, 60% Relative Humidity  
 14.7 psia  
 Base Load  
 4.0"/2.5" Water Inlet/Exhaust Pressure Drops  
 Water Injection Schedule 498HA930  
 Steam Injection Schedule 499HA228  
 Distillate Fuel - 18550 Btu/lb (LHV)  
 Natural Gas Fuel - 21515 Btu/lb (LHV)

- \* parts per million volume dry  
 \*\* parts per million volume wet (Unburned Hydro Carbons)



ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

June 6, 1989

Mr. C. H. Fancy, P.E., Deputy Chief  
Bureau of Air Quality Management  
Florida Department of Environmental Regulations  
2600 Blairstone Road  
Tallahassee, FL 32399-2400

Re: **Indian River Plant Combustion  
Turbine Facility**

Dear Mr. Fancy:

On May 30, 1989, I gave notification that the first unit (AC-05-144482) would undergo performance testing on June 13, 1989. Please be advised that the date has been changed to June 20, 1989.

By copy of this correspondence, I am also providing notice to EPA Region IV and the DER Central Florida District Office.

If you have any questions regarding this transmittal, please contact me at (407) 423-9141.

Sincerely,

J. S. Crall  
Director  
Environmental Division

JSC/cs

xc: Winston A. Smith  
Director, Air Division  
EPA Region IV  
345 Courtland Street  
Atlanta, GA 30365

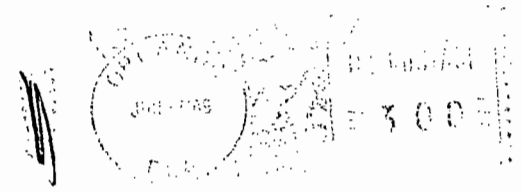
Alex Alexander  
Deputy Assistant Secretary  
FDER/CFD  
3319 Maguire Blvd.d, Suite 232  
Orlando, FL 32803

RECEIVED  
JUN 12 1989  
DER-BAQM

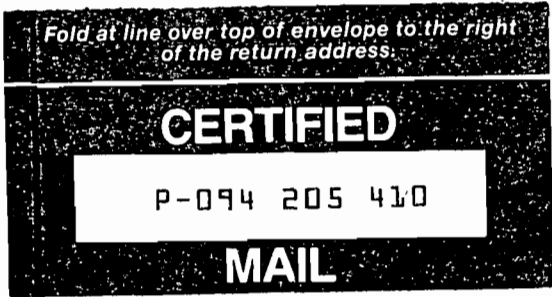


ORLANDO UTILITIES  
COMMISSION

P. O. BOX 3193  
ORLANDO, FLORIDA 32802



Mr. C. H. Fancy, P.E., Deputy Chief  
Bureau of Air Quality Management  
Florida Department of Environmental Regulations  
2600 Blairstone Road  
Tallahassee, FL 32399-2400





ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802

RECEIVED

APR 6 1989

DER-BAQM

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

April 3, 1989

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

Re: Indian River Plant Combustion  
Turbine Facility

Dear Mr. Fancy:

In accordance with specific condition 10 of PSD-FL-130 and Florida Administration Code Rule 17-2, the Orlando Utilities Commission is hereby providing notice of initial startup of the first two units of the subject phased project. Startup for the first unit (AC-05-144482) is planned for May 9, 1989, and is to be followed by startup of the second unit (AC-05-146749) on or about May 30, 1989.

Please be advised that these dates represent the best information available at this time. Notification of the actual date of initial startup for each unit will be provided by this office within fifteen (15) days thereof.

By copy of this correspondence, I am also providing notice to EPA Region IV and the DER Central Florida District Office.



ORLANDO UTILITIES  
COMMISSION

P. O. BOX 3193  
ORLANDO, FLORIDA 32802



Mr. C. H. Fancy, P. E.  
Deputy Chief  
Bureau of Air Quality Management  
Florida Department of  
Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-

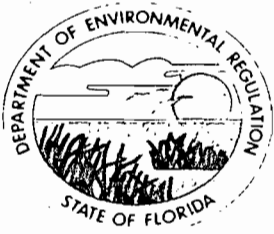
Fold at line over top of envelope to the right  
of the return address.

**CERTIFIED**

P-094 206 455

**MAIL**





# Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

March 8, 1989

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. J. S. Crall  
Orlando Utilities Commission  
Post Office Box 3193  
Orlando, Florida 32802

Dear Mr. Crall:

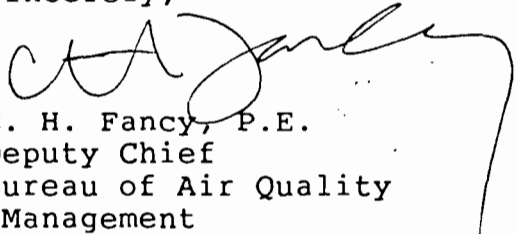
Re: Indian River Plant Combustion Turbines  
Nos. AC 05-144482, -146749, -146750, and -146751

The Department has received and reviewed your letter dated February 23, 1989, requesting approval, for compliance testing, of an oil analysis for Beryllium instead of the EPA Method 104 mentioned in Specific Condition 8 of the above referenced permits.

The Department will accept the use of either Method 7090 or 7091, and sample extraction by using Method 3040, as described in the EPA solid waste regulations, SW846.

If you have any questions, please call Pradeep Raval at (904)488-1344 or write to me at the above address.

Sincerely,

  
C. H. Fancy, P.E.  
Deputy Chief  
Bureau of Air Quality  
Management

CHF/PR/s

cc: C. Collins, CF District  
W. Aronson, EPA  
M. Flores, NPS  
S. Day, Black & Veatch

Mr. C. H. Fancy, P. E.

-2-

April 3, 1989

If you have any questions regarding this transmittal, please contact me at 407/423-9141.

Sincerely,



J. S. Crall  
Director  
Environmental Division

JSC/cs

xc: Winston A. Smith  
Director, Air Division  
EPA Region IV  
345 Courtland Street  
Atlanta, GA 30365

Alex Alexander  
Deputy Assistant Secretary  
FDER/CFD  
3319 Maguire Blvd., Suite 232  
Orlando, FL 32803

**SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.  
 Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1.  Show to whom delivered, date, and addressee's address. (Extra charge)  
 2.  Restricted Delivery. (Extra charge)

3. Article Addressed to:  
 Mr. J. S. Crall  
 Orlando Utilities Commission  
 P. O. Box 3193  
 Orlando, FL 32802

4. Article Number  
 P. 274 007 602

Type of Service:  
 Registered  Insured  
 Certified  COD  
 Express Mail  Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED

5. Signature - Address  
 X *Dunne Hugh*

6. Signature - Agent  
 X

7. Date of Delivery

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

PS Form 3811, Mar 1988 \* U.S.G.P.O. 1988-212-865 DOMESTIC RETURN RECEIPT

P 274 007 602

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED  
 NOT FOR INTERNATIONAL MAIL

(See Reverse)

\* U.S.G.P.O. 1985-480-794

Sent to Mr. J. S. Crall, OUC	
Street and No. P.O. Box 3193	
P.O., State and ZIP Code Orlando, FL 32802	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date Mailed: 3-8-89 Permit: AC 05-144482, 146749 -146750, -146751	

PS Form 3800, June 1985



file copy

RECEIVED

FEB 27 1989

ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802-3193 • 407/423-9100

February 23, 1989

Mr. Pradeep Raval  
Bureau of Air Quality Management

2600 Blair Stone Road  
Tallahassee, FL 32399-2400

Re: Indian River Plant Combustion Turbines  
Nos. 05-144482-146749, -146750 and -146751

Dear Mr. Raval:

Per conversation with Black & Beatch and Pete Burnette of Air Consulting and Engineering, I have been advised that method 104 as specified in our subject permits may not be feasible for testing combustion turbines for Beryllium. I understand that both Black & Veatch and Pete Burnette discussed the problem with you, and you advised that OUC could request an initial oil analysis for Beryllium to satisfy SP 8.f.

Please regard this correspondence as OUC's request for permission to substitute a single oil analysis in lieu of Method 104 as specified in our subject permits. We propose to use either Method 7090 or 7091, following extraction by Method 3040 as described in the Solid Waste Testing regulations, SW 846.

Thank you for your attention to this matter and please call me at 407/423-9141 if you need further information or clarification.

Sincerely,

James S. Crall  
Director  
Environmental Division

JSC/cs

xc: S.M. Day, B&V  
Copied: B. Andrews  
St. Augustine, EPA  
C. Collins, C.F. Dist  
JHF/BT

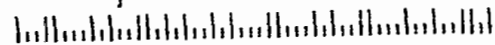


ORLANDO UTILITIES  
COMMISSION

P. O. BOX 3193  
ORLANDO, FLORIDA 32802



Mr. Pradeep Raval  
Bureau of Air Quality Management  
Florida Department of Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400



Certified P 971 547 832  
11-8-88 Orlando, FL

*file copy*



ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

CERTIFIED RETURN RECEIPT REQUESTED

November 4, 1988

RECEIVED  
NOV 10 1988  
DER-BAQM

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

Dear Mr. Fancy:

Pursuant to and in accordance with 40 CFR Part 60, Chapter 17-2 FAC and PSD-FL-130, the Orlando Utilities Commission is hereby providing notification of commence construction for two of four simple cycle combustion turbines (AC 05-144482 and AC 05-146749) on October 25, 1989 at OUC's Indian River Plant located approximately 10 km south of Titusville.

By copy of this correspondence, I am also providing notice to the DER Central District Office.

If you have any questions regarding this transmittal, please contact me at 407/423-9141.

Sincerely,

J.S. Crall  
Director  
Environmental Division

JSC:sp

xc: Alex Alexander, DER

*Copied: Pradeep Kaval  
A. Bronson, EPA  
CHF/BT*

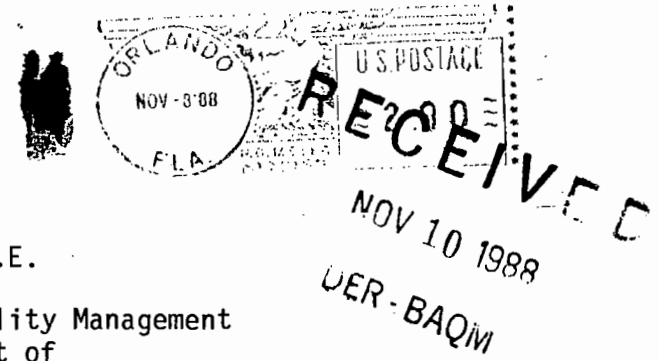


ORLANDO UTILITIES  
COMMISSION

P. O. BOX 3193  
ORLANDO, FLORIDA 32802

CERTIFIED RETURN RECEIPT REQUESTED

Mr. C.H. Fancy, P.E.  
Deputy Chief  
Bureau of Air Quality Management  
Florida Department of  
Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 323



*Fold at line over top of envelope to the right  
of the return address.*

**CERTIFIED**

P 971 587 832

**MAIL**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET  
ATLANTA, GEORGIA 30365

OCT 11 1988

4APT/APB-aes

Mr. C. H. Fancy, Deputy Chief  
Bureau of Air Quality Management  
Florida Department of Environmental Regulation  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

RECEIVED

OCT 14 1988

DER-BAQM

Re: Orlando Utilities Commission (PSD-FL-130)

Dear Mr. Fancy:

We have reviewed the final determination and final permit for the proposed construction of four simple cycle combustion turbines at the Indian River Plant. We concur with Florida's evaluation of this project.

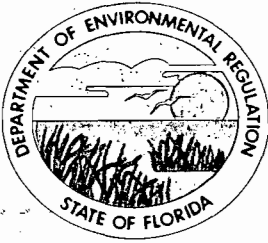
Sincerely yours,

A handwritten signature in cursive script that reads "Bruce P. Miller".

Bruce P. Miller, Chief  
Air Programs Branch  
Air, Pesticides, and Toxics  
Management Division

cc: Orlando Utilities Commission  
500 South Orange Avenue  
P.O. Box 3193  
Orlando, Florida 32802





# Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION  
NOTICE OF PERMIT

Mr. William Herrington  
Orlando Utilities Commission  
500 South Orange Avenue  
Orlando, Florida 32802

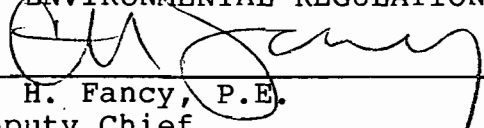
September 1, 1988

Enclosed are permits Nos. AC 05-144482, -146749, -146750, and -146751, for Orlando Utilities Commission to construct four new simple cycle combustion turbines at the existing Indian River Plant, Brevard County, Florida. These permits are issued pursuant to Section 403, Florida Statutes.

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

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL REGULATION

  
\_\_\_\_\_  
C. H. Fancy, P.E.  
Deputy Chief  
Bureau of Air Quality Management

Copy furnished to:

C. Collins, CF District  
W. Aronson, EPA  
M. Flores, NPS  
J. Crall, OUC  
S. Day, Black & Veatch

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on September 2, 1988.

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

Martha J. Wise      September 2, 1988  
Clerk                              Date

● **SENDER:** Complete Items 1 and 2 when additional services are desired, and complete Items 3 and 4.  
 Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1.  Show to whom delivered, date, and addressee's address.  Restricted Delivery  
 ↑ (Extra charge) ↑

<b>3. Article Addressed to:</b> Mr. William Herrington Orlando Utilities Commission 500 South Orange Avenue Orlando, FL 32802	<b>4. Article Number:</b> P. 938 762 891 <b>Type of Service:</b> <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail Always obtain signature of addressee or agent and <b>DATE DELIVERED</b>
<b>5. Signature - Addressee</b> <input checked="" type="checkbox"/> <i>Mar 11/88</i> <b>6. Signature - Agent</b> <input checked="" type="checkbox"/> <b>7. Date of Delivery</b> <b>SEP 7 1988</b>	<b>8. Addressee's Address (ONLY if requested and fee paid)</b>

PS Form 3811, Mar. 1987    \* U.S.G.P.O. 1987-178-268    **DOMESTIC RETURN RECEIPT**

To \_\_\_\_\_  
 Date Attachment for  
**W** Orlando Utilities  
 M \_\_\_\_\_  
 of \_\_\_\_\_ Kim has letter.  
 Phone \_\_\_\_\_ Orig. - Certified  
                   { Jim Crall - Fed Exp.  
                   { His copy  
                   Tom Sawicki - copy

TE  
 CA  
 W/

Message 1089-9928-4  
Orlando Utilities  
1089-9928-4 Fuel X

Operator \_\_\_\_\_

P 938 762 891

**RECEIPT FOR CERTIFIED MAIL**  
 NO INSURANCE COVERAGE PROVIDED  
 NOT FOR INTERNATIONAL MAIL  
 (See Reverse)

Sent to <u>Mr. William Herrington</u>	
<u>Orlando Utilities Commission</u>	
Street and No. <u>500 South Orange Avenue</u>	
P.O., State and ZIP Code <u>Orlando, FL 32802</u>	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Mailed date <u>09/02/88</u>	
PERMITS: <u>AC 05-144482,</u> <u>-146749, -146750 &amp; -146751</u>	

PS Form 3800, June 1985

Final Determination

Orlando Utilities Commission  
Indian River Plant  
Titusville, Brevard County, Florida

Combustion Turbine Facility  
Permit Numbers:

Unit 1, AC 05-144482  
Unit 2, AC 05-146749  
Unit 3, AC 05-146750  
Unit 4, AC 05-146751

PSD-FL-130

Florida Department of Environmental Regulation  
Bureau of Air Quality Management  
Central Air Permitting

August 31, 1988

## Final Determination

Orlando Utilities Commission's applications to construct four new simple cycle combustion turbines at the existing Indian River Plant, Brevard County, Florida, have been reviewed by the Bureau of Air Quality Management. Public Notice of the Department's Intent to Issue the permits was published in the Florida Today Newspaper on July 21, 1988.

Comments received from Orlando Utilities (see Attachment 13) in response to the Department's Intent to Issue are addressed below.

1. The introductory paragraph on the first page of the proposed permit will be amended to reflect that natural gas will be the primary fuel and that distillate oil will be used during periods of curtailed or uneconomical natural gas supply.
2. Specific Condition No. 2 will be clarified by deleting the second sentence.
3. Specific Condition No. 3 will be corrected to reflect the maximum heat input of 445 MMBtu/hr at sea level and 59°F. For compliance purposes, the applicant has provided performance data for the GE Frame 6 turbine showing the variation in heat input with variation in ambient temperature. A plot of temperature vs emissions will be submitted by the applicant to the DER district office prior to applying for the operation permit.
4. The reference of 59°F and sea level will be added to Specific Conditions No. 3 and 4.
5. Specific Condition No. 8, pertaining to testing requirements, will be amended as requested by the applicant.
6. Specific Condition No. 12 will be restated as requested by the applicant based on the revised start date for unit 4.

In consideration of comments from the Central Air Permitting Staff, Specific Condition No. 10 will be amended to make the wording consistent with recently issued permits.

The final action of the Department will be to issue the permits as proposed with the above mentioned changes to Specific Conditions Nos. 2, 3, 4, 8, 10, and 12.

CAPE PUBLICATIONS, INC.

The Times

Published Weekly on Wednesday

THE TRIBUNE

Published Weekly on Wednesday

STAR-ADVOCATE

Published Weekly on Wednesday



Published Daily

STATE OF FLORIDA
COUNTY OF BREVARD

Before the undersigned authority personally appeared Linda L. Spicer who on oath says that he/she is Legal Advertising Clerk of the FLORIDA TODAY, a newspaper published in Brevard County, Florida; that the attached copy of advertising being a Legal Notice of Intent

in the matter of State of Florida Dept. of Environmental Regulation

in the Court

was published in the FLORIDA TODAY NEWSPAPER in the issues of July 21, 1988

Affiant further says that the said FLORIDA TODAY NEWSPAPER is a newspaper published in said Brevard County, Florida and that the said newspaper has heretofore been continuously published in said Brevard County, Florida regularly as stated above, and has been entered as second class mail matter at the post office in COCOA, said Brevard County, Florida for a period of one year next preceeding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in said newspaper.

Linda L. Spicer
Sworn and subscribed to before me this

21st day of July A.D., 1988

Cathy L. Smith
Notary Public
State of Florida at Largo
My Commission Expires March 29, 1992



State of Florida
Department of
Environmental Regulation
Notice of Intent
The Department of Environmental Regulation hereby gives notice of its intent to issue permits to Orlando Utilities Commission to construct four new simple cycle combustion turbines, each with an electrical generation capacity of about 35 MW, at the existing Indian River Plant, Brevard County, Florida. The Department is issuing this intent to issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative determination (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Failure to file a petition within this time period constitutes a waiver of any right such person has to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the proposed agency action. Therefore, persons who may not wish to file a petition may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Rule 28-5.207, Florida Administrative Code, at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2007 Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

The applications are 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 Regulation

Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dept. of Environmental Regulation
Central Florida District
3319 Mapule Blvd., Suite 232
Orlando, Florida 32803-3767

Any person may send written comments on the proposed action to Mr. Bill Thomas at the department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the department's final determination.
(904) 917-7721
Thursday



# Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

**PERMITTEE:**  
Orlando Utilities Commission  
500 South Orange Avenue  
Orlando, Florida 32802

**Permit Numbers:** AC 05-144482  
05-146749  
05-146750  
05-146751

**Expiration Date:** January 31, 1992

**County:** Brevard

**Latitude/Longitude:** 28° 29' 32"N  
80° 46' 59"W

**Project:** Combustion Turbine  
Facility Units 1, 2, 3, & 4

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

For the construction of four simple cycle GE Frame 6 combustion turbines, each with about 35 MW capacity, at the existing Indian River Plant, Brevard County, Florida. The turbines will primarily fire natural gas. Distillate oil will be fired during periods of curtailed or uneconomical natural gas supply. Nitrogen oxide emissions will be controlled by water injection. The PSD permit number for this project is PSD-FL-130.

Construction shall be in accordance with the permit application and plans, documents, and reference material submitted unless otherwise stated in the Preliminary Determination and Technical Evaluation or the General and Specific Conditions herein.

#### Attachments:

1. OUC's application package dated January 18, 1988.
2. DER's letter concerning application fees dated February 15, 1988.
3. DER's letter for additional information dated March 10, 1988.
4. DER's letter containing EPA's comments dated March 18, 1988.
5. OUC's letter received April 18, 1988.
6. Black & Veatch (B & V) letter received May 5, 1988.
7. OUC letter received May 13, 1988.
8. B & V letter received May 18, 1988.
9. B & V letter received June 13, 1988.
10. B & V letter received June 16, 1988.
11. B & V letter received June 21, 1988.
12. Fish & Wildlife Service letter received July 5, 1988.
13. OUC's comments received August 18, 1988.
14. Preliminary and Final Determinations dated July 15 and August 26, 1988, respectively.

PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Expiration Date: January 31, 1992

**GENERAL CONDITIONS:**

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.



PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Expiration Date: January 31, 1992

GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

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

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

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

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

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

PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Expiration Date: January 31, 1992

GENERAL CONDITIONS:

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

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

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

- (x) Determination of Best Available Control Technology (BACT)
- (x) Determination of Prevention of Significant Deterioration (PSD)
- (x) Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

- a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Expiration Date: January 31, 1992

**GENERAL CONDITIONS:**

- b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.
- c. Records of monitoring information shall include:
- the date, exact place, and time of sampling or measurements;
  - the person responsible for performing the sampling or measurements;
  - the date(s) analyses were performed;
  - the person responsible for performing the analyses;
  - the analytical techniques or methods used; and
  - the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

**SPECIFIC CONDITIONS:**

1. Each turbine may operate continuously (8760 hours/year).
2. Only natural gas or distillate oil shall be fired in the turbine.
3. The maximum heat input to each turbine shall not exceed 445 MMBtu/hr, at sea level and 59°F (see Attachment 13 for a plot of heat input vs temperature).

PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751  
Expiration Date: January 31, 1992

SPECIFIC CONDITIONS:

4. The maximum allowable emissions from the turbine(s) in accordance with the BACT determination, shall not exceed the following, at sea level and 59°F:

Pollutant	Fuel	Maximum Emissions	Potential Annual Emissions	
		Per Unit lb/h	1 Unit t/yr	4 Units t/yr
Carbon Monoxide	Gas	10.0	43.8	175
	Oil	10.1	44.2	177
Nitrogen Oxides	Gas	75.1	328.9	1,316
	Oil	118.3	518.2	2,073
Sulfur Dioxide	Gas	0.34	1.5	6
	Oil	142.7	625.0	2,500
Total Particulates	Gas	2.5	11.0	44
	Oil	10.0	43.8	175
PM <sub>10</sub>	Gas	2.5	11.0	44
	Oil	10.0	43.8	175
VOC	Gas	4.0	17.5	70
	Oil	4.0	17.5	70
Sulfuric Acid Mist	Oil	10.0	44.0	176
Beryllium	Oil	0.0001	0.0005	0.0018

Visible emissions shall not exceed 5% opacity while burning natural gas or 10% opacity while burning distillate oil.

5. The distillate oil sulfur content shall not exceed 0.3% by weight.

6. Water injection shall be utilized for NOx control. The water to fuel ratio at which compliance is achieved shall be incorporated into the permit, and shall be monitored.

PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Expiration Date: January 31, 1992

SPECIFIC CONDITIONS:

7. Both start and black start capability shall be provided by a No. 2 fuel oil fired 800 HP internal combustion diesel (for each turbine), projected to run for approximately 10 minutes per start. These diesels are expected to emit minimal air emissions (15 lbs SO<sub>2</sub>/year/unit).

8. Initial (I) compliance tests shall be performed using both fuels. Annual (A) compliance tests shall be performed with the fuel(s) used for more than 170 hours in the preceding 12 month period. Tests shall be conducted using EPA methods in accordance with 40 CFR 60 Appendix A, 1987 Edition:

- a. 20 for NO<sub>x</sub> (I,A)
- b. ASTM D 2880-71 for sulfur content of distillate oil, and ASTM D 1072-80, D 3031-81, D 4084-82 or D 3246-81 for sulfur content of natural gas (I, and A if deemed necessary by DER)
- c. 10 for CO (I)
- d. 5 for PM (I, for distillate oil only)
- e. 9 for VE (I,A)
- f. 104 for Beryllium (I, for distillate oil only)

Test for PM, Be, and SO<sub>2</sub> are to be conducted for oil only. Compliance with SO<sub>2</sub> limits may be demonstrated by testing all oil shipments for sulfur content less than 0.30 percent using ASTM D2880-71.

Any unit which has accumulated 170 hours burning fuel oil during the preceding 12 month period shall conduct an annual test using fuel oil.

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

9. The project shall comply with all the applicable requirements of Chapter 17-2, Florida Administrative Code and 40 CFR 60 Subpart GG, Gas Turbines.

10. DER's Central Florida District Office shall be notified in writing a minimum of 15 days prior to source testing. Written reports of the tests shall be submitted to the DER district office within 30 days of test completion.

PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Expiration Date: January 31, 1992

**SPECIFIC CONDITIONS:**

The construction shall reasonably conform to the plans and schedule submitted in the application. If the permittee is unable to complete construction on schedule, the Department must be notified in writing a minimum of 60 days prior to the expiration of the construction permit and submit a new schedule and request for an extension of the construction permit, (Rule 17-2, FAC).

To obtain a permit to operate, the permittee must demonstrate compliance with the conditions of the construction permit and submit a complete application for an operating permit, including the application fee, along with compliance test results and Certificate of Completion, to the DER district office a minimum of 90 days prior to the expiration date of the construction permit. The permittee may continue to operate in compliance with all terms of the construction permit until its expiration date. Operation beyond the construction permit expiration date requires a valid permit to operate (Rules 17-2 and 17-4, FAC).

If the construction permit expires prior to the permittee requesting an extension or obtaining a permit to operate, then all activities at the project must cease and the permittee must apply for a new permit to construct which can take up to 90 days to process a complete application (Rule 17-4, FAC).

11. Any change in the method of operation, fuels, equipment or operating hours shall be submitted for approval to the DER district office.

12. If construction does not commence on all four units within 18 months of issuance of this permit, then the permittee shall obtain from DER a review and, if necessary, a modification of the control technology and allowable emissions for the unit(s) on which construction has not commenced (40 CFR 52.21(r)(2)). The proposed schedule indicates construction commencement dates of October 1988 for units 1 and 2, and November 1989 for units 3 and 4.

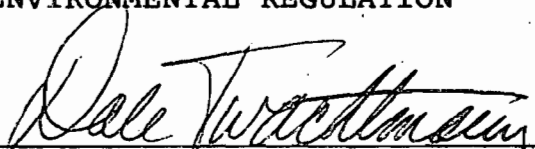
PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
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05-146751

Expiration Date: January 31, 1992

Issued this 1 day of Sept., 1988

STATE OF FLORIDA DEPARTMENT OF  
ENVIRONMENTAL REGULATION

  
Dale Twachtman, Secretary

Best Available Control Technology (BACT) Determination  
Orlando Utilities Commission  
Brevard County

The applicant proposes to install up to four new simple cycle combustion turbines at the Indian River Plant located about 10 km south of Titusville, Florida. The project includes the installation of two 35 MW (approximate rating at site conditions) combustion turbine generators, with provisions for the installation of up to two additional combustion turbine generators of similar size in the future. This application was reviewed for the total proposed installation of four 35 MW units.

The combustion turbines are being designed for firing on either natural gas or No. 2 fuel oil. The applicant has indicated the annual tonnage of regulated air pollutants emitted from the four turbines based on 100 percent capacity and type of fuel firing to be as follows:

Pollutant	Maximum Potential Emissions (tons/year)		PSD Significant Emission Rate (tons/year)
	Natural Gas	Diesel Fuel	
NOx	1,320	2,070	40
SO <sub>2</sub>	6	2,500	40
PM	44	175	25
PM <sub>10</sub>	44	175	15
CO	175	177	100
VOC	70	70	40
Sulfuric Acid Mist	-	176	7
Beryllium	-	0.0018	0.0004

Florida Administrative Code Rule 17-2.500(2)(f)(3) requires a BACT review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in the previous table.

BACT Determination Requested by the Applicant

The BACT determinations requested by the applicant on a pollutant by pollutant basis are given below:



<u>Pollutant</u>	<u>Determination</u>
NO <sub>x</sub>	42 ppmvd @ 15% O <sub>2</sub> (natural gas firing) 65 ppmvd @ 15% O <sub>2</sub> (diesel oil firing)
SO <sub>2</sub>	Low sulfur fuel (natural gas, diesel fuel with sulfur content not to exceed 0.30%)
PM and PM <sub>10</sub>	Firing of natural gas and diesel oil
CO	10 ppmvd @ 15% O <sub>2</sub>
VOC	7 ppmvd @ 15% O <sub>2</sub>
Sulfuric Acid Mist	Firing of natural gas and diesel oil
Beryllium	Firing of natural gas and diesel oil

Date of Receipt of a BACT application:

May 5, 1988

Review of Group Members:

This determination was based upon comments received from the applicant, EPA Region IV, and the Stationary Source Control Section.

BACT Determination Procedure:

In accordance with Florida Administrative Code Chapter 17-2, Air Pollution, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department (DER), on a case-by-case basis taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that in making the BACT determination the Department shall give consideration to:

- (a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).
- (b) All scientific, engineering, and technical material and other information available to the Department.

- (c) The emission limiting standards or BACT determinations of any other state.
- (d) The social and economic impact of the application of such technology.

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

BACT Determined by DER:

Pollutant	Emission Limit
NOx	42 ppmvd @ 15% O <sub>2</sub> (natural gas firing) 65 ppmvd @ 15% O <sub>2</sub> (natural gas firing)
SO <sub>2</sub>	Emissions limited by natural gas and diesel oil firing (sulfur content not to exceed 0.30%)
PM & PM <sub>10</sub>	Emissions limited by natural gas and diesel oil firing (sulfur content not to exceed 0.30%)
CO	10 ppmvd @ 15% O <sub>2</sub>
VOC	7 ppmvd @ 15% O <sub>2</sub>
Sulfuric Acid Mist	Emissions limited by natural gas and diesel oil firing
Beryllium	Emissions limited by natural gas and diesel oil firing

BACT Determination Rationale

The Department has determined that the application as submitted represents BACT for this facility. In accordance with the "top down" BACT approach, an economic analysis has indicated that the control measures which are available to provide the highest emissions reductions are prohibitively expensive and thereby are

not justified as BACT. These control options are investigated on a pollutant-by-pollutant basis as follows.

The applicant has stated that BACT for nitrogen oxides will be met by using water or steam injection necessary to limit emissions to 65 ppmvd or 42 ppmvd at 15 percent oxygen when burning distillate fuel or natural gas, respectively.

A review of the EPA's BACT/LAER Clearinghouse - A Compilation of Control Technology Determinations (1985 edition) and its May 1986 and 1987 supplements indicates that the lowest NO<sub>x</sub> emission limit established to date for a combustion turbine is 4.5 ppmvd at 15 percent oxygen. This level of control was accomplished through the use of water injection and a selective catalytic reduction (SCR) system.

Selective catalytic reduction is a post-combustion method for control of NO<sub>x</sub> emissions. The SCR process combines vaporized ammonia with NO<sub>x</sub> in the presence of a catalyst to form nitrogen and water. The vaporized ammonia is injected into the exhaust gases prior to passage through the catalyst bed. The SCR process can achieve up to 90 percent reduction of NO<sub>x</sub> with a new catalyst. As the catalyst ages, the maximum NO<sub>x</sub> reduction will decrease to approximately 86 percent.

In order to justify the cost effectiveness of any air pollution control, the EPA has developed costing guidelines to obtain the highest reduction of emissions per dollar invested. Achievement of maximum emission reductions for capital invested is a major consideration when New Source Performance Standards (NSPS) are developed by the EPA. For NO<sub>x</sub> emissions, EPA has determined that a cost of up to \$1,000 per ton of emissions controlled (\$0.50/lb) is reasonable for NSPS. The cost guideline can be used as a screening technique for justifying BACT since federal regulations require that BACT determinations be at least as stringent as NSPS.

The applicant has stated that the installation and operation a SCR system designed to reduce post-combustion emissions by 86 percent would result in an annualized cost of approximately \$4.4 million. Based on continuous full load operation, the amount of NO<sub>x</sub> reduction achieved by the SCR system would be a maximum of 1,780 tons per year (emissions based on oil firing). Taking this reduction into consideration with the annualized cost of \$4.4 million, the cost per ton of NO<sub>x</sub> controlled is approximately \$2,472. This cost is well above the \$1,000 per ton guideline and does not appear to be reasonable as BACT.

For sulfur dioxide emissions, a review of the BACT/LAER Clearinghouse indicates that BACT has been represented by the firing of low sulfur content fuel. These sulfur content

limitations are typical for the firing of fuel oil only, since the sulfur content of natural gas is inherently very low.

As part of the "top down" BACT process the applicant has completed an economic analysis of using a flue gas desulfurization (FGD) system which would provide the maximum possible level of control for SO<sub>2</sub> even though it has not been a BACT requirement previously. According to the applicant, the annualized cost of a wet limestone (FGD) system which is capable of reducing SO<sub>2</sub> emissions by 70 percent would be approximately \$11.8 million. Based on continuous full load operation, the amount of SO<sub>2</sub> reduction achieved by the FGD system would be a maximum of 1,750 tons per year for oil fuel operation. In addition to the SO<sub>2</sub> control, a FGD system would also provide control for the pollutants beryllium and sulfuric acid mist, which require BACT for this facility, and several other pollutants. These pollutants have been identified as being emitted from gas/oil fired turbines as contained in the EPA publications entitled, "Compiling Air Toxics Emission Inventories" and "Control Technologies for Hazardous Air Pollutants."

The total tonnage of pollutants which would be controlled by the FGD system amount to approximately 1,905 tons per year for oil fired operation. Taking this reduction in consideration with the annualized cost of \$11.8 million the cost per ton of pollutants controlled is approximately \$6,194. This cost is well above the \$2,000 per ton guideline (NSPS guideline for SO<sub>2</sub> emissions) and does not appear to be reasonable as BACT.

As the BACT alternative for SO<sub>2</sub> emissions, the applicant has proposed to use fuel oil with a sulfur limitation of 0.30 percent. Limiting the oil's sulfur content is the common method of establishing BACT for SO<sub>2</sub> emissions from oil fired turbines.

The BACT/LAER Clearinghouse lists sulfur content limitations for burning oil in turbines that range from 0.1 to 0.5 percent. The applicants request that the turbine be allowed to burn fuel oil with a sulfur content of 0.30 percent maximum is consistent with the majority of the sulfur content limitations, and is thereby judged to be reasonable for BACT.

With regard to the pollutants carbon monoxide, volatile organic compounds and particulate matter, the BACT/LAER Clearinghouse documents do not list any combustion turbine projects with more stringent emission requirements than what has been proposed by the applicant.

The emissions of CO, VOC and PM are minimized by ensuring as complete combustion as possible. The equipment manufacturer has guaranteed that the CO and VOC emissions will not exceed 10 ppmvd and 7 ppmvd at 15 percent oxygen, respectively. These levels are consistent with previous BACT determinations and are judged to

represent BACT for this facility. These good combustion practices will also ensure that the toxic organic compounds will be minimized.

The emissions of particulates (TSP and PM<sub>10</sub>) will be minimized by the inherent qualities of the fuel. Both natural gas and distillate oil contain only trace quantities of particulate. As is the case, BACT for particulates is satisfied by the use of these fuels in the combustion turbine.

Dispersion modeling indicates that the maximum predicted impacts from the facility with the level of control proposed by the applicant will be well below the Ambient Air Quality Standards for all of the averaging periods. As is the case, the impacts associated with firing either natural gas or distillate fuel in the combustion turbines are not perceived to be a threat to air quality.

### Conclusion

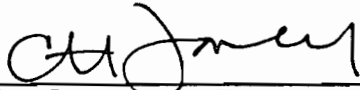
The Department has determined that the level of control proposed by the applicant for the gas turbine facility represents BACT in all cases. The "top down" BACT approach has indicated that the more efficient than proposed control measures are too costly to warrant as being BACT for this facility. The control level as proposed is as efficient as any previous controls required for gas/oil fired turbines with the exception of units in California which were required to utilize selective catalytic reduction. Although additional NO<sub>x</sub> control could be achieved by further increasing the water/steam injection rate, it has been demonstrated that higher than proposed levels would be detrimental to the combustor and are not appropriate. In addition it should be noted that the maximum emission rates and the economic analysis have been based on operating the turbines with distillate oil as the combustion fuel. It is anticipated that natural gas will be the primary fuel, thereby resulting in actual emissions rates which are well below the maximum projections.

### Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator  
Department of Environmental Regulation  
Bureau of Air Quality Management  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

(Orlando Utilities Commission)

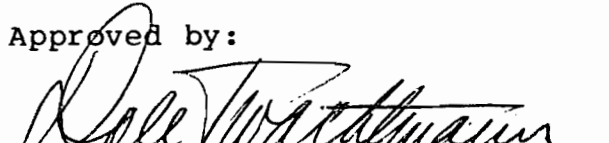
Recommended by:



C.H. Fancy, P.E.  
Deputy Bureau Chief, BAQM

31 AUG 1988  
Date

Approved by:

  
Dale Twachtmann, Secretary

1 Sept 1988  
Date

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**ORLANDO UTILITIES COMMISSION**

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 305/423-9100  
CERTIFIED RETURN RECEIPT REQUESTED

August 17, 1988

Florida Department of  
Environmental Regulation  
Bureau of Air Quality Management  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400  
ATTN: Mr. Bill Thomas

**RECEIVED**

**AUG 22 1988**

**DER-BAQM**

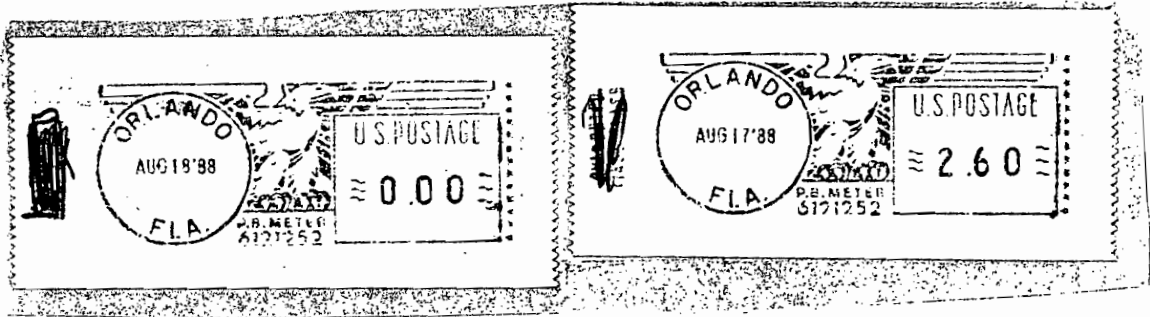
Dear Mr. Thomas:

We appreciate your continuing efforts in the processing of our PSD permit application for the four unit combustion turbine project at the Indian River Plant, Brevard County, Florida.

We would like to present the following comments on four of the specific conditions contained in the proposed permit, attached to your letter of July 18.

Specific Condition 3 incorrectly specifies the maximum heat input. Each turbine is baseload rated at 445 Million BTU/hr (not 112) on oil at sea level and 59° F as specified in Section III E of the application. As you are aware, the ambient temperature affects the capacity of combustion turbines with lower temperatures serving to increase their maximum heat input firing rate. The amount of water required for NO<sub>x</sub> control also affects turbine performance. The enclosed two figures of heat input vs. temperature provide the range of heat input values expected for the GE frame 6 turbine for oil and natural gas. The center line on each figure is the rated baseload curve with maximum water injection. The top line represents the peak load values which could be sustained for only short periods of time without extensive maintenance. This line has also been adjusted to represent the higher heating value of the fuel (HHV). The bottom line represents the baseload condition with no water injection and is adjusted to represent the lower heating value of the fuel (LHV). Thus the figures provide the "normal" maximum capability vs. temperature and the range around that value. Based on the preceding discussion, Condition 3 should read, "The maximum heat input to each turbine shall not exceed the maximum values in the attached Figures of Heat Input vs. Temperature for the OUC Indian River Combustion Turbines." OUC is also providing copies of various GE correction charts and letter of expected performance which were used to develop the two Figures.

Specific condition 12 is currently incorrect as written since the proposed Unit 3 commence construction date is within 18 months of



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of the return address.*

**CERTIFIED**

P 744 170 244

**MAIL**



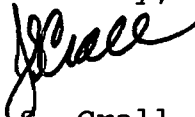
the permit issuance date. We are hereby notifying you our intent to change the proposed commence construction date of Unit 4 from November 1990 to November 1989 so that it too will fall within 18 months of the permit issuance date. Our proposed new specific condition 12 would read "If construction does not commence on any of the four units within 18 months of the date of this permit issuance, then the permittee shall obtain from the Department a review and, if necessary, a modification of the control technology and allowable emission limits for any such unit. The proposed schedule indicates construction commencement dates of October 1988 for Units 1 & 2, and November 1989 for Units 3 & 4."

We are concerned that Specific Condition 2 could be read to imply a limitation with regard to the combustion of oil. This would be inconsistent with the permit application and the Department's BACT analysis. We have been assured by DER staff that this is not the Department's intent. Rather, the intent was to include in the permit the Department's preference that natural gas be burned if available. We are suggesting that the second sentence in Specific Condition 2 be moved to the second paragraph of the permit on page one following the second sentence in the paragraph to read "Natural gas is the expected primary fuel with distillate oil to be used if the units are needed during periods of curtailed or uneconomical natural gas supply."

Specific Condition B specifies the initial and annual compliance tests to be conducted. We would like to see the requirement to test annually on oil be limited to any unit burning fuel oil more than 170 hours in the preceding 12 month period. It would require 170 hours/year of operation on oil to create 40 tons of NO<sub>x</sub> from oil combustion. This would allow OUC to avoid firing the units on oil to do testing when the units have been used only slightly on oil. For item (a), under Specific Condition 12, we agree with the use of EPA test method 20 for NO<sub>x</sub>. For SO<sub>2</sub>, we propose testing all oil shipments using ASTM D2880-71 for sulfur content less than 0.30 percent as a demonstration of compliance rather than stack testing. We propose that no SO<sub>2</sub> testing be conducted for natural gas because of the very low emission rates. For item (c) we propose testing for particulate matter on oil only since particulate emissions from the combustion of natural gas are also minimal.

We appreciate your attention to these matters.

Sincerely,



J.S. Crall  
Director  
Environmental Division

JSC:sp

Enclosure

xc: W.H. Herrington

F.F. Haddad

K.P. Ksionek

T.D. Slepov

S.M. Day, B&V

Pradeep A. Raval, DER

*Copied: Chuck Collins, CF Dist  
Barry Andrews  
Map Linn*

*Stacyne Brown, EPA  
Michael S. Jones, NPS  
CHF/BT*

8-17-88  
Orlando, FL



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## ORLANDO UTILITIES COMMISSION

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CERTIFIED RETURN RECEIPT REQUESTED

August 17, 1988

RECEIVED

AUG 18 1988

DER-BAQM

Florida Department of  
Environmental Regulation  
Bureau of Air Quality Management  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400  
ATTN: Mr. Bill Thomas

Dear Mr. Thomas:

We appreciate your continuing efforts in the processing of our PSD permit application for the four unit combustion turbine project at the Indian River Plant, Brevard County, Florida.

We would like to present the following comments on four of the specific conditions contained in the proposed permit attached to your letter of July 18.

Specific Condition 3 incorrectly specifies the maximum heat input. Each turbine is baseload rated at 445 Million BTU/hr (not 112) on oil at sea level and 59° F as specified in Section III E of the application. As you are aware, the ambient temperature affects the capacity of combustion turbines with lower temperatures serving to increase their maximum heat input firing rate. The amount of water required for NO<sub>x</sub> control also affects turbine performance. The enclosed two figures of heat input vs. temperature provide the range of heat input values expected for the GE frame 6 turbine for oil and natural gas. The center line on each figure is the rated baseload curve with maximum water injection. The top line represents the peak load values which could be sustained for only short periods of time without extensive maintenance. This line has also been adjusted to represent the higher heating value of the fuel (HHV). The bottom line represents the baseload condition with no water injection and is adjusted to represent the lower heating value of the fuel (LHV). Thus the figures provide the "normal" maximum capability vs. temperature and the range around that value. Based on the preceding discussion, Condition 3 should read, "The maximum heat input to each turbine shall not exceed the maximum values in the attached Figures of Heat Input vs. Temperature for the OUC Indian River Combustion Turbines." OUC is also providing copies of various GE correction charts and letter of expected performance which were used to develop the two Figures.

Specific condition 12 is currently incorrect as written since the proposed Unit 3 commence construction date is within 18 months of

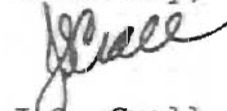
the permit issuance date. We are hereby notifying you our intent to change the proposed commence construction date of Unit 4 from November 1990 to November 1989 so that it too will fall within 18 months of the permit issuance date. Our proposed new specific condition 12 would read "If construction does not commence on any of the four units within 18 months of the date of this permit issuance, then the permittee shall obtain from the Department a review and, if necessary, a modification of the control technology and allowable emission limits for any such unit. The proposed schedule indicates construction commencement dates of October 1988 for Units 1 & 2, and November 1989 for Units 3 & 4."

We are concerned that Specific Condition 2 could be read to imply a limitation with regard to the combustion of oil. This would be inconsistent with the permit application and the Department's BACT analysis. We have been assured by DER staff that this is not the Department's intent. Rather, the intent was to include in the permit the Department's preference that natural gas be burned if available. We are suggesting that the second sentence in Specific Condition 2 be moved to the second paragraph of the permit on page one following the second sentence in the paragraph to read "Natural gas is the expected primary fuel with distillate oil to be used if the units are needed during periods of curtailed or uneconomical natural gas supply."

Specific Condition B specifies the initial and annual compliance tests to be conducted. We would like to see the requirement to test annually on oil be limited to any unit burning fuel oil more than 170 hours in the preceding 12 month period. It would require 170 hours/year of operation on oil to create 40 tons of NO<sub>x</sub> from oil combustion. This would allow OUC to avoid firing the units on oil to do testing when the units have been used only slightly on oil. For item (a), under Specific Condition 12, we agree with the use of EPA test method 20 for NO<sub>x</sub>. For SO<sub>2</sub>, we propose testing all oil shipments using ASTM D2880-71 for sulfur content less than 0.30 percent as a demonstration of compliance rather than stack testing. We propose that no SO<sub>2</sub> testing be conducted for natural gas because of the very low emission rates. For item (c) we propose testing for particulate matter on oil only since particulate emissions from the combustion of natural gas are also minimal.

We appreciate your attention to these matters.

Sincerely,



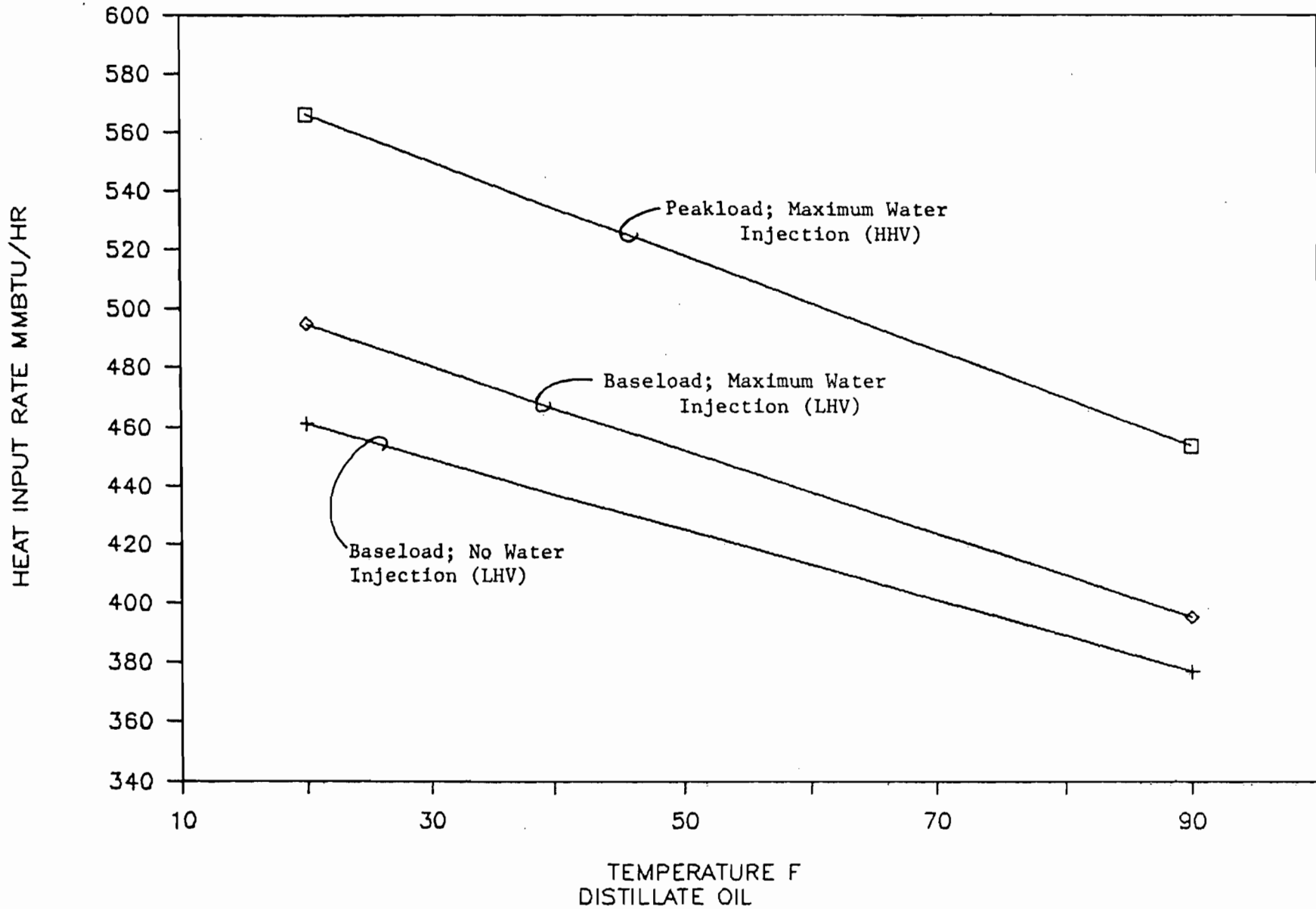
J.S. Crall  
Director  
Environmental Division

JSC:sp  
Enclosure  
xc: W.H. Herrington  
F.F. Haddad  
K.P. Ksionek  
T.D. Slepov  
S.M. Day, B&V  
Pradeep A. Raval, DER

copied: *Max Linn*  
*Barry Andrews*  
*Chuck Collins, CF Dist*  
*Wayne Bronson, EPA*  
CHF/BT

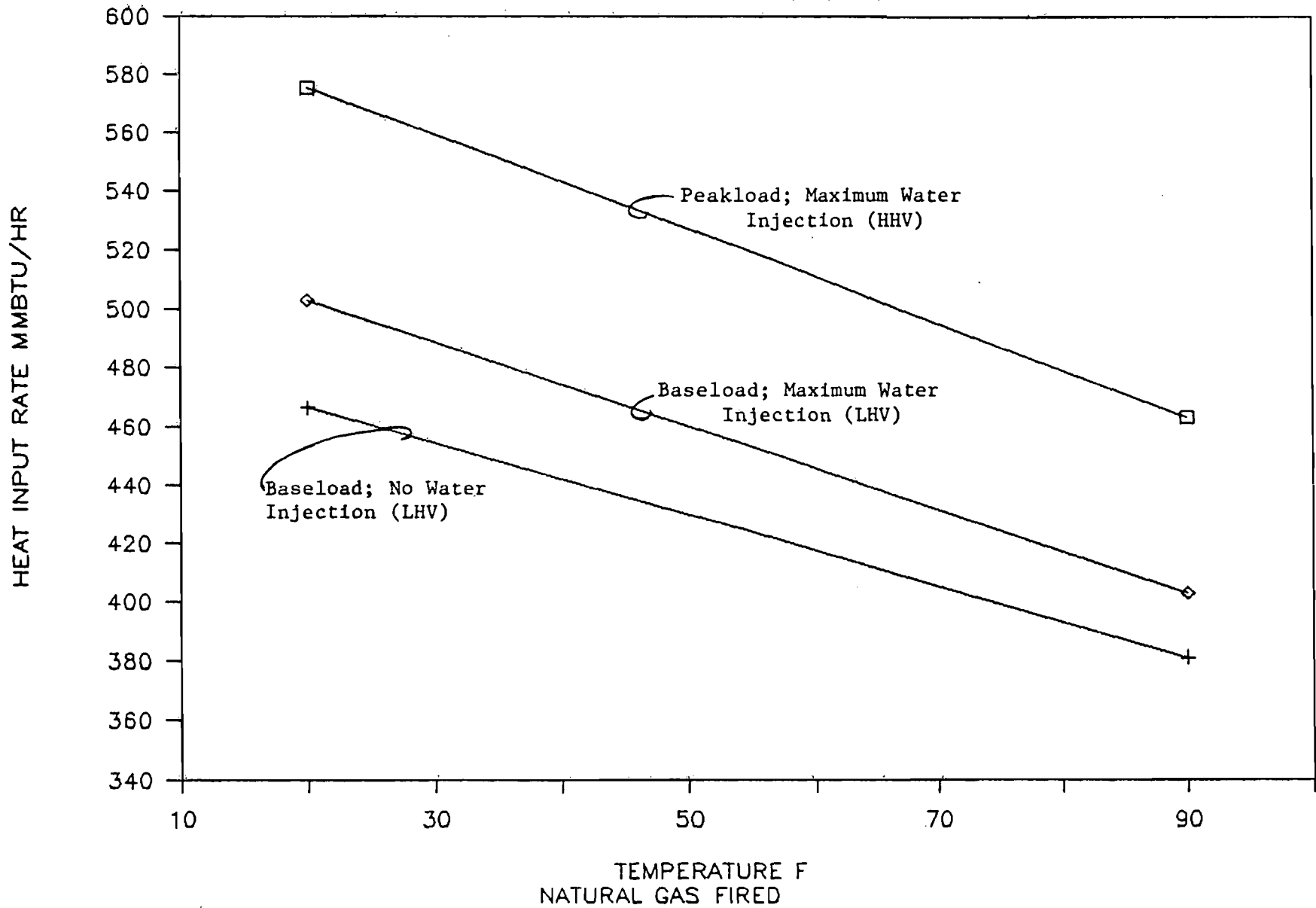
# OUC IRP COMBUSTION TURBINES

## HEAT INPUT VS TEMPERATURE



# OUC IRP COMBUSTION TURBINES

## HEAT INPUT VS TEMPERATURE



GENERAL  ELECTRIC

TURBINE TECHNOLOGY DEPARTMENT • TURBINE BUSINESS OPERATIONS  
GENERAL ELECTRIC COMPANY • ONE RIVER ROAD • SCHENECTADY, NEW YORK 12345 • (518) 385-4523

February 4, 1988

Black & Veatch Engineers - Architects  
1500 Meadow Lake Parkway  
Kansas City, Missouri 64114

Attention: Mr. D. D. Schultz

Subject: Orlando Utilities Commission  
Indian River CT Project  
Combustion Turbine Project  
B&V File 14137.62.1001.02

Message No: GES/OUC/TJS/L-004

Dear Mr. Schultz

Attached you will find performance data for 20°F, 30°F, and 90°F (60% RH) recalculated at 24 feet elevation. This data replaces the data provided at the January 27 & 28 Coordination Meeting.

I have also included data for 90°F, 90% RH, and 24 feet per your request of February 4, 1988.

Please call me if you need additional information.

Regards,



T. J. Schoenholz

cc: D. D. Schultz, B&V  
K. P. Ksionek, OUC  
T. D. Slepow, OUC  
W. G. Gibbons, GE  
B. W. Goche, GE

Attach.

TJS:jfc

3850w

ORLANDO UTILITIES COMM  
 \*\*\*\*\*

ESTIMATED PERFORMANCE - PG6541(B)  
 -----

		BASE	PEAK	BASE	PEAK
FUEL TYPE		NAT GAS	NAT GAS	DIST	DIST
FUEL LHV	- Btu/lb	21515	21515	18550	18550
COMPRESSOR INLET TEMP.	- Deg F.	90	90	90	90
OUTPUT	- kW	35460.	38730.	34420.	37620.
HEAT RATE (LHV)	- Btu/kWh	11500.	11420.	11590.	11490.
HEAT CONS. (LHV) X10-6	- Btu/h	407.8	442.3	398.9	432.3
EXHAUST FLOW X10-3	- lb/h	1035.0	1038.0	1036.0	1039.0
EXHAUST TEMP	- Deg F.	1018.	1060.	1019.	1062.
EXHAUST HEAT X10-6	- Btu/h	255.6	275.0	253.0	272.0
WATER FLOW	- lb/h	14980.	17780.	12670.	14980.
NOX	- ppmvd @ 15% O2	42.	42.	65.	65.
NOX AS NO2	- lb/h	69.	75.	109.	119.

SITE CONDITIONS  
 \*\*\*\*\*

ELEVATION	- ft.	24
INLET LOSS	- in. Water	4
EXHAUST LOSS	- in. Water	2.5
RELATIVE HUMIDITY	- %	60
APPLICATION	-	AIR COOLED GENERATOR

\* AS REPORTED USING GE MEASUREMENT TECHNIQUES

90F 60%RH AT 24FT PERFORMANCE.

TBO-  
 P.GARRISON 2/4/88

ORLANDO UTILITIES COMM

\*\*\*\*\*

ESTIMATED PERFORMANCE - PG6541(B)

		BASE	PEAK	BASE	PEAK
FUEL TYPE		NAT GAS	NAT GAS	DIST	DIST
FUEL LHV	- Btu/lb	21515	21515	18550	18550
COMPRESSOR INLET TEMP.	- Deg F.	90	90	90	90
OUTPUT	- kW	35110.	38330.	34110.	37270.
HEAT RATE (LHV)	- Btu/kWh	11490.	11400.	11590.	11480.
HEAT CONS. (LHV) X10-6	- Btu/h	403.4	437.0	395.3	427.9
EXHAUST FLOW X10-3	- lb/h	1027.0	1030.0	1028.0	1031.0
EXHAUST TEMP	- Deg F.	1020.	1082.	1021.	1084.
EXHAUST HEAT X10-6	- Btu/h	255.6	274.4	253.1	271.7
WATER FLOW	- lb/h	12130.	14690.	10220.	12310.
NOX	- ppmvd @ 15% O2	42.	42.	65.	65.
NOX AS NO2	- lb/h	68.	74.	109.	118.

SITE CONDITIONS

\*\*\*\*\*

ELEVATION	- ft.	24
INLET LOSS	- in. Water	4
EXHAUST LOSS	- in. Water	2.5
RELATIVE HUMIDITY	- %	90
APPLICATION	-	AIR COOLED GENERATOR

\* AS REPORTED USING GE MEASUREMENT TECHNIQUES

90F 90%RH AT 24FT PERFORMANCE

TBO-  
P.GARRISON 2/4/88



ORLANDO UTILITIES COMM  
 \*\*\*\*\*

ESTIMATED PERFORMANCE - PG6541(B)  
 -----

		BASE	PEAK	BASE	PEAK
		NAT GAS	NAT GAS	DIST	DIST
FUEL TYPE					
FUEL LHV	- Btu/lb	21515	21515	18550	18550
COMPRESSOR INLET TEMP.	- Deg F.	30	30	30	30
OUTPUT	- kW	44630.	46140.	43550.	47030.
HEAT RATE (LHV)	- Btu/kWh	10990.	10990.	11070.	11060.
HEAT CONS. (LHV)	X10-6 - Btu/h	490.5	529.1	482.1	520.2
EXHAUST FLOW	X10-3 - lb/h	1200.0	1205.0	1202.0	1206.0
EXHAUST TEMP	- Deg F.	979.	1040.	980.	1042.
EXHAUST HEAT	X10-6 - Btu/h	298.3	319.9	295.5	317.3
WATER FLOW	- lb/h	21380.	25130.	19760.	22900.
NOX	- ppmvd @ 15% O2	42.	42.	65.	65.
NOX AS NO2	- lb/h	83.	90.	132.	143.

SITE CONDITIONS  
 \*\*\*\*\*

ELEVATION	- ft.	24
INLET LOSS	- in. Water	4
EXHAUST LOSS	- in. Water	2.5
RELATIVE HUMIDITY	- %	90
APPLICATION	-	AIR COOLED GENERATOR

\* AS REPORTED USING GE MEASUREMENT TECHNIQUES  
 30F AT 24FT PERFORMANCE.

TBO-  
 P. GARRISON 2/4/88

ORLANDO UTILITIES COMM  
 \*\*\*\*\*

ESTIMATED PERFORMANCE - PG6541(B)  
 -----

		BASE	PEAK	BASE	PEAK
		NAT GAS	NAT GAS	DIST	DIST
FUEL TYPE					
FUEL LHV	- Btu/lb	21515	21515	18550	18550
COMPRESSOR INLET TEMP.	- Deg F.	20	20	20	20
OUTPUT	- kW	46050.	49610.	44980.	48510.
HEAT RATE (LHV)	- Btu/kWh	10930.	10940.	11010.	11010.
HEAT CONS. (LHV)	X10-6 - Btu/h	503.3	542.7	495.2	534.1
EXHAUST FLOW	X10-3 - lb/h	1227.0	1232.0	1229.0	1233.0
EXHAUST TEMP	- Deg F.	973.	1034.	974.	1035.
EXHAUST HEAT	X10-6 - Btu/h	305.4	327.6	302.6	324.9
WATER FLOW	- lb/h	21960.	25780.	20560.	23800.
NOX	- ppmvd @ 15% O2	42.	42.	65.	65.
NOX AS NO2	- lb/h	85.	92.	136.	147.

SITE CONDITIONS

\*\*\*\*\*

ELEVATION	- ft.	24
INLET LOSS	- in. Water	4
EXHAUST LOSS	- in. Water	2.5
RELATIVE HUMIDITY	- %	90
APPLICATION	-	AIR COOLED GENERATOR

\* AS REPORTED USING GE MEASUREMENT TECHNIQUES

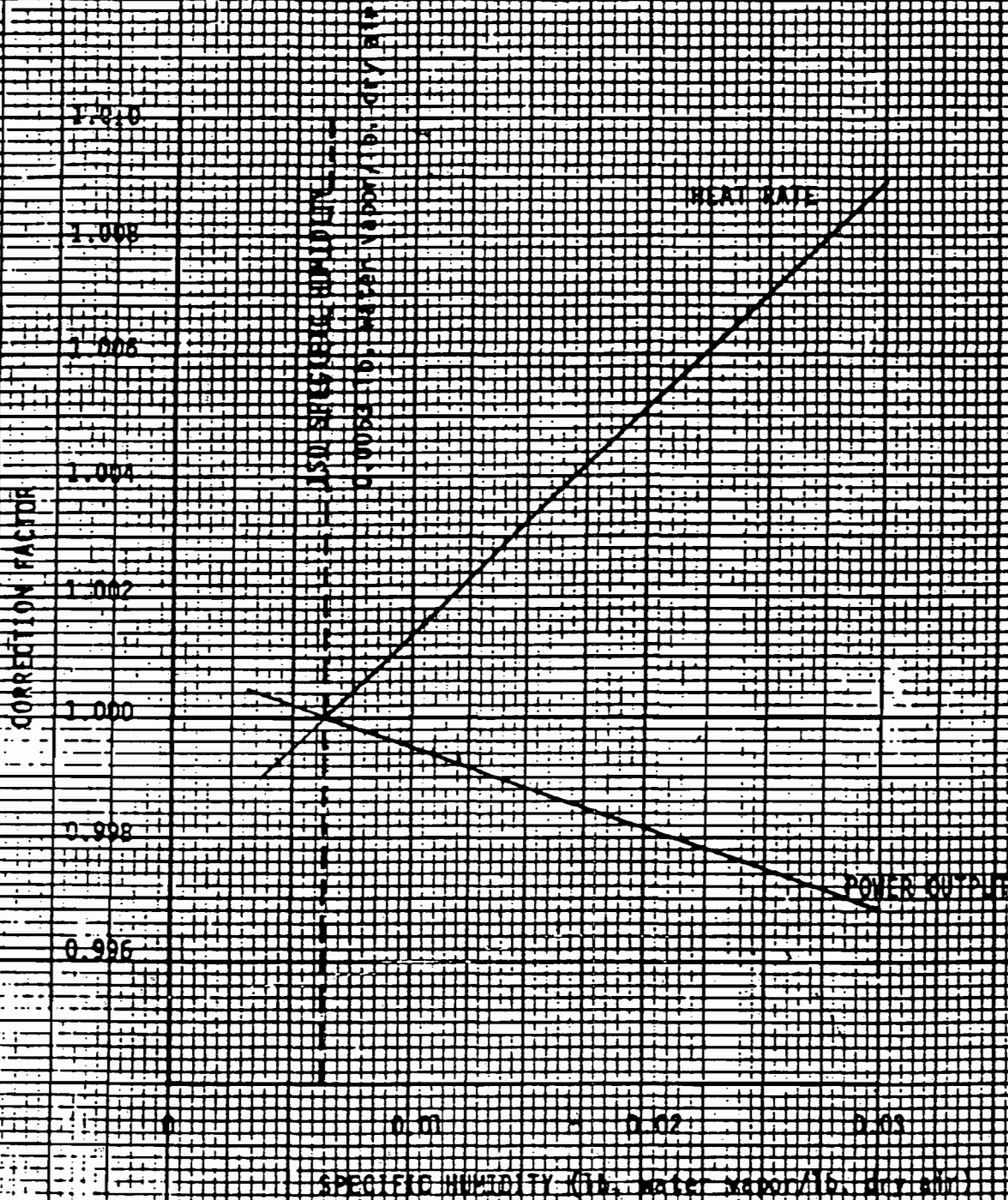
20F AT 24 FT PERFORMANCE.

TBO-  
 P.GARRISON 2/4/88

# GENERAL ELECTRIC MS6001, MS7001 AND MS9001 GAS TURBINES

## CORRECTIONS TO OUTPUT AND HEAT RATE FOR NON-ISO SPECIFIC HUMIDITY CONDITIONS

For operation at base load on exhaust  
temperature control curve



**GENERAL ELECTRIC MODEL PG6541(B) GAS TURBINE**  
**ESTIMATED PERFORMANCE - CONFIGURATION: NAT. GAS & DIST.**  
 Compressor Inlet Conditions 59 F (15.0 C), 60% Rel. Humidity  
 Atmospheric Pressure 14.7 psia (1.013 bar)

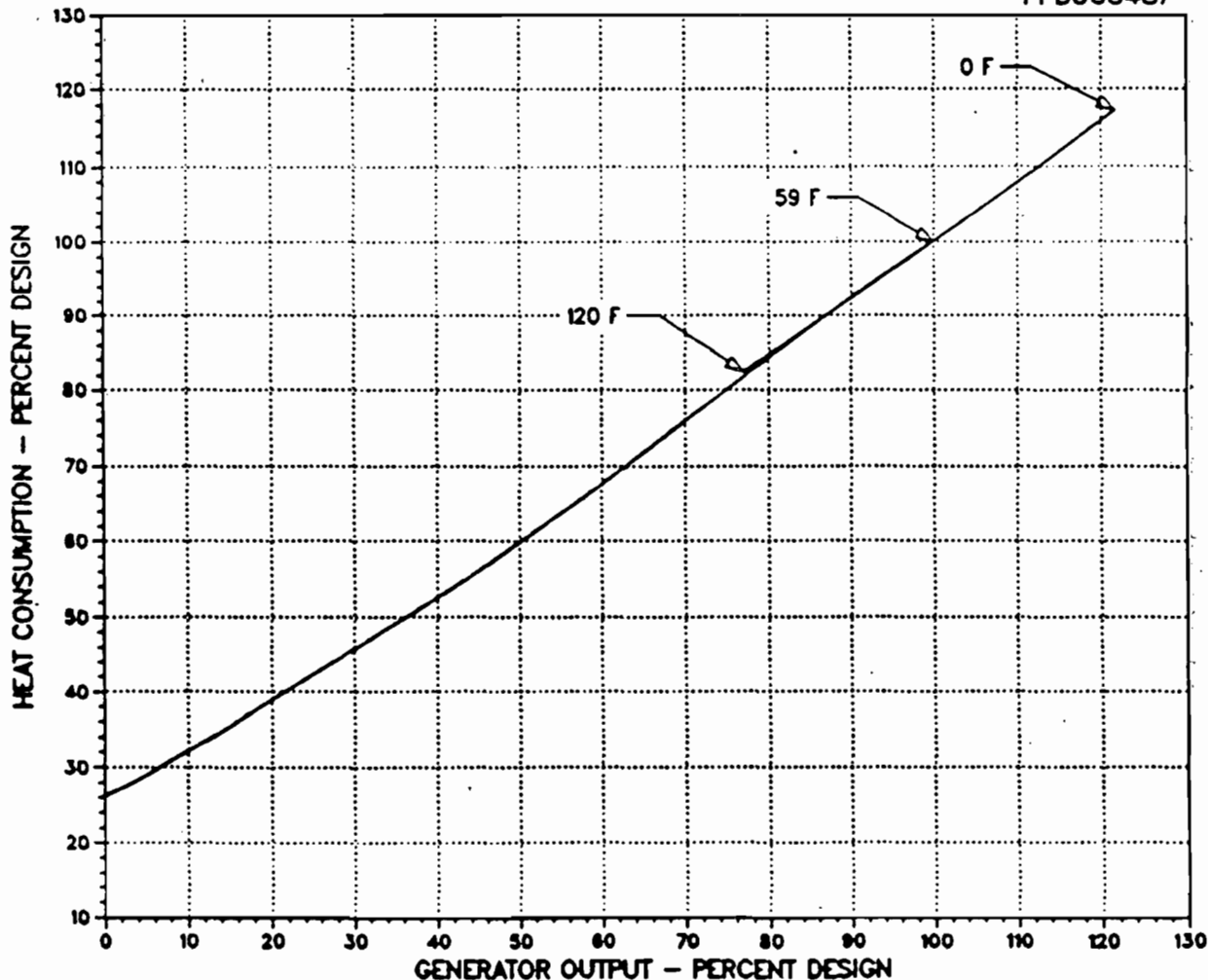
FUEL		NATURAL GAS	DISTILLATE
DESIGN OUTPUT	kW	38340	37520
DESIGN HEAT RATE (LHV)	Btu (kJ)/kWh	10860 (11460)	10970 (11570)
DESIGN HEAT CONS (LHV) X10-6	Btu (kJ)/h	416.4 (439.4)	411.6 (434.1)
DESIGN EXHAUST FLOW X10-3	lb (kg)/h	1103. (500.5)	1106. (501.4)
MODE: BASE LOAD			

**NOTES:**

- Altitude correction on curve 416HA662
- Ambient temperature correction on curve 499HA543
- Effects of modulated inlet guide vanes on curve 499HA555
- Steam injection effects on curve 499HA531 & 499HA532
- Humidity correction on curve 498HA697 - all performance calculated with specific humidity of .0064 or less so as not to exceed 100% relative humidity.
- Plant performance is measured at the generator terminals and includes allowances for excitation power, shaft driven auxiliaries, and 4.0 in. H<sub>2</sub>O (10.0 mbar) inlet and 2.5 in. H<sub>2</sub>O (6.2 mbar) exhaust pressure drops.
- Additional pressure drop effects:

	%Effect on Output	Effect on Heat Rate	Effect on Exhaust Temp.
4 in. H <sub>2</sub> O (10.0 mbar) inlet	-1.40	0.40	2.2 F (1.2 C)
4 in. H <sub>2</sub> O (10.0 mbar) exhaust	-0.40	0.40	2.2 F (1.2 C)

PPB060487



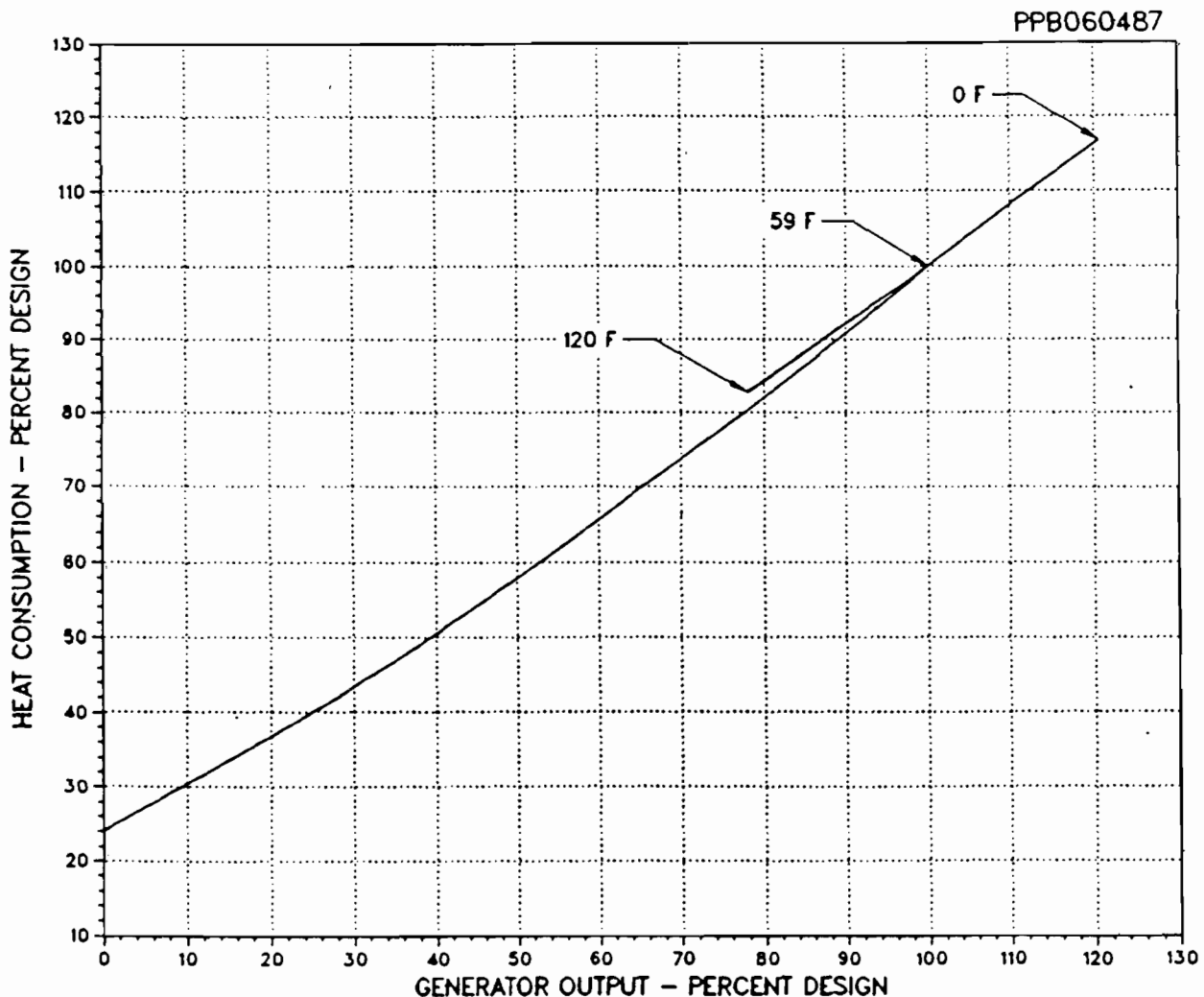
GENERAL ELECTRIC MODEL PG6541(B) GAS TURBINE  
 ESTIMATED PERFORMANCE - CONFIGURATION: NAT. GAS & DIST.  
 Compressor Inlet Conditions 59 F (15.0 C), 60% Rel. Humidity  
 Atmospheric Pressure 14.7 psia (1.013 bar)

FUEL		NATURAL GAS	DISTILLATE
DESIGN OUTPUT	kW	41400	40600
DESIGN HEAT RATE (LHV)	Btu (kJ)/kWh	10780 (11370)	10880 (11480)
DESIGN HEAT CONS (LHV) X10-6	Btu (kJ)/h	446.3 (470.7)	441.7 (466.1)
DESIGN EXHAUST FLOW X10-3	lb (kg)/h	1104 (500.8)	1107 (502.2)
MODE: PEAK LOAD			

NOTES:

1. Altitude correction on curve 416HA662
2. Ambient temperature correction on curve 499HA559
3. Humidity correction on curve 498HA697 - all performance calculated with specific humidity of .0064 or less so as not to exceed 100% relative humidity.
4. Plant performance is measured at the generator terminals and includes allowances for excitation power, shaft driven auxiliaries, and 4.0 in. H<sub>2</sub>O (10.0 mbar) inlet and 2.5 in. H<sub>2</sub>O (6.2 mbar) exhaust pressure drops.
5. Additional pressure drop effects:

	%Effect on Output	%Effect on Heat Rate	Effect on Exhaust Temp.
4 in. H <sub>2</sub> O (10.0 mbar) inlet	-1.45	0.45	2.2 F (1.2 C)
4 in. H <sub>2</sub> O (10.0 mbar) exhaust	-0.45	0.45	2.2 F (1.2 C)

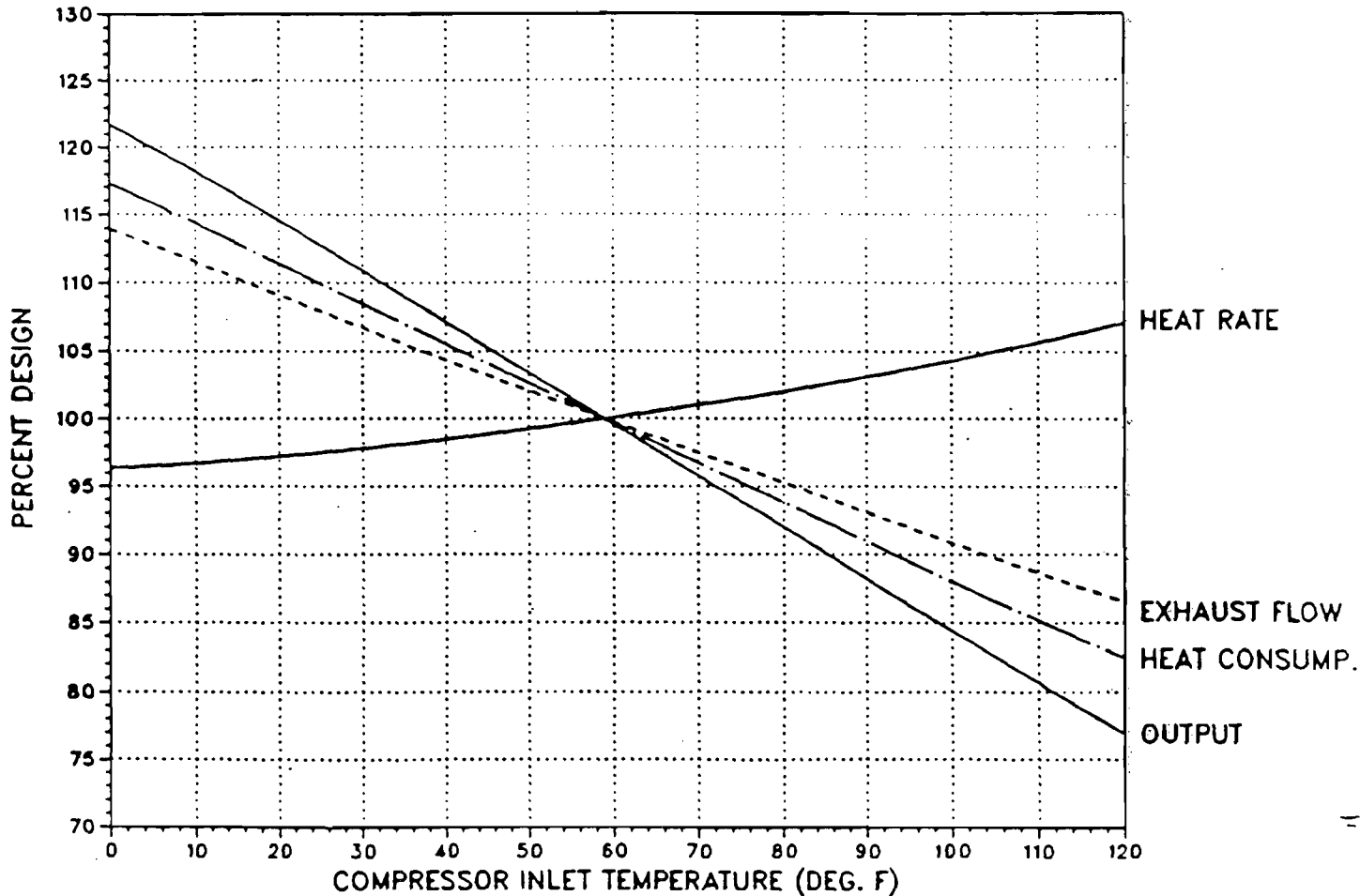
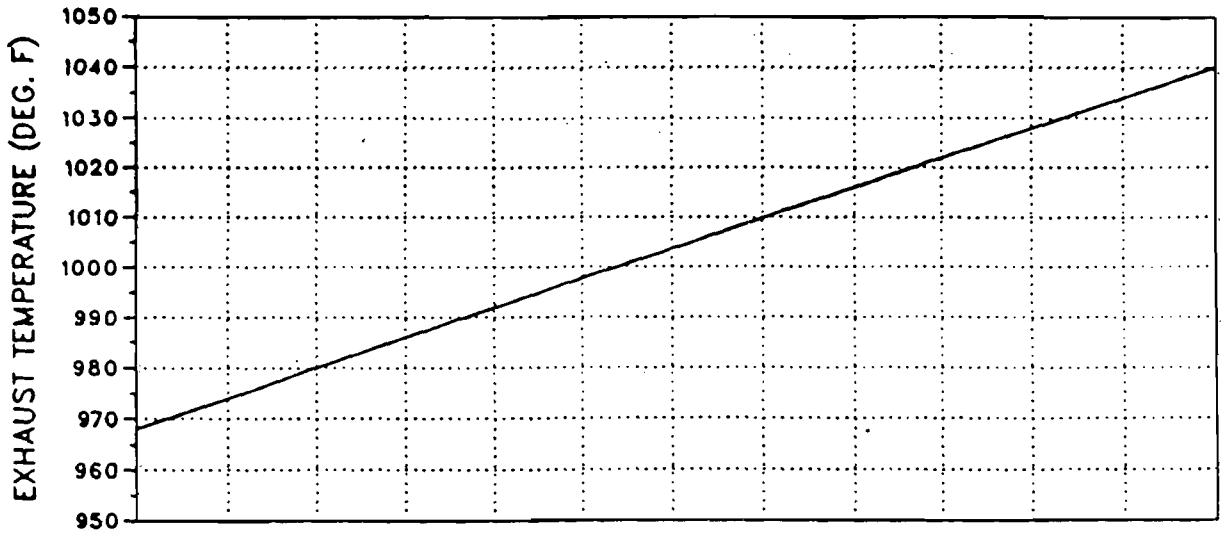


# GENERAL ELECTRIC MODEL PG6541(B) GAS TURBINE ESTIMATED PERFORMANCE

OUTPUT, HEAT RATE, HEAT CONSUMPTION

EXHAUST FLOW AND EXHAUST TEMPERATURE AT 100% SPEED

FUELS: NATURAL GAS AND DISTILLATE  
MODE: BASE LOAD



DATE 9/11/87

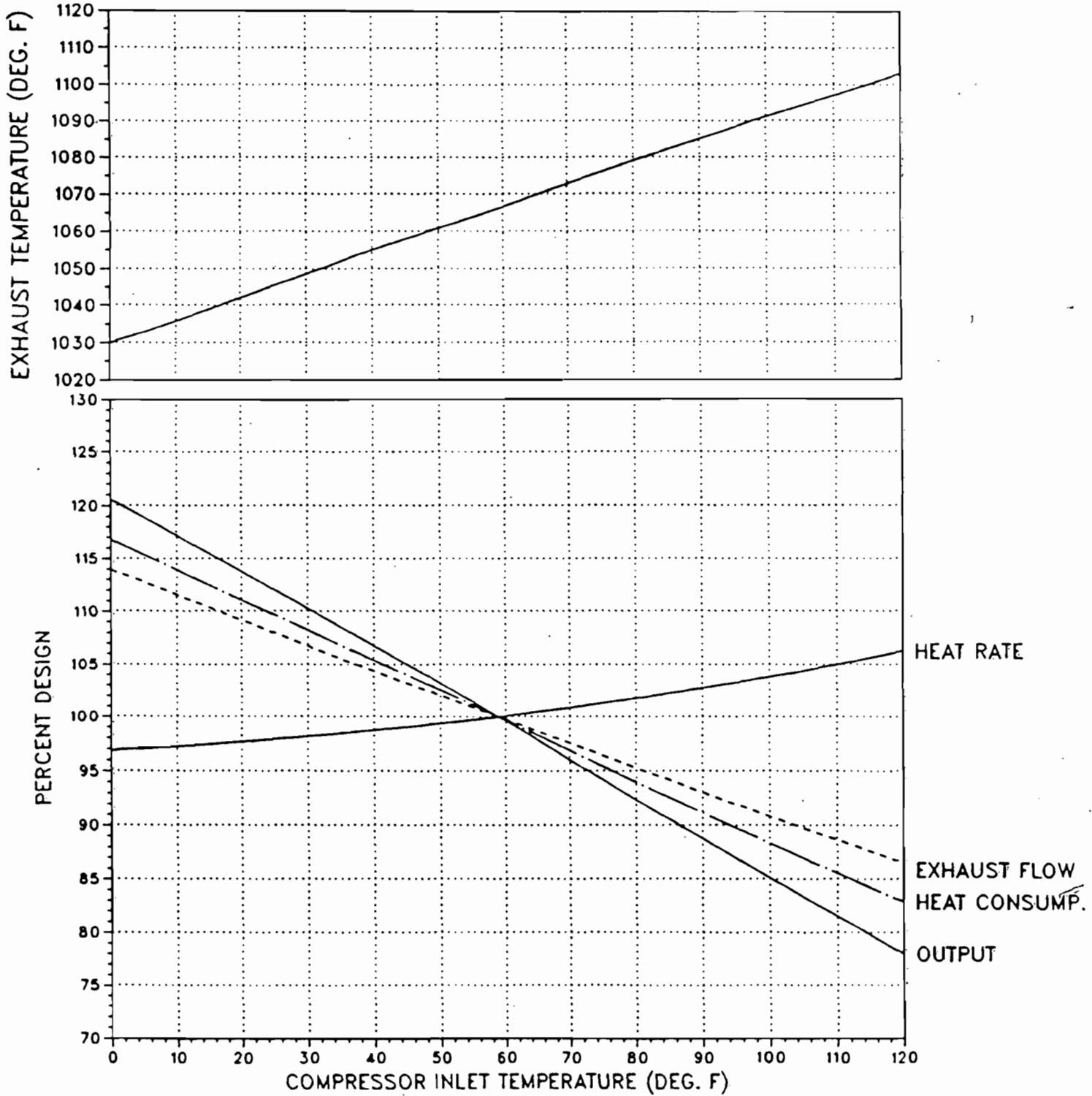
*JHB*  
F.J. BROOKS

499HA543

# GENERAL ELECTRIC MODEL PG6541(B) GAS TURBINE ESTIMATED PERFORMANCE

EFFECT OF COMPRESSOR INLET TEMPERATURE ON  
OUTPUT, HEAT RATE, HEAT CONSUMPTION  
EXHAUST FLOW AND EXHAUST TEMPERATURE AT 100% SPEED

FUEL: NATURAL GAS AND DISTILLATE  
MODE: PEAK LOAD



DATE 11/30/87  
KH Conway

499HA559



PM  
8-8-88  
Atlanta, GA

*file copy*

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET  
ATLANTA, GEORGIA 30365

4APT-APB

RECEIVED

AUG 8 1988

AUG 10 1988

C. H. Fancy, P.E., Deputy Chief  
Bureau of Air Quality Management  
Florida Department of Environmental Regulation  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

DER-BAQM

Re: Orlando Utilities Commission (PSD-FL-130)

Dear Mr. Fancy:

This is to acknowledge our receipt of your July 18, 1988, preliminary determination and draft permit for Orlando Utilities to construct a four unit combustion turbine project at the Indian River Plant. We have reviewed and concurred with your determination. This permit will not be reviewed under the Region IV Overview of State Programs policy.

Please submit copies of the final determination and permit when they are issued. If you have any additional information or comments, please contact me or Gary Ng of my staff at (404) 347-2864.

Sincerely yours,

*Bruce P. Miller*

Bruce P. Miller, Chief  
Air Programs Branch  
Air, Pesticides, and Toxics  
Management Division

*Copied: Pradeep Raval  
Barry Andrews  
Max Finn  
Chuck Collins, CF Dist.  
CHF/BT*



Fed. Ex.  
7-27-88, Orlando FL  
Airbill # 431870972

*file copy*



**ORLANDO UTILITIES COMMISSION**

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 305/423-9100

July 27, 1988

**RECEIVED**

C.H. Fancy, Deputy Chief  
Bureau of Air Quality Management  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

JUL 28 1988

DER-BAQM

RE: Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Dear Mr. Fancy:

Enclosed please find the proof of publication for OUC's Combustion Turbine Project at the Indian River Plant.

Please feel free to call me at (407)423-9141 if you have questions or comments regarding this permit.

Sincerely,

*J.S. Crall*  
J.S. Crall  
Director  
Environmental Division

JSC:sp

Enclosures

xc: W.H. Herrington  
T.L. Smith  
S.M. Day, B&V

*Copied: Pradeep Rawal  
Mack Linn  
Barry Andrews  
Gene Saccchi, CF D&L  
Wayne Bronson, EPA  
Miguel Flores, NPS*

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51788

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**1** From (Your Name) **J.S. Crall** Your Phone Number (Very Important) **(407) 423-9141**

Company **ORLANDO UTILITIES COMMISSION** Department/Floor No.

Street Address **500 S ORANGE AVE ROOM 408**

City **ORLANDO** State **FL**

**2** To (Recipient's Name) **C.H. Fancy** Recipient's Phone Number (Very Important) **(904) 488-1344**

Company **Bureau of Air Quality Management** Department/Floor No.

Exact Street Address (Use of P.O. Boxes or P.O. Zip Codes Will Delay Delivery And Result In Extra Charge.) **2600 Blair Stone Road**

City **Tallahassee** State **FL**

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City State

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**PRIORITY 1** - Delivery is scheduled early next business morning in most locations. It may take two or more business days if the destination is outside our primary service areas.

**STANDARD AIR** - Delivery is generally next business day or not later than second business day. It may take three or more business days if the destination is outside our primary service areas.

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**DELIVER SATURDAY** (Extra charge applies)

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**DRY ICE** Lbs.

**OTHER SPECIAL SERVICE**

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Third Party

Street Address

City State Zip

Received By

Date/Time Received

FedEx Employee Number

Received At Shipper's Door

Regular Stop

On-Call Stop

FedEx Loc.

Federal Express Corp. Employee No. **2033**

Date/Time For Federal Express Use **7/27 11:2**

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 FEC-S-751-1000  
 REVISION DATE 2/85  
 PRINTED U.S.A. GBF

RECIPIENT'S COPY

# CAPE PUBLICATIONS, INC.

**The Times**

Published Weekly on Wednesday

**THE TRIBUNE**

Published Weekly on Wednesday

**STAR-ADVOCATE**

Published Weekly on Wednesday



**Published Daily**

State of Florida  
 Department of  
 Environmental Regulation  
 Notice of Intent  
 The Department of Environmental Regulation hereby gives notice of its intent to issue permits to Orlando Utilities Commission to construct four new simple cycle combustion turbines, each with an electrical generation capacity of about 35 MW, at the existing Indian River Plant, Brevard County, Florida. The Department is issuing this intent to issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative determination (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Failure to file a petition within this time period constitutes a waiver of any right such person has to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the proposed agency action. Therefore, persons who may not wish to file a petition may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Rule 28-5.207, Florida Administrative Code, at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009 Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

The applications are 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 Regulation  
 Bureau of Air Quality Management  
 2600 Blair Stone Road  
 Tallahassee, Florida 32399-2400

Dept. of Environmental Regulation  
 Central Florida District  
 3319 Maguire Blvd., Suite 232  
 Orlando, Florida 32803-3767

Any person may send written comments on the proposed action to Mr. Bill Thomas at the department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the department's final determination.

TC9430-1T-7/21/1988  
 Thursday

STATE OF FLORIDA  
COUNTY OF BREVARD

Before the undersigned authority personally appeared Linda L. Spicer who on oath says that he/she is Legal Advertising Clerk

of the FLORIDA TODAY, a newspaper published in Brevard County,

Florida; that the attached copy of advertising being a Legal Notice of Intent

\_\_\_\_\_ in the matter of \_\_\_\_\_

State of Florida Dept. of Environmental Regulation

\_\_\_\_\_ in the \_\_\_\_\_ Court

was published in the FLORIDA TODAY NEWSPAPER

in the issues of July 21, 1988

Affiant further says that the said FLORIDA TODAY NEWSPAPER

is a newspaper published in said Brevard County, Florida and that the said newspaper has heretofore been continuously published in said Brevard County, Florida regularly as stated above, and has been entered as second class mail matter at the post office in COCOA,

said Brevard County, Florida for a period of one year next preceeding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in said newspaper.

Linda L. Spicer  
Sworn and subscribed to before me this

21st day of July A.D., 1988

Cathy L. Smith  
Notary Public  
State of Florida at Large  
My Commission Expires March 29, 1992



# Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

July 18, 1988

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. William Herrington  
Orlando Utilities Commission  
500 South Orange Avenue  
Orlando, Florida 32802

Dear Mr. Herrington:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit for Orlando Utilities Commission to construct a four unit combustion turbine project at the Indian River Plant, Brevard County, Florida.

Please submit, in writing, any comments which you wish to have considered concerning the Department's proposed action to Mr. Bill Thomas of the Bureau of Air Quality Management.

Sincerely,

C. H. Fancy, P.E.  
Deputy Chief  
Bureau of Air Quality  
Management

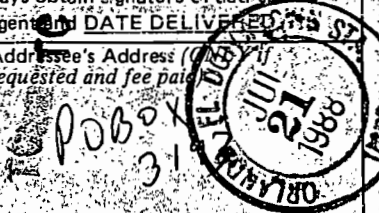
CHF/pr

Attachments

cc: T. Sawicki, Central Florida District  
W. Aronson, EPA  
M. Flores, NPS  
J. Crall, OUC  
S. Day, Black & Veatch.

**SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4. Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1.  Show to whom delivered, date, and addressee's address. **2.**  Restricted Delivery **1** (Extra charge) **1** (Extra charge)

<b>3. Article Addressed to:</b> Mr. William Herrington Oalando Utilities Commission 500 South Orange Avenue Orlando, Florida 32802	<b>4. Article Number</b> P 702 175 481
<b>5. Signature - Addressee</b> X <i>Mr. W. H.</i>	<b>Type of Service:</b> <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail
<b>6. Signature - Agent</b> X	Always obtain signature of addressee or agent and <b>DATE DELIVERED</b>
<b>7. Date of Delivery</b>	<b>8. Addressee's Address (if requested and fee paid)</b> PO BOX 31 

PS Form 3811, Mar. 1987 \* U.S.G.P.O. 1987-178-268 DOMESTIC RETURN RECEIPT

P 702 175 481  
**RECEIPT FOR CERTIFIED MAIL**  
 NO INSURANCE COVERAGE PROVIDED  
 NOT FOR INTERNATIONAL MAIL  
 (See Reverse)

PS Form 3800, June 1985

Sent to Mr. William Herrington, OUC	
Street and No. 500 South Orange A.e.	
P.O., State and ZIP Code Orlando, FL 32802	
Postage	\$
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Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date Mailed: 7-18-88 Permit: AC 05-144482 AC 05-146749, AC 05-146750 AC 05-146751	

BEFORE THE STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of  
Applications for Permits by:

Orlando Utilities Commission  
500 South Orange Avenue  
Orlando, Florida 32802

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DER File No. AC 05-144482  
05-146749  
05-146750  
05-146751

INTENT TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue permits (copy attached) for the proposed project as detailed in the applications specified above. The Department is issuing this Intent to Issue for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, Orlando Utilities Commission, applied on January 20, 1988 to the Department of Environmental Regulation for permits to construct four new simple cycle combustion turbines, each with an electrical generation capacity of about 35 MW, at the existing Indian River Plant, Brevard County, Florida.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that an air construction permits were needed for the proposed work.

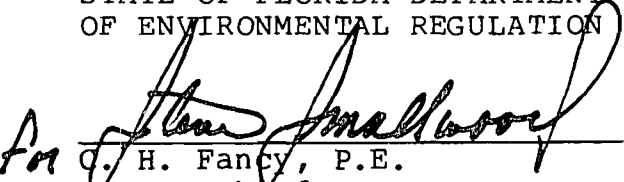
Pursuant to Section 403.815, F.S. and DER Rule 17-103.150, FAC, you (the applicant) are required to publish at your own expense the enclosed Notice of Proposed Agency Action on permit applications. The notice must be published one time only in a section of a major local newspaper of general circulation in the county in which the project is located and within thirty (30) days from receipt of this intent. Proof of publication must be provided to the Department within seven days of publication of the notice. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permits.

The Department will issue the permits with the attached conditions unless petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S. A person whose substantial interests are affected by the

Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. Petitions must comply with the requirement of Florida Administrative Code Rules 17-103.155 and 28-5.201 (copy enclosed) and be filed with (received by) the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant must be filed within fourteen (14) days of receipt of this intent. Petitions filed by other persons must be filed within fourteen (14) days of publication of the public notice or within fourteen (14) days of receipt of this intent, whichever first occurs. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes, concerning the subject permit application. Petitions which are not filed in accordance with the above provisions will be dismissed.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL REGULATION

*For*   
C. H. Fancy, P.E.  
Deputy Chief  
Bureau of Air Quality  
Management

Copies furnished to:

T. Sawicki, Central Florida District  
W. Aronson, EPA  
M. Flores, NPS  
J. Crall, OUC  
S. Day, Black & Veatch.

RULES OF THE ADMINISTRATIVE COMMISSION  
MODEL RULES OF PROCEDURE  
CHAPTER 28-5  
DECISIONS DETERMINING SUBSTANTIAL INTERESTS

28-5.15 Requests for Formal and Informal Proceedings

- (1) Requests for proceedings shall be made by petition to the agency involved. Each petition shall be printed, typewritten or otherwise duplicated in legible form on white paper of standard legal size. Unless printed, the impression shall be on one side of the paper only and lines shall be double spaced and indented.
- (2) All petitions filed under these rules should contain:
  - (a) The name and address of each agency affected and each agency's file or identification number, if known;
  - (b) The name and address of the petitioner or petitioners;
  - (c) All disputed issues of material fact. If there are none, the petition must so indicate;
  - (d) A concise statement of the ultimate facts alleged, and the rules, regulations and constitutional provisions which entitle the petitioner to relief;
  - (e) A statement summarizing any informal action taken to resolve the issues, and the results of that action;
  - (f) A demand for the relief to which the petitioner deems himself entitled; and
  - (g) Such other information which the petitioner contends is material.



CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on 7-18-88.

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

Martha Jane Wise 7-18-88  
Clerk Date

State of Florida  
Department of Environmental Regulation  
Notice of Intent

The Department of Environmental Regulation hereby gives notice of its intent to issue permits to Orlando Utilities Commission to construct four new simple cycle combustion turbines, each with an electrical generation capacity of about 35 MW, at the existing Indian River Plant, Brevard County, Florida. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative determination (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Failure to file a petition within this time period constitutes a waiver of any right such person has to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the proposed agency action. Therefore, persons who may not wish to file a petition may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Rule 28-5.207, Florida Administrative Code, at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009 Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

The application 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 Regulation  
Bureau of Air Quality Management  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Dept. of Environmental Regulation  
Central Florida District  
3319 Maguire Blvd., Suite 232  
Orlando, Florida 32803-3767

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination.

Technical Evaluation  
and  
Preliminary Determination

Orlando Utilities Commission  
Indian River Plant  
Titusville, Brevard County, Florida

Combustion Turbine Facility  
Permit Numbers:

Unit 1, AC 05-144482  
Unit 2, AC 05-146749  
Unit 3, AC 05-146750  
Unit 4, AC 05-146751

PSD-FL-130

Florida Department of Environmental Regulation  
Bureau of Air Quality Management  
Central Air Permitting

July 15, 1988

## I. Application

### A. Applicant

Orlando Utilities Commission (OUC)  
500 South Orange Avenue  
Orlando, Florida 32802

### B. Project and Location

The applicant proposes to install four new simple cycle combustion turbines, each with an electrical generation capacity of about 35 MW, at the existing Indian River Plant.

The UTM coordinates of this facility are Zone 17, 521.5 km East and 3151.6 km North.

OUC applied on January 20, 1988, and the application was deemed complete on June 21, 1988.

### C. Facility Category

Orlando Utilities Indian River Plant is classified in the Standard Industrial Classification (SIC) Code as Group No. 49, Electric, Gas and Sanitary Services; Group No. 493, Electric, Gas and Sanitary Services; Industry No. 4931, Electric Services. In accordance with the NEDS Source Classification Code (SCC) the source is classified as 2-01-001-01, Distillate Oil Fired Turbine; and 201-002-01, Natural Gas Fired Turbine.

## II. Project Description

### A. Project

Four identical GE Frame 6 combustion turbines are being proposed for the project. Two will be installed in the near future while two more will be installed later. Natural gas will be the main fuel, but the turbines will be capable of burning distillate oil. The units are being proposed to help meet peak demands readily. The project at present does not include provisions for heat recovery from turbine exhausts.

The applicant proposes to control emissions by firing low sulfur content fuels to reduce sulfur dioxide (SO<sub>2</sub>) emissions and sulfuric acid mist, the use of water injection to reduce nitrogen oxides (NO<sub>x</sub>) emissions, and good combustion practices for controlling emissions of carbon monoxide (CO), particulate matter (PM), volatile organic compounds (VOCs), and beryllium.

## B. Operating Rates

The facility will be permitted based on continuous operation at full load. The projected emissions are listed in Table 1, (attached) based on emission estimates submitted by the applicant and confirmed by a Best Available Control Technology (BACT) determination (attached).

## III. Rule Applicability

The proposed project will emit the pollutants NO<sub>x</sub>, SO<sub>2</sub>, sulfuric acid mist, beryllium, PM, CO and VOCs and is subject to a preconstruction review in accordance with Chapters 17-2 and 17-4 of the Florida Administrative Code (FAC) and Chapter 403 of the Florida Statutes.

The proposed project will be located in Brevard County, an area designated as attainment for all criteria pollutants, in accordance with FAC Rule 17-2.420.

The proposed project will be subject to Prevention of Significant Deterioration (PSD) Review Requirements since there will be a net significant emissions increase (see Table in FAC 17-2.500-2), in accordance with FAC Rule 17-2.500.

The proposed project will also be subject to New Source Performance Standards (NSPS) for Gas Turbines in accordance with 40 CFR 60 Subpart GG.

The emission limitations will be determined by a BACT review, in accordance with FAC Rule 17-2.630.

Compliance testing and reporting will be conducted in accordance with 40 CFR 60 and FAC Rule 17-2.700. EPA methods to be used for compliance testing will be as follows:

- a) EPA Method 5/17 for PM
- b) EPA Method 20 for NO<sub>x</sub> and SO<sub>2</sub>
- c) EPA Method 9 for visible emissions (VE)
- d) EPA Method 10 for CO
- e) EPA Method 104 for Beryllium

## IV. Source Impact Analysis

### A. Emission Limitations

As determined by the attached BACT, the emission limits for the proposed project will be as listed in Table 1.

## B. Air Quality Impact Analysis

### 1. Introduction

The Orlando Utilities Commission proposed addition of four new simple cycle combustion turbines, each with an electrical generation capacity of about 35 megawatts, at the Indian River Plant, will emit in PSD-significant amounts five pollutants. These are the criteria pollutants particulate matter (PM) (including PM-10), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), and volatile organic compounds (VOC).

The air quality impact analysis required by the PSD regulations for the pollutants PM (PM-10), SO<sub>2</sub>, NO<sub>2</sub>, CO, and VOC includes:

- o An analysis of existing air quality;
- o A PSD increment analysis (for SO<sub>2</sub> and PM only);
- o An Ambient Air Quality Standards (AAQS) analysis;
- o An analysis of impacts on soils, vegetation, and visibility and growth-related air quality impacts; and
- o A "Good Engineering Practice" (GEP) stack height determination.

The analysis of existing air quality generally relies on preconstruction monitoring data collected in accordance with EPA-approved methods. The PSD increment and AAQS analysis depend on air quality dispersion modeling carried out in accordance with EPA guidelines.

Based on these required analyses, the Department has reasonable assurance that the proposed sources at the OUC Indian River facility, as described in this report and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any PSD increment or ambient air quality standard. The discussion of the modeling methodology and required analysis follows.

### 2. Modeling Methodology

The EPA-approved Industrial Source Complex Short-Term (ISCST) dispersion model was used in the air quality impact analysis. This model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. The model incorporates elements for plume rise, transport by the mean wind, Gaussian dispersion, and pollutant removal mechanisms such as deposition and transformation. The ISCST model also allows for the separation of sources, building wake downwash, and various other input and output features. A series of specific model features, recommended by the EPA, are referred to as the regulatory options. These features were used to address the air quality impacts of the proposed combustion turbines.

The modeling used a radial receptor grid with the center of the grid coinciding with the location of the proposed turbines. Radials were spaced at 10-degree increments from 10 to 360 degrees. Receptors were located along each radial at distances of 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.5, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0 and 14.0 kilometers.

The meteorological data used in the ISCST model consisted of five years (1981-1985) of hourly surface data taken at Orlando, Florida. Mixing heights used in the modeling were based on upper air data from Tampa, Florida for the same period.

Emission data (Table 1) are the maximum allowable emissions which are based on the fuel that each source is capable of firing and that produced the higher emission rate. For modeling purposes, the higher emissions from firing distillate oil, as compared to firing natural gas, were used to assess impacts.

### 3. Analysis of Existing Air Quality

Preconstruction ambient air quality monitoring is required for all pollutants subject to PSD review. In general, one year of quality-assured data using an EPA-reference, or the equivalent, monitor must be submitted. Sometimes less than one year of data, but no less than four months, may be accepted when Department approval is given.

An exemption to the monitoring requirement can be obtained if the maximum air quality impact, as determined through air quality modeling, is less than a pollutant-specific "de minimus" concentration. In addition, if current monitoring data already exist and these data are representative of the proposed source area, then at the discretion of the Department, these data may be used.

The predicted maximum air quality impacts for the proposed turbines for those pollutants subject to PSD review are given in Table 2. As shown in the table, the maximum impacts for all such pollutants are below their respective "de minimus" levels. Therefore, preconstruction monitoring is not required for any pollutant.

### 4. PSD Increment and Ambient Air Quality Standards Analysis

If the dispersion modeling demonstrates that a pollutant does not produce a significant impact, further air quality assessment of this pollutant is not required.

Table 2 compares the air quality significant impact levels with the maximum predicted concentrations. The table shows that no pollutant impacts exceed the significant impact criteria. Therefore, no further ambient air quality assessment is required.



As such, the emissions from the proposed turbines are not expected to cause or contribute to a violation of any PSD increment or ambient air quality standard.

## 5. Additional Impacts Analysis

### a. Impacts on Soils and Vegetation

The maximum ground-level concentrations predicted to occur for the criteria pollutants as a result of the proposed project will be below all applicable AAQS including the national secondary standards developed to protect public welfare-related values. As such, these pollutants are not expected to have a harmful impact on soils and vegetation.

### b. Impact on Visibility

An analysis of possible adverse visibility impairment at the nearest PSD Class I area using the EPA's visibility screening methods was performed by the applicant. The nearest PSD Class I area is the Chassahowitzka Wilderness Area along the west coast of Florida, at a distance of approximately 175 kilometers from the proposed combustion turbines. The results of the Level-1 screening showed that it is highly unlikely that such impairment might occur.

### c. Growth-Related Air Quality Impacts

The proposed turbines are not expected to significantly change employment, population, housing or commercial/industrial development in the area to the extent that an air quality impact will result.

### d. GEP Stack Height Determination

Good Engineering Practice (GEP) stack height means the greater of: (1) 65 meters or (2) the maximum nearby building height plus 1.5 times the building height or width, whichever is less. For the proposed project, stack heights of 10.97 meters are proposed. The proposed stack height is well below the GEP limit of 65 meters.

## V. Conclusion

Based on the information submitted by OUC, the Department has reasonable assurance that the installation of the four turbine facility at the Indian River Plant, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of an ambient air quality standard or PSD increment, or any other provisions of Chapter 17-2, FAC.

TABLE 1

SUMMARY OF AIR POLLUTANT EMISSIONS FROM PROPOSED  
COMBUSTION TURBINES

Pollutant	Fuel	Maximum Emissions Per Unit lb/h	Potential Annual Emissions*		PSD Significant Emission Rate t/yr
			1 unit t/yr	4 Units t/yr	
Carbon Monoxide	Gas	10.0	43.8	175	100
	Oil	10.1	44.2	177	100
Nitrogen Oxides (as NO <sub>2</sub> )	Gas	75.1	328.9	1,316	40
	Oil	118.3	518.2	2,073	40
Sulfur Dioxide	Gas	0.34	1.5	6.0	40
	Oil	142.7	625.0	2,500	40
Total Particulates	Gas	2.5	11.0	44	25
	Oil	10.0	43.8	175	25
PM <sub>10</sub>	Gas	2.5	11.0	44	15
	Oil	10.0	43.8	175	15
VOC	Gas	4.0	17.5	70	40
	Oil	4.0	17.5	70	40
Sulfuric Acid Mist	Oil	10.0	44	176	7
Beryllium	Oil	0.0001	0.0005	0.0018	0.0004

\*Based on 8,760 hours of full load operation per year.

NOTE: The emissions are for operation at sea level and 59 F.

TABLE 2

QUC Indian River Plant Combustion Turbines  
 Maximum Air Quality Impacts for Comparison  
 To the De minimus Ambient Levels and the  
 Significant Impact Levels

Pollutant and Averaging Time	Predicted Impact (ug/m <sup>3</sup> )	De minimus Ambient Impact Level (ug/m <sup>3</sup> )	PSD Significant Impact Level (ug/m <sup>3</sup> )
PM (24-hour)	0.4	10	5
PM (Annual)	<0.1	--	1
SO <sub>2</sub> (3-hour)	20.3	--	25
SO <sub>2</sub> (24-hour)	5.0	13	5
SO <sub>2</sub> (Annual)	0.4	--	1
NO <sub>2</sub> (Annual)	0.3	14	1
CO (1-hour)	1.6 (1)	--	2000
CO (8-hour)	1.4 (2)	575	500

- (1) 1-hour concentration is based on (3-hour impact)/0.9.  
 (2) 8-hour concentration is based on the 3-hour impact.

Best Available Control Technology (BACT) Determination  
Orlando Utilities Commission  
Brevard County

The applicant proposes to install up to four new simple cycle combustion turbines at the Indian River Plant located about 10 km south of Titusville, Florida. The project includes the installation of two 35 MW (approximate rating at site conditions) combustion turbine generators, with provisions for the installation of up to two additional combustion turbine generators of similar size in the future. This application is being reviewed for the total proposed installation of four 35 MW units.

The combustion turbines are being designed for firing on either natural gas or No. 2 fuel oil. The applicant has indicated the annual tonnage of regulated air pollutants emitted from the four turbines based on 100 percent capacity and type of fuel firing to be as follows:

Pollutant	Maximum Potential Emissions (tons/year)		PSD Significant Emission Rate (tons/year)
	Natural Gas	Diesel Fuel	
NO <sub>x</sub>	1,320	2,070	40
SO <sub>2</sub>	6.0	2,500	40
PM	44	175	25
PM <sub>10</sub>	44	175	15
CO	175	177	100
VOC	70	70	40
Sulfuric Acid Mist	-	176	7
Beryllium	-	0.0018	0.0004

Florida Administrative Code Rule 17-2.500(2)(f)(3) requires a BACT review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in the previous table.

BACT Determination Requested by the Applicant

The BACT determinations requested by the applicant on a pollutant by pollutant basis are given below:

Pollutant	Determination
NO <sub>x</sub>	42 ppmvd @ 15% O <sub>2</sub> (natural gas firing) 65 ppmvd @ 15% O <sub>2</sub> (diesel oil firing)
SO <sub>2</sub>	Low sulfur fuel (natural gas, diesel fuel with sulfur content not to exceed 0.30%)
PM and PM <sub>10</sub>	Firing of natural gas and diesel oil
CO	10 ppmvd @ 15% O <sub>2</sub>
VOC	7 ppmvd @ 15% O <sub>2</sub>
Sulfuric Acid Mist	Firing of natural gas and diesel oil
Beryllium	Firing of natural gas and diesel oil

Date of Receipt of a BACT application:

May 5, 1988

Review of Group Members:

This determination was based upon comments received from the applicant, EPA Region IV, and the Stationary Source Control Section.

BACT Determination Procedure:

In accordance with Florida Administrative Code Chapter 17-2, Air Pollution, this BACT determination will be based on the maximum degree of reduction of each pollutant emitted which the Department (DER), on a case-by-case basis taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that in making the BACT determination the Department shall give consideration to:

- (a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 10 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).
- (b) All scientific, engineering, and technical material and other information available to the Department.

- (c) The emission limiting standards or BACT determinations of any other state.
- (d) The social and economic impact of the application of such technology.

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

BACT Determined by DER:

Pollutant	Emission Limit
NOx	42 ppmvd @ 15% O <sub>2</sub> (natural gas firing) 65 ppmvd @ 15% O <sub>2</sub> (natural gas firing)
SO <sub>2</sub>	Emissions limited by natural gas and diesel oil firing (sulfur content not to exceed 0.30%)
PM & PM <sub>10</sub>	Emissions limited by natural gas and diesel oil firing (sulfur content not to exceed 0.30%)
CO	10 ppmvd @ 15% O <sub>2</sub>
VOC	7 ppmvd @ 15% O <sub>2</sub>
Sulfuric Acid Mist	Emissions limited by natural gas and diesel oil firing
Beryllium	Emissions limited by natural gas and diesel oil firing

BACT Determination Rationale

The Department has determined that the application as submitted represents BACT for this facility. In accordance with the "top down" BACT approach, an economic analysis has indicated that the control measures which are available to provide the highest emissions reductions are prohibitively expensive and thereby are

not justified as BACT. These control options are investigated on a pollutant-by-pollutant basis as follows.

The applicant has stated that BACT for nitrogen oxides will be met by using water or steam injection necessary to limit emissions to 65 ppmvd or 42 ppmvd at 15 percent oxygen when burning distillate fuel or natural gas, respectively.

A review of the EPA's BACT/LAER Clearinghouse - A Compilation of Control Technology Determinations (1985 edition) and its May 1986 and 1987 supplements indicates that the lowest NO<sub>x</sub> emission limit established to date for a combustion turbine is 4.5 ppmvd at 15 percent oxygen. This level of control was accomplished through the use of water injection and a selective catalytic reduction (SCR) system.

Selective catalytic reduction is a post-combustion method for control of NO<sub>x</sub> emissions. The SCR process combines vaporized ammonia with NO<sub>x</sub> in the presence of a catalyst to form nitrogen and water. The vaporized ammonia is injected into the exhaust gases prior to passage through the catalyst bed. The SCR process can achieve up to 90 percent reduction of NO<sub>x</sub> with a new catalyst. As the catalyst ages, the maximum NO<sub>x</sub> reduction will decrease to approximately 86 percent.

In order to justify the cost effectiveness of any air pollution control, the EPA has developed costing guidelines to obtain the highest reduction of emissions per dollar invested. Achievement of maximum emission reductions for capital invested is a major consideration when New Source Performance Standards (NSPS) are developed by the EPA. For NO<sub>x</sub> emissions, EPA has determined that a cost of up to \$1,000 per ton of emissions controlled (\$0.50/lb) is reasonable for NSPS. The cost guideline can be used as a screening technique for justifying BACT since federal regulations require that BACT determinations be at least as stringent as NSPS.

The applicant has stated that the installation and operation a SCR system designed to reduce post-combustion emissions by 86 percent would result in an annualized cost of approximately \$4.4 million. Based on continuous full load operation, the amount of NO<sub>x</sub> reduction achieved by the SCR system would be a maximum of 1,780 tons per year (emissions based on oil firing). Taking this reduction into consideration with the annualized cost of \$4.4 million, the cost per ton of NO<sub>x</sub> controlled is approximately \$2,472. This cost is well above the \$1,000 per ton guideline and does not appear to be reasonable as BACT.

For sulfur dioxide emissions, a review of the BACT/LAER Clearinghouse indicates that BACT has been represented by the firing of low sulfur content fuel. These sulfur content

limitations are typical for the firing of fuel oil only, since the sulfur content of natural gas is inherently very low.

As part of the "top down" BACT process the applicant has completed an economic analysis of using a flue gas desulfurization (FGD) system which would provide the maximum possible level of control for SO<sub>2</sub> even though it has not been a BACT requirement previously. According to the applicant, the annualized cost of a wet limestone (FGD) system which is capable of reducing SO<sub>2</sub> emissions by 70 percent would be approximately \$11.8 million. Based on continuous full load operation, the amount of SO<sub>2</sub> reduction achieved by the FGD system would be a maximum of 1,750 tons per year for oil fuel operation. In addition to the SO<sub>2</sub> control, a FGD system would also provide control for the pollutants beryllium and sulfuric acid mist, which require BACT for this facility, and several other pollutants. These pollutants have been identified as being emitted from gas/oil fired turbines as contained in the EPA publications entitled, "Compiling Air Toxics Emission Inventories" and "Control Technologies for Hazardous Air Pollutants."

The total tonnage of pollutants which would be controlled by the FGD system amount to approximately 1,905 tons per year for oil fired operation. Taking this reduction in consideration with the annualized cost of \$11.8 million the cost per ton of pollutants controlled is approximately \$6,194. This cost is well above the \$2,000 per ton guideline (NSPS guideline for SO<sub>2</sub> emissions) and does not appear to be reasonable as BACT.

As the BACT alternative for SO<sub>2</sub> emissions, the applicant has proposed to use fuel oil with a sulfur limitation of 0.30 percent. Limiting the oil's sulfur content is the common method of establishing BACT for SO<sub>2</sub> emissions from oil fired turbines.

The BACT/LAER Clearinghouse lists sulfur content limitations for burning oil in turbines that range from 0.1 to 0.5 percent. The applicants request that the turbine be allowed to burn fuel oil with a sulfur content of 0.30 percent maximum is consistent with the majority of the sulfur content limitations, and is thereby judged to be reasonable for BACT.

With regard to the pollutants carbon monoxide, volatile organic compounds and particulate matter, the BACT/LAER Clearinghouse documents do not list any combustion turbine projects with more stringent emission requirements than what has been proposed by the applicant.

The emissions of CO, VOC and PM are minimized by ensuring as complete combustion as possible. The equipment manufacturer has guaranteed that the CO and VOC emissions will not exceed 10 ppmvd and 7 ppmvd at 15 percent oxygen, respectively. These levels are consistent with previous BACT determinations and are judged to



represent BACT for this facility. These good combustion practices will also ensure that the toxic organic compounds will be minimized.

The emissions of particulates (TSP and PM<sub>10</sub>) will be minimized by the inherent qualities of the fuel. Both natural gas and distillate oil contain only trace quantities of particulate. As is the case, BACT for particulates is satisfied by the use of these fuels in the combustion turbine.

Dispersion modeling indicates that the maximum predicted impacts from the facility with the level of control proposed by the applicant will be well below the Ambient Air Quality Standards for all of the averaging periods. As is the case, the impacts associated with firing either natural gas or distillate fuel in the combustion turbines are not perceived to be a threat to air quality.

### Conclusion

The Department has determined that the level of control proposed by the applicant for the gas turbine facility represents BACT in all cases. The "top down" BACT approach has indicated that the more efficient than proposed control measures are too costly to warrant as being BACT for this facility. The control level as proposed is as efficient as any previous controls required for gas/oil fired turbines with the exception of units in California which were required to utilize selective catalytic reduction. Although additional NO<sub>x</sub> control could be achieved by further increasing the water/steam injection rate, it has been demonstrated that higher than proposed levels would be detrimental to the combustor and are not appropriate. In addition it should be noted that the maximum emission rates and the economic analysis have been based on operating the turbines with distillate oil as the combustion fuel. It is anticipated that natural gas will be the primary fuel, thereby resulting in actual emissions rates which are well below the maximum projections.

### Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator  
Department of Environmental Regulation  
Bureau of Air Quality Management  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

(Orlando Utilities Commission)

Recommended by:

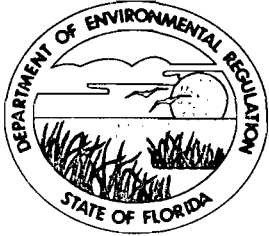
\_\_\_\_\_  
C.H. Fancy, P.E.  
Deputy Bureau Chief, BAQM

\_\_\_\_\_ 1988  
Date

Approved by:

\_\_\_\_\_  
Dale Twachtmann, Secretary

\_\_\_\_\_ 1988  
Date



# Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

PERMITTEE:  
Orlando Utilities Commission  
500 South Orange Avenue  
Orlando, Florida 32802

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Expiration Date: January 31, 1992

County: Brevard

Latitude/Longitude: 28° 29' 32"N  
80° 46' 59"W

Project: Combustion Turbine  
Facility Units 1, 2, 3, & 4

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

For the construction of four simple cycle GE Frame 6 combustion turbines, each with about 35 MW capacity, at the existing Indian River Plant, Brevard County, Florida. The turbines will be capable of being fired by both natural gas and distillate oil. Nitrogen oxide emissions will be controlled by water injection. The PSD permit number for this project is PSD-FL-130.

Construction shall be in accordance with the permit application and plans, documents, and reference material submitted unless otherwise stated in the Preliminary Determination and Technical Evaluation or the General and Specific Conditions herein.

#### Attachments:

1. OUC's application package dated January 18, 1988.
2. DER's letter concerning application fees dated February 15, 1988.
3. DER's letter for additional information dated March 10, 1988.
4. DER's letter containing EPA's comments dated March 18, 1988.
5. OUC's letter received April 18, 1988.
6. Black & Veatch (B & V) letter received May 5, 1988.
7. OUC letter received May 13, 1988.
8. B & V letter received May 18, 1988.
9. B & V letter received June 13, 1988.
10. B & V letter received June 16, 1988.
11. B & V letter received June 21, 1988.
12. Fish & Wildlife Service letter received July 5, 1988.

PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Expiration Date: January 31, 1992

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Expiration Date: January 31, 1992

GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

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

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

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

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

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

PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Expiration Date: January 31, 1992

GENERAL CONDITIONS:

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

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

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

- (x) Determination of Best Available Control Technology (BACT)
- (x) Determination of Prevention of Significant Deterioration (PSD)
- (x) Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

- a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Expiration Date: January 31, 1992

**GENERAL CONDITIONS:**

- b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.
- c. Records of monitoring information shall include:
- the date, exact place, and time of sampling or measurements;
  - the person responsible for performing the sampling or measurements;
  - the date(s) analyses were performed;
  - the person responsible for performing the analyses;
  - the analytical techniques or methods used; and
  - the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

**SPECIFIC CONDITIONS:**

1. Each turbine may operate continuously (8760 hours/year).
2. Only natural gas or distillate oil shall be fired in the turbine. Distillate oil shall be used in periods of curtailed natural gas supply.
3. The maximum heat input to each turbine shall not exceed 112 MMBtu/hr.

PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751  
Expiration Date: January 31, 1992

SPECIFIC CONDITIONS:

4. The maximum allowable emissions from the turbine(s) in accordance with the BACT determination, shall not exceed the following:

<u>Pollutant</u>	<u>Fuel</u>	<u>Maximum</u>	<u>Potential Annual</u>	
		<u>Emissions</u>	<u>Emissions</u>	
		<u>Per Unit</u>	<u>1 unit</u>	<u>4 Units</u>
		<u>lb/h</u>	<u>t/yr</u>	<u>t/yr</u>
Carbon Monoxide	Gas	10.0	43.8	175
	Oil	10.1	44.2	177
Nitrogen Oxides	Gas	75.1	328.9	1,316
	Oil	118.3	518.2	2,073
Sulfur Dioxide	Gas	0.34	1.5	6
	Oil	142.7	625.0	2,500
Total Particulates	Gas	2.5	11.0	44
	Oil	10.0	43.8	175
PM <sub>10</sub>	Gas	2.5	11.0	44
	Oil	10.0	43.8	175
VOC	Gas	4.0	17.5	70
	Oil	4.0	17.5	70
Sulfuric Acid Mist	Oil	10.0	44.0	176
Beryllium	Oil	0.0001	0.0005	0.0018

Visible emissions shall not exceed 5% opacity while burning natural gas or 10% opacity while burning distillate oil.

5. The distillate oil sulfur content shall not exceed 0.3% by weight.

6. Water injection shall be utilized for NOx control. The water to fuel ratio at which compliance is achieved shall be incorporated into the permit, and shall be monitored.



PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Expiration Date: January 31, 1992

SPECIFIC CONDITIONS:

7. Both start and black start capability shall be provided by a No. 2 fuel oil fired 800 HP internal combustion diesel (for each turbine), projected to run for approximately 10 minutes per start. These diesels are expected to emit minimal air emissions eg. 15 lbs SO<sub>2</sub>/year per unit.

8. Initial (I) and annual (A) compliance tests shall be conducted with the fuel(s) used in the preceding 12 month period using EPA method:

- a. 20 for NO<sub>x</sub> and SO<sub>2</sub> (I,A)
- b. 10 for CO (I)
- c. 5/17 for PM (I)
- d. 9 for VE (I,A)
- e. 104 for Beryllium (I)

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

9. The project shall comply with all the applicable requirements of Chapter 17-2, Florida Administrative Code and 40 CFR 60 Subpart GG, Gas Turbines.

10. DER's Central Florida District Office shall be notified in writing 15 days prior to source testing. Written reports of the tests shall be submitted to the Central Florida District Office within 45 days of test completion.

The construction shall reasonably conform to the plans and schedule submitted in the application. If the permittee is unable to complete construction on schedule, the Department must be notified in writing 60 days prior to the expiration of the construction permit and submit a new schedule and request for an extension of the construction permit, (Rule 17-2, FAC).

To obtain a permit to operate, the permittee must demonstrate compliance with the conditions of the construction permit and submit a complete application for an operating permit, including the application fee, along with compliance test results and Certificate of Completion, to the Department's Central Florida District Office 90 days prior to the expiration date of the construction permit. The permittee may continue to operate in compliance with all terms of the construction permit until its expiration date. Operation beyond the construction permit expiration date requires a valid permit to operate (Rules 17-2 and 17-4, FAC).

PERMITTEE:  
Orlando Utilities Commission

Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Expiration Date: January 31, 1992

**SPECIFIC CONDITIONS:**

If the construction permit expires prior to the permittee requesting an extension or obtaining a permit to operate, then all activities at the project must cease and the permittee must apply for a new permit to construct which can take up to 90 days to process a complete application (Rule 17-4, FAC).

11. Any change in the method of operation, fuels, equipment or operating hours shall be submitted for approval to the DER's Central Florida District Office.

12. The control technology and allowable emission limits for turbines 3 and 4 shall be reviewed and modified, if necessary, by the Bureau of Air Quality Management, at the latest reasonable time which occurs no later than 18 months prior to commencement of construction of the unit. The proposed schedule indicates construction commencement dates of November 1988 for units 1 and 2, November 1989 for unit 3, and November 1990 for unit 4.

Issued this \_\_\_\_\_ day of \_\_\_\_\_, 1988

STATE OF FLORIDA DEPARTMENT OF  
ENVIRONMENTAL REGULATION

\_\_\_\_\_  
Dale Twachtmann, Secretary



United States Department of the Interior  
FISH AND WILDLIFE SERVICE

*File Copy*  
TAKE PRIDE IN AMERICA

MAILING ADDRESS:  
Post Office Box 25486  
Denver Federal Center  
Denver, Colorado 80225

STREET LOCATION:  
134 Union Blvd.  
Lakewood, Colorado 80228

IN REPLY REFER TO:

RW AIR QUALITY  
MAIL STOP 60130

JUL 01 1988

RECEIVED

JUL 05 1988

DER-BAQM

Pradeep Raval  
Bureau of Air Quality Management  
Department of Environmental Regulation  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Dear Mr. Raval:

We have reviewed the Orlando Utilities Commission's Prevention of Significant Deterioration application to add gas turbines to the Indian River Plant. The proposed project would be located 175 km east of Chassahowitzka National Wildlife Refuge, a class I area administered by the U.S. Fish and Wildlife Service. The source, under Prevention of Significant Deterioration regulations, would be a major source of carbon monoxide, nitrogen oxides, and sulfur dioxide, and a significant emitter of total particulates, PM-10 and volatile organic compounds. Considering the long distance of the Orlando Utilities source to Chassahowitzka National Wildlife Refuge, we do not anticipate emissions from this source having any adverse impacts on resources at the refuge.

We would like to take this opportunity to thank the Florida Department of Environmental Regulation for the letter of May 6, 1988, regarding the Pasco County resource recovery facility and look forward to receiving the list of sources within 100 kilometers of Chassahowitzka you are developing per our request in our Pasco County application response. In our response to the Pasco County application we also requested a revised modeling analysis of the class I sulfur dioxide increment consumption since the application indicated that 98 percent of the maximum allowable 24-hour sulfur dioxide increment had been consumed. Because the revised modeling analysis indicated that the 24-hour sulfur dioxide increment consumption was reduced from 98 percent to 52 percent, we feel confident that the class I increment is not being exceeded at the Chassahowitzka National Wildlife Refuge. However, since there appears to be a large number of sulfur dioxide sources in the area around Chassahowitzka, we would like to request that the State perform regional scale modeling and monitoring of sulfur dioxide to determine current total sulfur dioxide levels at the refuge.

If you have any questions, please contact Miguel Flores at 303-969-2072.

Sincerely,

*Nelson B. Kverno*

Nelson B. Kverno  
Assistant Regional Director  
Refuges and Wildlife, Region 6

*copied: Sam Rogers  
Mary Jean  
Carr, Andrews  
CHF/ST*

*for*

06/21/88

11:27

B&V PWR DIV 913 339 7218

001

Best Available Copy

6/21

file  
called  
1:40 pm  
6/24 pm called

BLACK & VEATCH  
ENGINEERS-ARCHITECTS

TEL. (913) 339-2000

RECEIVED

JUN 23 1988

1500 MEADOW LAKE PARKWAY  
MAILING ADDRESS P.O. BOX NO. 1  
KANSAS CITY, MISSOURI 64116

FACSIMILE TRANSMISSION REQUEST

PROVIDE INFORMATION REQUESTED USING BLACK INK

DO NOT STAPLE

DATE 6/21/88

TRANSMIT TO: NAME BARRY ANDREWS  
COMPANY FLORIDA DEM

NUMBER OF PAGES TRANSMITTED INCLUDING THIS COVER SHEET 4

TELEPHONE NUMBER OF RECEIVING EQUIPMENT 904-487-3618

IF AUTOMATIC, VERIFICATION TELEPHONE NUMBER \_\_\_\_\_

FROM JOHN COCHRAN

LOCATION PAC TELEPHONE NUMBER 913-339-2190

PROJECT NAME OUC - INDIAN RIVER

PROJECT NUMBER 14137.031 PHASE \_\_\_\_\_

NOTE TO RECEIVING OPERATOR: IN THE EVENT TRANSMISSION IS NOT COMPLETE,  
PLEASE CALL (913) 339-7218

BLACK & VEATCH FAX (913) 339-2934

copied Barry  
Pradeep  
Max  
T. Sanicki  
W. Aronson  
CHF/BT  
} 6-23-88 PR

BLACK & VEATCH  
ENGINEERS-ARCHITECTS



Owner \_\_\_\_\_ Computed By \_\_\_\_\_  
 Plant \_\_\_\_\_ Unit \_\_\_\_\_ Date \_\_\_\_\_  
 Project No. \_\_\_\_\_ File No. \_\_\_\_\_ Checked By \_\_\_\_\_  
 Title \_\_\_\_\_ Date \_\_\_\_\_  
 Page \_\_\_\_\_

6/21/88

Barry,

Here are the calculations necessary to convert NO<sub>x</sub> ppm to %hr. Gas flows are based on information from General Electric for a Frame 6 based on a 59 F inlet temperature. Gas flows change substantially for changes in inlet temperature. If you have any further questions please call me at 913-339-2190.

RECEIVED

Sincerely  
 John Cochran

DO NOT WRITE IN THIS SPACE

BLACK & VEATCH ENGINEERS ARCHITECTS



Owner DUC Computed By [Signature]  
 Plant Indias River Date 6/20  
 Project No. 14137 File No. \_\_\_\_\_ Checked By [Signature]  
 Title NO<sub>x</sub> Emissions Date 6/21  
 Page \_\_\_\_\_

Natural Gas Fired Frame G:

Exhaust Analysis - 42 ppm NO<sub>x</sub> Emission Rate

	<u>% Vol</u>	<u>mol/hr</u>	<u>Converted to 15% O<sub>2</sub> - Dry</u>
Nitrogen	72.55	28997	31,170
Oxygen	13.02	5186	5790
Carbon Dioxide	3.25	1294	1294
Water	10.31	—	—
Argon	<u>0.87</u>	<u>347</u>	<u>347</u>
Total	100.00	35,724	38601
Flue Gas Flow	1,126,000 lb/hr		
Molecular Weight	28.27 lb/mol		

$$NO_x, \text{ lb/hr} = \left( \frac{42 \text{ mol } NO_x}{10^6 \text{ mol F.G.}} \right) \left( 38601 \frac{\text{mol F.G.}}{\text{hr}} \right) \left( 46 \frac{\text{lb } NO_x}{\text{mol}} \right) = 75 \frac{\text{lb}}{\text{hr}}$$

DO NOT WRITE IN THIS SPACE

BLACK & VEATCH ENGINEERS ARCHITECTS



Owner DUC Computed By [Signature]  
 Plant Indian River Unit \_\_\_\_\_ Date 6/20  
 Project No. A137 File No. \_\_\_\_\_ Checked By H.E.  
 Title NOx Emissions Date 6/21  
 Page \_\_\_\_\_

Fuel Oil Fuel Frame 6:

Exhaust Analysis - 65 ppm NOx Emission Rate

	<u>% Vol</u>	<u>mol/hr</u>	<u>Converted to 15% O<sub>2</sub> - Dry</u>
Nitrogen	73.50	28877	31,652
Oxygen	13.24	5202	5,940
Carbon Dioxide	4.23	1662	1,662
Water	8.15	—	—
Argon	<u>0.88</u>	<u>346</u>	<u>346</u>
Total	100.00	36,087	39,600

Flue Gas Flow 1,126,000 <sup>lb</sup>/hr

Molecular Weight 28.66 <sup>lb</sup>/mol

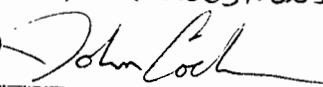
$$NO_x, \frac{lb}{hr} = \left( \frac{65 \text{ mol } NO_x}{10^6 \text{ mol FG}} \right) \left( 39,600 \frac{\text{mol FG}}{\text{hr}} \right) \left( 46 \frac{\text{lb } NO_x}{\text{mol } NO_x} \right) = 118 \frac{\text{lb}}{\text{hr}}$$

DO NOT WRITE IN THIS SPACE

BARRY,

6/15/88

ATTACHED PLEASE FIND A DRAFT  
OF THE NEW HAZARDOUS AIR POLLUTANTS  
SECTION FOR THE OUC INDIAN RIVER  
PERMIT, ALSO WRITTEN ON TABLE 4-4  
IS THE METHODOLOGY USED TO CALCULATE  
EMISSIONS. I WILL CALL TOMORROW TO  
SEE IF YOU HAVE ANY FURTHER QUESTIONS.

Sincerely, 



particulate. A review of the EPA's BACT/LAER Clearinghouse documents did not reveal any post combustion particulate control technologies being used on gas/oil fueled combustion turbines. The natural gas and distillate oil fuels to be used in the proposed combustion turbines will only contain trace quantities of particulate. Therefore, OUC's standard operating procedures will ensure as complete combustion of the fuel as possible and is the proposed BACT for suspended particulate, and particulate matter smaller than 10 microns (PM<sub>10</sub>).

#### 4.5 OTHER CRITERIA AND NON-CRITERIA POLLUTANT EMISSIONS

Section 4.3 addressed removal of other criteria and non-criteria pollutants as a part of flue gas desulfurization. It was determined in Section 4.3 that based on energy, environmental, and economic considerations flue gas desulfurization was not an appropriate choice for the OUC Indian River Combustion Turbine Project.

Table 4-4 lists the estimated emission of other criteria and non-criteria pollutants based on good combustion of the fuel and the inherent quality of the fuel. Emission estimates indicate that significance levels are exceeded for beryllium and sulfuric acid mist. Significance levels do not represent emission limitations, but rather are indicators of whether a BACT review is necessary.

Other than flue gas desulfurization, there are no identified methods for controlling the emission of these pollutants, other than complete combustion of the fuel and the inherent quality of the fuel. Sulfuric acid mist emissions are a direct function of the sulfur content of the fuel. As discussed in Section 4.3, the sulfur content of the fuel oil will be controlled to 0.3 percent. Therefore, based on the results of Section 4.3, BACT regarding beryllium and sulfuric acid mist is complete combustion of the fuel and the inherent quality of the fuel.

RECEIVED

JUN 16 1988

DER - BAQM

FROM  
**BLACK & VEATCH**  
ENGINEERS-ARCHITECTS

P.O. BOX 8405

KANSAS CITY, MO. 64114

---

Mr. Barry Andrew  
Department of Environmental Regulations  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

TABLE 4-4. OTHER CRITERIA AND NON-CRITERIA POLLUTANT EMISSIONS

<u>Pollutant</u>	<u>Emission Rate</u> lb/MBtu	<u>Annual Emission*</u> tpy	<u>PPM</u>
Antimony	5.1 E-7	3.9 E-3	0.01
Arsenic	2.9 E-6	0.022	0.058
Barium	2.5 E-8	1.9 E-4	0.005
Beryllium**	2.3 E-7	1.8 E-3	0.0046
Cadmium	1.7 E-4	1.3	3.3
Chlorine	7.5 E-5	0.57	1.47
Chromium	1.2 E-4	0.92	2.3
Cobalt	1.5 E-5	0.11	0.30
Copper	1.5 E-5	0.11	0.30
Fluoride**	5.6 E-5	0.44	1.1
Formaldehyde	1.9 E-4	1.5	37
Lead**	9.5 E-6	0.07	0.19
Manganese	1.4 E-6	0.010	0.027
Mercury**	1.1 E-5	0.084	0.22
Nickel	1.1 E-5	0.084	0.224
Sulfuric Acid Mist**	0.023	176	
Vanadium	8.4 E-3	64	165

**PRELIMINARY**

\*Annual emissions are total for four combustion turbines, and are based on 100 percent capacity factor burning distillate fuel oil.

\*\*The following are the PSD significance levels for the remaining criteria pollutants.

- Beryllium 0.0004 tpy
- Fluoride 3 tpy
- Lead 0.6 tpy
- Mercury 0.1 tpy
- Sulfuric acid mist 7 tpy

$$\text{lb/MBtu Emission} = \left( \text{PPM}, \frac{\text{lb}}{10^6 \text{lb Coal}} \right) \left( \frac{\text{lb Coal}}{19700 \text{ BTU}} \right) \left( 10^6 \frac{\text{BTU}}{\text{MBtu}} \right)$$

$$\text{tpy Emission} = \left( \text{Emission}, \frac{\text{lb}}{\text{MBtu}} \right) \left( 4 \times 436 \frac{\text{MBtu}}{\text{hr}} \right) \left( 8760 \frac{\text{hr}}{\text{yr}} \right) \left( \frac{\text{ton}}{2000 \text{ lb}} \right)$$

CC: CHF/BT  
Pradeep Raval  
6-16-84 Max Linn  
T. Sawicki - CFDist  
061488

Judicial Express File Copy  
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TEL. (913) 339-2000

1500 MEADOW LAKE PARKWAY  
MAILING ADDRESS P.O. BOX NO. 8405  
KANSAS CITY, MISSOURI 64114

Orlando Utilities Commission  
Indian River Plant  
PSD Permit No. 05-144482

B&V Project 14137.031  
B&V File 22.0400  
June 10, 1988

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**JUN 13 1988**

**DER-BAQM**

Bureau of Air Quality - Florida DER  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

Attention: Mr. Barry Andrews

Gentlemen:

Values for sulfur dioxide emissions when burning natural gas as listed in Table 3-1 of the Indian River permit are in error. The correct SO<sub>2</sub> emission estimates based on use of emission factors contained in AP-42 are as follows.

- Maximum SO<sub>2</sub> Emissions Per Unit = 0.34 lb/hr
- Potential Annual SO<sub>2</sub> Emissions = 1.5 tpy/unit
- Total Plant Potential SO<sub>2</sub> Emission = 6.0 tpy (4 units)

We are sorry for any confusion that these erroneous emission estimates have caused during your review of the Indian River permit. If you have any other questions, please call either myself (913-339-2880) or John Cochran (913-339-2190). Thank you for your time and efforts in the review of our permit.

Very truly yours,

BLACK & VEATCH

*S. M. Day/888*

Steven M. Day

JRC:jrc

- cc: W. H. Herrington, OUC
- J. S. Crall, OUC
- T. D. Slepow, OUC
- Janet Hayward, EPA Region IV
- Chun (Gary) NG, EPA Region IV

CHFBT  
 Pradeep Royel  
 Max Linn  
 Barry Andrews  
 T Sawicki - CF Dist } 6.14.88

FROM  
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P.O. BOX 8405

KANSAS CITY, MO. 64114

---

Bureau of Air Quality - Florida DER  
Attention: Mr. Barry Andrews  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

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Orlando Utilities Commission  
Indian River Plant  
PSD Permit No. 05-144482

**RECEIVED**

B&V Project 14137.031  
B&V File 22.0400  
May 17, 1988

MAY 18 1988

Mr. Barry Andrews  
Bureau of Air Quality - Florida DER  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

**DER-BAQM**

FEDERAL EXPRESS

Dear Mr. Andrews:

We hope that information submitted to your office on Friday May 13, 1988 is helpful in your consideration of our BACT submittal. The NO<sub>x</sub> abatement information by General Electric should be especially beneficial for the review of any combustion turbine permit.

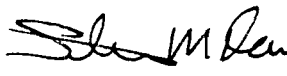
During our review of OUC's revised BACT analysis we have found an error. The volatile organic compound (VOC) emission rate stated in the permit application and the BACT analysis does not match the guarantee in OUC's contract agreement with GE. Emission guarantees from GE assure that VOC emissions will be no greater than 7 ppmvw from the Frame 6 combustion turbines. This emission corresponds to an emission rate of 0.009 lb/MBtu or 4.0 lb/hr, rather than the 5 ppmvd stated in the permit application. General Electric is unwilling to guarantee VOC emissions below 7 ppmvw. The application already correctly specifies 4.0 lb/hr as the maximum emission rate, and therefore, Table 3-1 requires no modification.

BACT/LAER Clearinghouse documents do not list any combustion turbine projects with more stringent emission requirements than 0.013 lb/MBtu. Therefore, the use of combustion turbines designed to meet a VOC emission rate of 7 ppmvw at 15 percent oxygen (lower than any other Clearinghouse limit) is proposed as BACT, rather than the previously incorrectly specified 5 ppmvd.

If you have any questions regarding VOC emissions or any other topics pertaining to the review of our BACT analysis please call either myself (913-339-2880) or John Cochran (913-339-2190). Thank you for your time and efforts in the review of our permit.

Very truly yours,

BLACK & VEATCH

  
Steven M. Day

JRC:jrc

cc: Janet Hayward, EPA Region IV  
Chun (Gary) NG, EPA Region IV  
J. S. Crall, OUC

W. H. Herrington, OUC  
T. D. Slepov, OUC

Copy: Barry Andrews  
Barry Andrews  
T. Cochran  
11/1/88

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P.O. BOX 8405

KANSAS CITY, MO. 64114

Mr. Barry Andrews  
Bureau of Air Quality - Florida DER  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

66643

Hand Delivered  
From B Andrews  
Rec'd 5.19.88

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## ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 305/423-9100

May 13, 1988

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Bureau of Air Quality Management  
Department of Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32304

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MAY 13 1988

DER-BAQM

ATTN: Barry Andrews

Subject: Orlando Utilities Commission  
Indian River Plant CT. Project  
PSD Permit No. 05-144482

Dear Mr. Andrews:

I was pleased with the favorable comments expressed by the Department, during our meeting of May 9, regarding the top-down BACT determination as performed by our consultant Black & Veatch. As you recommended, I requested GE supply test data for the MS 6000 CT equating combustion dome erosion life to water flow rate, to achieve NO<sub>x</sub> emissions at both 25 ppmvd and 42 ppmvd, as performed by another applicant for the LM 2500/5000 CT.

I contacted GE on May 10 and they stated:

1. The combustor dome life characteristics with water injection, as exists for the LM 2500 and LM 5000, is not applicable to the GE heavy duty turbines.
2. GE will not guarantee the MS 6000 if additional water necessary to reach 25 ppmvd (natural gas fuel at 15% O<sub>2</sub>) is used. They addressed not only the potential of unacceptable reduction in the life of the combustion chamber seals and other internal components, but, a special problem that exists with splashdown on the hot combustion liner metal. GE is unwilling to supply specific test data regarding this problem and considers it proprietary.
3. GE also provided a list of MS 6000's operating in the United States with respective NO<sub>x</sub> levels.

A copy of GE's letter regarding these points is attached for your review.



May 13, 1988  
Page Two

As stated in S.M. Day's letter of May 5, 1988 to Clair Fancy, the scheduled start construction date is October 3, 1988. I will need an affirmative on this permit no later than August in order to receive Commission Approval so as not to delay the project. As you are aware the permit was submitted in January, the Department did the completeness review March 10 and we have answered all questions including the top-down BACT. Our consultants and I are willing to cooperate in any way necessary to expedite issuance.

Sincerely,



J.S. Crall  
Director  
Environmental Division

JSC:sp

Attachments

xc: W.H. Herrington  
K.P. Ksionek  
T.D. Slepow  
C.F. Fancy, Deputy Chief BQAM (DER)  
Don Schultz, B&V  
Steve Day, B&V  
T.J. Schoenholz, GE

Turbine Technology Department  
One River Road  
Schenectady, NY 12345

Copies: Pradeep Raval  
Max Finn  
Barry Andrews  
T. Schucki - CF Dist.  
CMF/BT

} 5-19-88

# GENERAL ELECTRIC

TURBINE TECHNOLOGY DEPARTMENT • TURBINE BUSINESS OPERATIONS  
GENERAL ELECTRIC COMPANY • ONE RIVER ROAD • SCHENECTADY, NEW YORK 12345 • (518) 385-4523

May 12, 1988

Orlando Utilities Commission  
500 South Orange Avenue  
Orlando, Florida 32802

Attention: J. S. Crall  
Environmental Division

Subject: Orlando Utilities Commission  
Indian River CT Project  
Combustion Turbine Project  
B&V File 14137.62.1001.02

Message No.: GES/OUC/TJS/L-018

Dear Mr. Crall:

This letter will document our discussions on May 10, 1988 concerning the NOx abatement capability of the MS6000 gas turbines that are being provided for the Indian River combustion turbine project in Titusville, Florida.

- A. The Combustor Dome (Life Characteristics with Water Injection - LM2500 & LM5000) curve you Panafaxed to me on May 10, 1988 is not applicable to GE heavy duty gas turbines.
- B. GE's capability for NOx reduction burning natural gas fuel with water injection is 42 ppmvd (reference 15% O<sub>2</sub>). The allowable level of water injection is established by balancing the required NOx emission level, carbon monoxide emissions, and mechanical life of combustion chamber seals and components affected by dynamic pressure oscillations. The mechanical life for standard single fuel nozzle diffusion flame combustor system internals may be shortened to an unacceptable degree when water injection is further increased to reduce NOx below 42 ppmvd (reference 15% O<sub>2</sub>) due to liquid water splashing on hot combustion liner metal. GE is unable to supply any engineering or test data due to its proprietary nature.
- C. GE's capability for NOx reduction burning No. 2 distillate fuel oil is 42 ppmvd (reference 15% O<sub>2</sub>) with water injection. This level of water injection, however, adversely impacts the CO emissions. In addition, GE's concerns with regard to water splashing on the combustion liners (albeit to a lesser extent than on natural gas above) requires that the first combustion inspection be at 1500 fired hours. GE is unable to supply any engineering or test data due to its proprietary nature.

GENERAL  ELECTRIC

Page 2  
May 12, 1988

D. Lower NOx emission levels can be achieved with an MS7001EA equipped with a multi-fuel nozzle "quiet combustor" system. However, this gas turbine model was ruled out by Orlando Utilities Commission because it did not meet your project objectives.

Please call me if you need additional information regarding this subject.

Regards,

*Terry J. Schoenholz*

Terry J. Schoenholz  
Senior Engineer

/wb/4123w

cc: TD Slepow, Orlando Utilities  
KP Ksionek, Orlando Utilities  
DD Schultz, Black & Veatch (2)  
BW Goche, GE - Kansas City  
MD Morris, GE - Kansas City  
CH Nelson, GE - Schenectady 273-450  
WG Gibbons, GE - Schenectady 2-230C

## EMISSIONS GUARANTEES AND ESTIMATES FOR 5001'S IN THE U.S.

S. DATE	O. DATE	FAC	NAME LOCATION	FUEL	NOX CONTROL	NOX GUAR. PPM(DCS/HR)
1978		#245169	MONT DAK UTIL	OIL	NONE	225
1981		#202038	CTY LITTLE ROCK N. LITTLE ROCK, ARK	NO OIL	HTR HTR	75 75
1982		#202115	CROWN ZELLE ANTIOCH, CA	NO OIL	STM STM	42 42
1983		#202195	TEXACO/BECHTEL HOUSTON, TEXAS	NO	NONE	150
1984	0502	#202522	AMOCO CHEMICALS TEXAS CITY, TX	NO	STM	75
1984		#202527	INLAND CONTAINER	NO OIL	HTR HTR	42 65
1985		#202612	ALASKA ELEC SOLOOTNA, ALASKA	NO OIL	HTR HTR	75 75
1985		#202589	AMOCO CHEM CO CHOCOLATE BAYOU, TX	NO	STM	75
1985		#202566	BASF HYAND GEISMAR, LA	NO	NONE	150
1986		#295208	BORDEN CHEM GEISMAR, LA	NO	STM	75
1986	0652	#295235	BORDEN CHEM GEISMAR, LA	NO	STM	75
1986		#295301	CHEVRON EL SEGUNDO, CA	NO BUT PROP	STM STM STM	42 65 63
1986		#295302	CHEVRON EL SEGUNDO, CA	NO BUT PROP	STM STM STM	42 63 63
1986		#295187	KAYSER/GE SAN JOSE, CA	NO OIL	STM STM	42 65
1986		#295214	UNIVER. ENERGY TAFT, CA	NO	HTR	42
1987	0022	#295342	AMR VENTURE HARTFORD, CT	NO OIL	STM STM	42 62
1987	0099	#295326	COGEN TECH BAYONNE, NJ	NO DIST	HTR HTR	42 65
1987	0099	#295327	COGEN TECH BAYONNE, NJ	NO DIST	HTR HTR	42 65
1987	0099	#295328	COGEN TECH BAYONNE, NJ	NO DIST	HTR HTR	42 65
1987	0012	#295346	KOCH REFIN CORPUS CHRISTI, TX	CASE BASE	STM	42
1987		#295324	UNION CARBIDE SEADRIFT, TX	NO OIL	STM STM	75 75
1987		#295325	UNION CARBIDE SEADRIFT, TX	NO OIL	STM STM	75 75
1988	0052	#295424	CELANESE BISHOP, TX	NO OIL	STM STM	42 65
1988		#295359	ENCODEN ONE	NO	STM	42
1988	0911	#295361	EXXON CHEM CO BAYTOWN, TX	NO	STM	42
1988	0911	#295362	EXXON CHEM CO BAYTOWN, TX	NO	STM	42
1988	0911	#295363	EXXON CHEM CO BAYTOWN, TX	NO	STM	42
1988	9999	#295357	FINA OIL CO PORT ARTHUR, TX	NO RD	STM STM	50 65
1988	0951	#295429	ORLANDO UTIL INDIAN RIV, FLA	NO	HTR	42
1988	0959	#295430	ORLANDO UTIL INDIAN RIV, FLA	NO	HTR	42
1988	0043	#295358	PPITCHARD/T BAKERSFIELD, CA	NO	HTR	42
1988	1989	#295364	SOUTHEAST PAPER DUBLIN, GA	NO OIL	STM STM	100 100

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KANSAS CITY, MISSOURI 64114

Orlando Utilities Commission  
Indian River Plant  
PSD Permit No. 05-144482

MAY 05 1988  
DER-BAQM

B&V Project 14137.031  
B&V File 22.0400  
May 5, 1988

Mr. C. H. Fancy, Deputy Chief  
Bureau of Air Quality  
Florida Dept of Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

FEDERAL EXPRESS

Dear Mr. Fancy:

Enclosed are five copies of the revised BACT analysis for the OUC Indian River Plant Combustion Turbine Project PSD permit application. This revised BACT analysis has been prepared to comply with your request for a "top-down" BACT analysis. It is intended to completely replace the former Section 4.0 of the PSD application.

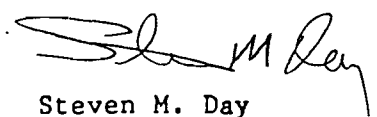
Construction of this facility is scheduled to begin on October 3 of this year. We are, therefore, most anxious for your review for completeness of the application. It is our understanding that this BACT analysis was the only outstanding issue necessary for your completeness determination.

OUC has requested that we meet with you next week at your offices to develop a mutually agreeable schedule for the remainder of the processing of this application. I will be calling to arrange a date and time for this meeting.

If you have any questions regarding this application, please call me at 913-339-2880 or Jim Crall of OUC at 305-423-9141.

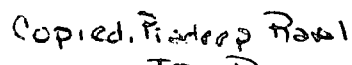
Very truly yours,

BLACK & VEATCH

  
Steven M. Day

SMD:lar  
Enclosure

- cc: Janet Hayward, EPA Region IV (Federal Express)
- Chun (Gary) Ng, EPA Region IV (Federal Express)
- W. H. Herrington, OUC
- T. D. Slepow, OUC
- J. S. Crall, OUC
- K. Kslonek, OUC

Copied.  }  
 Tom Rogers  
 Barry Andrews } 5688  
 CHFBT  
 Tom Sawicki

#### 4.0 BEST AVAILABLE CONTROL TECHNOLOGY

Previous sections of this application concluded that the project's emissions of nitrogen oxides, sulfur dioxide, carbon monoxide, volatile organic compounds, and particulate were subject to the provisions of the PSD Program. Consequently, this discussion of the appropriate best available control technology (BACT) for the project addresses control technologies/practices for these pollutants. In addition, an evaluation of non-criteria pollutants is included.

Under the federal Clean Air Act, BACT represents the maximum degree of pollutant reduction determined on a case-by-case basis after consideration of energy, environmental, and economic factors. However, BACT cannot be less stringent than the emission limits established by any applicable new source performance standard (NSPS). This BACT analysis follows the general requirements listed in the EPA Region 4 and 9 draft BACT guidance documents.

#### 4.1 COMBUSTOR TECHNOLOGY REVIEW

A primary objective for installation of the Indian River Combustion Turbines is for operating reserves. As a member of the Florida Coordinating Group (FCG), OUC is required to maintain approximately 45 MW of operating reserves. Up to 75 percent of these operating reserves can be supplied by quick start capacity which must be capable of providing the specified capacity to the grid within 10 minutes. The proposed General Electric (GE) Frame 6 combustion turbines have a startup time from cold start to full load of 9 minutes 40 seconds, and therefore, meet FCG requirements for nonspinning reserves. Each GE Frame 6, rated at approximately 35 MW, can individually meet the quick start or spinning operating reserve requirement of 34 MW.

If the GE Frame 6 combustion turbines are not installed, OUC would be required to meet FCG operating reserve requirements by committing additional steam generating capacity to spinning reserve. This additional committed capacity requires units to be operated at reduced loads resulting

in greater fuel consumption per kWh and higher total air emissions than by meeting these reserves with idle quick start capacity.

The GE "quiet combustor" was screened as a potential BACT alternative. However, the quiet combustor technology is not available on the GE Frame 6. It is available on the larger GE Frame 7, but the startup time for the GE Frame 7 combustion turbine is 20 minutes 30 seconds (disqualifying it for use as nonspinning operating reserves). Consequently, the GE Frame 7 (and thus the quiet combustor) was eliminated from consideration as BACT since it fails to meet a primary objective for the facility. Therefore, only GE Frame 6 combustion turbines will be considered in detail for this BACT analysis.

#### 4.2 NITROGEN OXIDE, CARBON MONOXIDE, AND VOC EMISSIONS

Due to the formation characteristics or kinetics of nitrogen oxides ( $\text{NO}_x$ ), carbon monoxide (CO), and volatile organic compounds (VOC) it is necessary to consider BACT concurrently for these emissions. Volatile organic compounds emissions from combustion turbines are typically expressed as total non-methane hydrocarbons.

During combustion, two types of  $\text{NO}_x$  are formed; fuel  $\text{NO}_x$  and thermal  $\text{NO}_x$ . Fuel  $\text{NO}_x$  emissions are formed through the oxidation of a portion of the nitrogen contained in the fuel. Thermal  $\text{NO}_x$  emissions are generated through the oxidation of a portion of the nitrogen contained in the combustion air. Nitrogen oxides formation can be limited by lowering combustion temperatures, and staging combustion (a reducing atmosphere followed by an oxidizing atmosphere).

Carbon monoxide and VOC are formed by incomplete combustion of the fuel. High combustion temperatures, adequate excess air and good fuel/air mixing during combustion will minimize emissions of CO and VOC. Carbon monoxide and VOC formation are limited by ensuring complete efficient combustion of the fuel in the turbines. Therefore, staging combustion and lowering combustion temperatures for  $\text{NO}_x$  emissions control can be counterproductive with regard to CO and VOC emissions.

#### 4.2.1 Nitrogen Oxides Emission Reduction Systems

A review of the EPA's BACT/LAER Clearinghouse - A Compilation of Control Technology Determinations (1985 edition) and its May 1986 and 1987 supplements indicated that the lowest NO<sub>x</sub> emission limit established to date for a combustion turbine is 4.5 ppmvd at 15 percent oxygen for a combustion turbine with a heat recovery steam generator located in California. That permit value was based on the use of water injection in the combustion turbine and a selective catalytic reduction (SCR) system following the heat recovery steam generator (combined cycle operation). Therefore, the most stringent emissions control alternative established for use with combustion turbines regarding NO<sub>x</sub> emissions is established as water injection with an SCR system.

Selective catalytic reduction is a post-combustion method for control of NO<sub>x</sub> emissions. The SCR process combines vaporized ammonia with NO<sub>x</sub> in the presence of a catalyst to form nitrogen and water. The vaporized ammonia is injected into the exhaust gases prior to passage through the catalyst bed. The SCR process can achieve up to 90 percent reduction of NO<sub>x</sub> with a new catalyst. An aged catalyst will provide a maximum of approximately 86 percent NO<sub>x</sub> reduction.

Table 4-1 presents the capital and annual costs for an SCR system installed on the four combustion turbines. An SCR system designed for an overall NO<sub>x</sub> reduction rate of 86 percent would add approximately \$17 million (1989 dollars) to the capital cost and \$4.4 million to the annual cost of the four combustion turbines (assuming continuous full load operation firing distillate fuel).

The optimum flue gas temperature range for SCR operation is approximately 700 to 850 F. Flue gas from the combustion turbines will be approximately 1,000 F. Therefore, the gas must be cooled prior to injection of ammonia. The most economical method to reduce the flue gas temperature is through humidification of the flue gas with water. The water quality for humidification must be mostly free of sodium and salt deposits to protect the catalyst. The existing onsite water treatment system will be operated at rated capacity to supply the water needed for turbine water injection. Therefore, a new water treatment facility would



TABLE 4-1. SELECTIVE CATALYTIC REDUCTION CAPITAL AND ANNUAL COSTS

	<u>Capital Cost x \$1,000</u>
Reactor System	6,400
Ammonia Storage and Injection	1,600
Flue Gas Supply and Exhaust	700
Water Treatment and Injection	2,800
Differential Balance of Plant	<u>300</u>
1988 Capital Cost	11,800
Contingency (10%)	<u>1,180</u>
Total Direct Capital Cost	12,980
Escalation (5%)	<u>650</u>
Direct Capital Cost	13,630
Indirects (15%)	2,040
Interest During Construction (10%)	<u>1,570</u>
Total Capital Cost	17,240
	 <u>Annual Cost* x \$1,000</u>
Operation and Maintenance	1,500
Additive	310
Energy	620
Fixed Charges on Capital (13.7%)	<u>2,000</u>
Total Levelized Annual Cost	4,430

\*Annual costs are based on a 100 percent capacity factor.

be required to demineralize water prior to injection upstream of the SCR catalyst.

Capital costs for the selective catalytic reduction system include catalytic reactors, ammonia additive injection system, balance of plant costs, water treatment facilities, and incremental fan costs. Annual costs include fixed charges on capital investment, operating personnel, maintenance, ammonia additive, spent catalyst replacement, and steam and electric energy.

A levelized annual cost of \$4.4 million results in an incremental removal cost of approximately \$2,500 per additional ton of NO<sub>x</sub> reduction (1,800 tons per year). This is based on continuous full load operation of the combustion turbines (a capacity factor of 100 percent). Basing the economics on a 100 percent capacity factor gives the lowest potential incremental cost for this control alternative. A more realistic operating assumption would be that the combustion turbine would operate with less than a 20 percent capacity factor. Assuming a capacity factor of 20 percent, incremental removal costs would increase to approximately \$6,900 per additional ton of NO<sub>x</sub> reduced (360 tons per year).

The energy requirements of the SCR system would reduce the output of the combustion turbines by approximately one percent.

The use of an SCR system would result in a negative environmental impact of releasing significant quantities of unreacted ammonia to the atmosphere. This is due to SCR system NO<sub>x</sub> reduction reaction inefficiencies resulting in incomplete use of the ammonia additive. In addition, catalytic elements are toxic. Because they have to be replaced periodically, hazardous waste disposal procedures must be followed.

SCR is the only effective post combustion NO<sub>x</sub> reduction control alternative available. The temperatures at the outlet of a simple cycle combustion turbine are too low (1,000 F) for selective non-catalytic reduction systems (Thermal DeNO<sub>x</sub>). A Thermal DeNO<sub>x</sub> system requires gas temperatures of at least 1,500 F for NO<sub>x</sub> reduction. Since this would require supplemental heating of the flue gas, thereby, increasing total emissions from the plant due to increased fuel usage this alternative is judged technically unacceptable for application on a combustion turbine.

#### 4.2.2 Nitrogen Oxide Emission Combustion Controls

Use of water or steam injection in the combustion zones of a Frame 6 combustion turbine can limit the amount of NO<sub>x</sub> formed. Thermal NO<sub>x</sub> formation is avoided due to lower combustion temperatures resulting from the water or steam injection. The degree of reduction in NO<sub>x</sub> formation is somewhat proportional to the amount of water injected into the turbine.

New source performance standards for combustion turbines imposes a 75 ppmvd (plus heat rate adjustment) emission limit at 15 percent oxygen for nitrogen oxide (NO<sub>x</sub>). Compliance with the 75 ppmvd NO<sub>x</sub> emission limit requires either water or steam injection.

Since the combustion turbine NSPS was last revised in 1982, combustion turbines have improved their tolerance to the water necessary to control NO<sub>x</sub> emissions below the new source level. However, there is still a point where the amount of water injected into the turbine seriously degrades its reliability and operational life. This generally occurs at NO<sub>x</sub> emission levels of about 65 ppmvd (with no heat rate adjustment) on oil and 42 ppmvd on natural gas. These NO<sub>x</sub> emission levels can be achieved with little additional cost and with little impact on reliability or power output over those costs required to comply with the NSPS.

Use of the 65/42 ppmvd NO<sub>x</sub> emission level is supported by the EPA BACT/LAER Clearinghouse documents since no combustion turbine projects outside of California are limited to NO<sub>x</sub> emission levels below these levels.

The consideration of environmental factors also supports the selection of water/steam injection combustion controls as BACT for NO<sub>x</sub>. Areas surrounding the proposed location of the combustion turbines are all classified as attainment areas for NO<sub>x</sub>. In addition, modeling analysis at the proposed NO<sub>x</sub> emission rates of 65/42 ppmvd resulted in ambient impacts below significant impacts criteria. Therefore, the lower NO<sub>x</sub> emissions from use of SCR technology will not result in any quantifiable improvement in environmental impacts.

Use of an SCR system will result in the emission of various amine compounds formed by the unreacted ammonia exiting the SCR system. This represents a potential adverse human health effect since many amine

compounds are suspected or known carcinogens. Although, ammonia emissions are not regulated nationally, at least one district in California recently set a limit of 10 ppm. Unreacted ammonia emissions from an SCR system should average 7 to 10 ppm, and could create objectionable odor and health hazards.

All of the previously mentioned considerations indicate that there are no potential cost benefits to use of an SCR system for the Indian River Plant. Therefore, based on economic, energy and environmental considerations, NO<sub>x</sub> BACT for this simple cycle combustion turbine facility is the use of water or steam injection to achieve NO<sub>x</sub> emissions of 65 ppmvd or 42 ppmvd at 15 percent oxygen when burning distillate fuel or natural gas, respectively.

#### 4.2.3 Carbon Monoxide and Volatile Organic Compound Emission

The BACT/LAER Clearinghouse documents do not list any combustion turbine projects with more stringent emission requirements than 10 ppmvd and 5 ppmvd for CO and VOC emissions, respectively. As previously discussed, CO and VOC emissions from combustion turbines are minimized by ensuring as complete combustion as possible. Water injection for the control of NO<sub>x</sub> emissions tends to raise CO and VOC emission levels. However, due to advances in combustion turbine design made in the last few years, the increase is not significant at the levels of water injection necessary to achieve NO<sub>x</sub> emissions at the proposed BACT level. Therefore, the use of combustion turbines designed to meet CO and VOC emission rates of 10 ppmvd and 5 ppmvd at 15 percent oxygen, respectively is proposed as BACT.

Clearinghouse documents do list combustion turbine facilities that use a catalytic reduction system to reduce CO and VOC emissions. The process is a straight catalytic reaction requiring no additives. Permits requiring the use of these catalytic reactors have CO and VOC emission limits greater than or equal to the proposed limits. It is difficult to evaluate any improvements that might be made through use of this technology. Equipment manufacturers expect that emissions may be reduced, but that this improvement may not be quantifiable due to the measurement accuracy of

continuous emissions monitors and stack testing methods. The potential advantages of this system does not outweigh uncertainties regarding its effectiveness.

#### 4.3 SULFUR DIOXIDE AND OTHER CRITERIA AND NON-CRITERIA POLLUTANT EMISSIONS

Review of BACT/LAER Clearinghouse documents did not list any distillate or gas fired combustion turbines that were required to use flue gas desulfurization (FGD) systems to meet sulfur dioxide (SO<sub>2</sub>) emission requirements. Most of the permits for distillate fuel fired combustion turbines have limits for maximum allowable fuel sulfur contents.

##### 4.3.1 Flue Gas Desulfurization

To comply with the requirements for a "top-down" BACT analysis, a wet limestone scrubber FGD system will be considered for use downstream of the combustion turbines. Wet limestone scrubbers have been successfully used to meet SO<sub>2</sub> emission requirements for a great number of coal fired boilers. It is widely recognized as the most stringent SO<sub>2</sub> control technology available.

Wet limestone scrubber modules serve as a contact zone where the slurried alkaline limestone additive contacts and absorbs the SO<sub>2</sub> from the flue gas. The gaseous SO<sub>2</sub> combines with calcium in the slurried limestone to form a wet calcium sulfate/sulfite reaction product. Reaction products are subsequently dewatered and disposed of in a pond, or solid waste disposal landfill.

A wet limestone system designed for 70 percent SO<sub>2</sub> removal would add a total of approximately \$40 million (1989 dollars) to the capital cost and \$12 million to the annual cost of the four combustion turbines (assuming continuous full load operation on distillate fuel). Capital costs include costs for additive preparation, flue gas desulfurization (scrubber modules, reaction tanks, pumps, piping, etc.), flue gas supply and exhaust, waste separation and storage, and waste disposal systems for a complete FGD system. Annual costs include fixed charges on capital investment, operating personnel, additive, maintenance, and energy and demand costs.

TABLE 4-2. WET LIMESTONE SCRUBBER FGD SYSTEM CAPITAL AND ANNUAL COSTS

	<u>Capital Costs x \$1,000</u>
Additive Preparation	2,000
FGD System	20,000
Flue Gas Supply and Exhaust	2,500
Waste Separation and Storage	1,700
Waste Disposal	<u>800</u>
1988 Capital Cost	27,000
Contingency (10%)	<u>2,700</u>
Total Direct Capital Cost	29,700
Escalation (5%)	<u>1,500</u>
Direct Capital Cost	31,200
Indirects (15%)	4,700
Interest During Construction (10%)	<u>3,600</u>
Total Capital Cost	39,500
	 <u>Annual Costs* x \$1,000</u>
Operating Personnel	400
Maintenance	2,400
Additive	50
Energy	2,800
Waste Disposal	770
Fixed Charges on Capital	<u>5,400</u>
Total Levelized Annual Cost	11,820

\*Annual costs are based on combustion of fuel oil only and a 100 percent capacity factor.

A detailed listing of capital and annual operating costs are presented on Table 4-2.

A levelized annual cost of \$12 million results in an incremental removal cost of approximately \$7,000 per additional ton of SO<sub>2</sub> removed (1,700 tons per year). Basing the economics on burning distillate oil at a 100 percent capacity factor gives the lowest potential incremental cost for this control alternative. Since it is anticipated that natural gas will be the primary fuel, a more realistic operating assumption would be that the units would operate with less than a 10 percent capacity factor on distillate fuel. Assuming a capacity factor of 10 percent incremental removal costs would increase to approximately \$36,000 per additional ton of SO<sub>2</sub> removed (170 tons per year).

The energy requirements of the FGD system would reduce the output of the combustion turbines by four percent. Solid wastes formed as part of the desulfurization process would also require disposal.

An additional benefit of an FGD system is the removal of hazardous air pollutants from the flue gas stream. Removal occurs either due to absorption by the scrubbing liquor, or condensation of the substance from the flue gas. Table 4-3 lists estimated controlled and uncontrolled emissions of other criteria and non-criteria pollutants identified as potential hazardous air pollutants from combustion turbines in the EPA publication entitled Compiling Air Toxics Emission Inventories (EPA-450/4-86-010). Uncontrolled emission estimates for the criteria pollutants indicate that significance levels are exceeded for beryllium and sulfuric acid mist. Significance levels do not represent emission limitations, but rather are indicators of whether a BACT review is necessary during the permit process.

Uncontrolled emission estimates are developed based on manufacturer information and on information contained in both the EPA document and a publication entitled Trace Elements in Petroleum, by Vlado Valkovic (PPE Books, 1978). FGD removal rates are based on a variety of wet limestone scrubber characterization tests for trace element removal. Emissions are total for four combustion turbines based on a 100 percent capacity factor burning distillate fuel oil. Estimated emissions listed on the table

TABLE 4-3. TRACE ELEMENTS AND OTHER NON-CRITERIA POLLUTANT EMISSIONS

Pollutant	Uncontrolled		FGD System Removal percent	Controlled	
	Emission Rate lb/MBtu	Annual Emission* tpy		Emission Rate lb/MBtu	Annual Rate tpy
Antimony	5.1 E-7	3.9 E-3	99	5.1 E-9	3.9 E-5
Arsenic	2.9 E-6	0.022	93	2.0 E-7	1.5 E-3
Barium	2.5 E-8	1.9 E-4	99	2.5 E-10	1.9 E-6
Beryllium**	2.3 E-7	1.8 E-3	99	2.3 E-9	1.8 E-5
Cadmium	1.7 E-4	1.3	94	1.0 E-5	0.076
Chlorine	7.5 E-5	0.57	89	8.3 E-6	0.063
Chromium	1.2 E-4	0.92	91	1.1 E-5	0.084
Cobalt	1.5 E-5	0.11	98	3.0 E-7	2.3 E-3
Copper	1.5 E-5	0.11	99	1.5 E-7	1.1 E-3
Fluoride**	5.6 E-5	0.44	99	5.6 E-7	4.3 E-3
Formaldehyde	1.9 E-4	1.5	90	1.9 E-5	0.15
Lead**	9.5 E-6	0.07	98	1.9 E-7	1.5 E-3
Manganese	1.4 E-6	0.010	98	2.8 E-8	2.1 E-4
Mercury**	1.1 E-5	0.084	23	8.5 E-6	0.065
Nickel	1.1 E-5	0.084	93	7.7 E-7	5.9 E-3
Sulfuric Acid Mist**	0.023	176	50	0.012	88
Vanadium	8.4 E-3	64	98	1.7 E-4	1.3

\*Annual emissions are total for four combustion turbines, and are based on 100 percent capacity factor burning distillate fuel oil.

\*\*The following are the PSD significance levels for the remaining criteria pollutants.

-- Beryllium	0.0004 tpy
-- Fluoride	3 tpy
-- Lead	0.6 tpy
-- Mercury	0.1 tpy
-- Sulfuric acid mist	7 tpy



indicate that an an FGD system would remove significant quantities of beryllium, sulfuric acid mist, and vanadium. However, as indicated by the previously mentioned costs for an FGD system, removal of these elements and compounds are considerable.

#### 4.3.2 Distillate Fuel Sulfur Content Control

The sulfur content of the distillate fuel can also be limited to minimize SO<sub>2</sub> emissions. New Source Performance Standards for combustion turbines require that SO<sub>2</sub> emissions be limited to below 0.8 lb/MBtu. OUC can obtain a distillate fuel that would meet an SO<sub>2</sub> emission limit of 0.30 lb/MBtu (approximately 0.30 percent sulfur distillate fuel) with little additional cost over the oil used to comply with the NSPS limitation of 0.8 lb/MBtu. Therefore, the emission of SO<sub>2</sub> from the combustion turbines can be controlled by limiting the distillate fuel sulfur content to 0.30 percent by weight. The resulting SO<sub>2</sub> emission is 60 percent more stringent than the requirements of the NSPS for combustion turbines.

The consideration of environmental factors also supports selection of fuel sulfur content control as BACT for SO<sub>2</sub> emissions. Areas surrounding the proposed location of the combustion turbines are all classified as attainment areas for SO<sub>2</sub>. In addition, modeling analysis at the proposed SO<sub>2</sub> emission rate of 0.30 lb/MBtu resulted in ambient impacts below significant impacts criteria. The lower SO<sub>2</sub> emissions from the use of an FGD system will not result in any quantifiable improvement in environmental impacts. An FGD system would have the additional negative environmental impact of solid waste disposal, and groundwater consumption.

Therefore, based on economic, energy, and environmental considerations limitation of the fuel sulfur content to 0.30 percent by weight, and an emission limit of 0.30 lb/MBtu is proposed as BACT for the OUC Indian River Combustion Turbine Project.

#### 4.3 PARTICULATE EMISSIONS

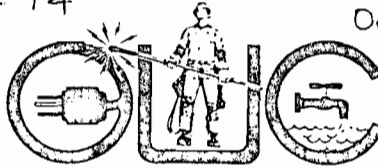
The emission of particulates from the combustion turbine facility will be controlled by ensuring as complete combustion of the fuel as possible. The NSPS for combustion turbines do not establish an emission limit for

particulate. A review of the EPA's BACT/LAER Clearinghouse documents did not reveal any post combustion particulate control technologies being used on gas/oil fueled combustion turbines. The natural gas and distillate oil fuels to be used in the proposed combustion turbines will only contain trace quantities of particulate. Therefore, OUC's standard operating procedures will ensure as complete combustion of the fuel as possible and is the proposed BACT for total suspended particulate, and particulate matter smaller than 10 microns (PM<sub>10</sub>).

CM P 744 170 274

15 April 1988  
Orlando, FL

Tam  
Wing



ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 305/423-9100

CERTIFIED RETURN RECEIPT REQUESTED

RECEIVED

April 11, 1988

APR 18 1988

DER-BAQM

Mr. C. H. Fancy, Deputy Chief  
Bureau of Air Quality Management  
Florida Department of  
Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

RE: Combustion Turbine Facility  
Permit No. AC05-144482, PSD-FL-130

Dear Mr. Fancy:

In response to your letter dated March 10, 1988, I would like to submit the requested information for points 1 through 5 as follows:

1. We submitted an additional \$3000 on March 16, 1988 plus the initial \$1000 for a total of \$4000 for the permit.
2. Black and Veatch has revised table 3-1 and submitted this information to the Department. I have attached a corrected copy to this correspondence.
3. Both start and black start capability for the combustion turbines will be provided by an 800 HP internal combustion diesel on each unit. This engine typically runs for 4½ minutes during a start and consumes 2.19 gallons of No. 2 fuel oil. This is followed by a five minute cool down idle that consumes 0.1 gallons for a total of 2.29 gallons. Emissions would be expected to be less than 0.1 lbs SO<sub>2</sub> per unit per start. We anticipate that each unit would make approximately 130 starts per year.

The 1 MW diesel generator from the Lake Highland Plant was evaluated to see if it had black start capability for the combustion turbines and was therefore mentioned in the application. However, it has been determined not capable and will not be technically associated with the combustion turbine project.

Mr. Fancy  
April 11, 1988  
Page Two

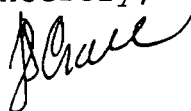
4. We do not anticipate any other sources of air pollution associated with this project other than those previously mentioned.
5. The water-fuel ratio required to achieve the specified NO<sub>x</sub> emission limits will be determined during the initial testing and startup of the combustion turbines. For design purposes, Black & Veatch is using a water-fuel ratio (at base rating) as follows:

- Natural gas                    31.6 GPM water/7230 CFM gas
- No. 2 fuel oil                26.8 GPM water/51 GPM oil

Black & Veatch, our consultant, is in the process of evaluating BACT using the top down approach. I expect their analysis to be ready within the next two weeks.

If you have any questions, please call me at (305)423-9141 or Steve Day (Black & Veatch) at (913)339-2880.

Sincerely,



J. S. Crall  
Director  
Environmental Division

JSC:ch  
Attachment

xc: W. H. Herrington  
F. F. Haddad  
T. D. Slepow  
S. M. Day (B&V)

Pradeep Raval  
Tom Rogus  
Barry Andrews  
CHF/ST  
Tom Sawicki (CF Diot)

} 4.19.88 (M)

TABLE 3-1. SUMMARY OF AIR EMISSIONS FROM GENERAL ELECTRIC  
FRAME 6 COMBUSTION TURBINES

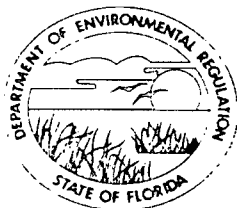
<u>Pollutant</u>	<u>Fuel</u>	<u>Maximum Emissions Per Unit lb/h</u>	<u>Potential Annual Emissions*</u>		<u>Significant Emission Rate t/yr</u>	
			<u>1 Unit t/yr</u>	<u>4 Units t/yr</u>		
Carbon Monoxide	Gas	10.0	43.8	175	100	
	Oil	10.1	44.2	177	100	
Nitrogen Oxides (as NO <sub>2</sub> )	Gas	75.1	329	1,320	40	Revised 021088
	Oil	118.3	518	2,070	40	
Sulfur Dioxide	Gas	25.4	111	445	40	
	Oil	142.7	625	2,500	40	
Total Particulate	Gas	2.5	11	44	25	
	Oil	10.0	43.8	175	25	
PM <sub>10</sub>	Gas	2.5	11	44	15	Revised 021088
	Oil	10.0	43.8	175	15	
VOC	Gas	4.0	18	70	40	
	Oil	4.0	18	70	40	

\*Based on 8,760 hours of full load operation per year.

NOTE: The emissions are for operation at sea level and 59 F.

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING  
2600 BLAIR STONE ROAD  
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ  
GOVERNOR  
DALE TWACHTMANN  
SECRETARY

March 18, 1988

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. William H. Herrington  
Orlando Utilities Commission  
500 South Orange Avenue  
Orlando, Florida 32802

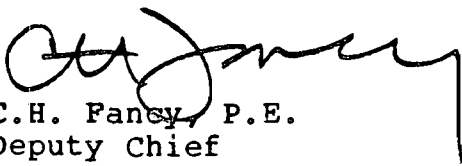
Dear Mr. Herrington:

Re: Combustion Turbine Facility,  
Permit No. AC 05-144482, PSD-FL-130.

Please respond to the comments from U.S. EPA on the above referenced project (letter attached), at the time you respond to DER's letter requesting additional information dated March 10, 1988.

If you have any questions please call Barry Andrews (BACT), Pradeep Raval (permitting), or Max Linn (modeling) at (904) 488-1344 or write to me at the above address.

Sincerely,

  
C.H. Fancy, P.E.  
Deputy Chief  
Bureau of Air Quality  
Management

CF/PR/ss

cc: T. Sawicki, CF Dist.  
M. Flores, NPS  
J. Crall, OUC  
S. Day, Black & Veatch



## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET  
ATLANTA, GEORGIA 30365MAY 14 1988  
4APT/APB

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MAR 17 1988

DER-BAQM

Margaret V. Janes, Planner  
Bureau of Air Quality Management  
Florida Department of Environmental Regulation  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32299-2400

Re: Orlando Utilities Commission (PSD-FL-130)

Dear Ms. Janes:

This is to acknowledge receipt of the copy of the permit application submitted by the Orlando Utilities Commission. After reviewing the document, we have some questions concerning the BACT analyses. Our comments are as follows:

1. Overall, the BACT analyses lack the necessary documentation to substantiate the company's statements. Specifically, the analyses lack emission calculations and a copy of the units' original specifications. This data is needed to substantiate the proposed emission rates. Please request the applicant to provide you with this information. The applicant should also provide a detailed cost analysis comparing different control strategies for each applicable pollutant. Then, the applicant should take into consideration the various environmental and economic impacts before making the final BACT decision. As a minor note, on page 3-2, the "potential annual emissions" reflect only half of the "maximum emissions per unit." Please ask the applicant to correct this error.
2. With regard to the NO<sub>x</sub> BACT determination, please ask the applicant to provide a detailed cost analysis for the mentioned control methods (i.e., water injection, selective catalytic reduction, etc.). However, the proposed NO<sub>x</sub> concentration limits for both gas and oil fuel do appear to be reasonable.
3. With regard to the SO<sub>2</sub> BACT determination, the applicant should quantify the addressed potential hazardous air pollutants (HAPs) (i.e., vanadium, acid gases, etc.) which could be emitted during the combustion of distillate oil. Since the applicant does not make clear the amount of oil that is to be used, one may assume that the applicant could, in theory, burn oil for the whole year. If this were the case, the amount of HAPs emitted could be significant and the applicant should address those emissions when determining the proper BACT for SO<sub>2</sub>. As mentioned in comment one, a detailed cost analysis should be provided addressing the various control strategies (i.e., wet sodium scrubber, venturi scrubber, and so

forth). Finally, any significant HAPs should be taken into consideration when making the final BACT decision.

- 4. In accordance with the December 1, 1987, Potter memorandum, we suggest that the applicant perform the mentioned BACT determinations in a "top-down" manner.

Thank you for the opportunity to provide you with our comments. Please ask the applicant to address the above issues before making your preliminary determination. If you have any additional information or comments, please feel free to contact me or Gary Ng of my staff at (404) 347-2864.

Sincerely yours,

*Bruce P. Miller*

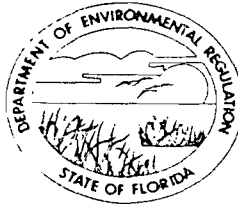
Bruce P. Miller, Chief  
Air Programs Branch  
Air, Pesticides, and Toxics  
Management Division

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 CHPTBT } 3-17-88



STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

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TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ  
GOVERNOR  
DALE TWACHTMANN  
SECRETARY

March 10, 1988

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. William H. Herrington  
Orlando Utilities Commission  
500 South Orange Avenue  
Orlando, Florida 32802

Dear Mr. Herrington:

Re: Completeness Review, Combustion Turbine Facility,  
Permit No. AC 05-144482, PSD-FL-130.

The Department has received and reviewed your application packages dated January 18 and February 10, 1988. The application is deemed incomplete. Please submit the following information needed to resume the review:

1. Please submit the appropriate application fee (Re: DER letter dated February 15, 1988).
2. Please revise Table 3-1, if necessary, to reflect the number of turbines you wish permitted taking into consideration the environmental and operating conditions which would result in the maximum emissions.
3. Describe the black start capability of the turbines. What will be its associated air emissions? Will the black start capability be provided by the 1 MW diesel generator that is to be relocated from the Lake Highland Plant? What will be the air emissions and fuel consumption of this generator (for inventory purposes only)?
4. Will any other sources of air pollutants be involved in the proposed project other than the ones discussed above? What will be their emissions?
5. At what water-fuel or steam-fuel ratio do you intend to set the NOx control system?

Mr. William H. Herrington  
Page 2  
March 10, 1988

6. In accordance with recent EPA policy developments regarding Best Available Control Technology (BACT) determinations and non-regulated pollutants, the following areas need to be addressed:
  - a. Top down BACT: BACT is now being evaluated from a top down approach. In using this approach, BACT is initiated using LAER as a starting point. BACT is then determined based on the economic, environmental, and energy impacts of each control alternative beginning with the emission level/control technology associated with LAER. If the control/emission rate associated with LAER is not justified by these constraints, a lesser degree of control is selected and the analysis is repeated until the level of control that is justified is reached.

In accordance with this top down concept, the economics and corresponding emission reduction achieved by using selective catalytic reduction must be addressed. The same type of analysis should also be provided for water/steam injection at levels higher than those which were originally proposed in the application.

All toxic air pollutants that may be emitted by these turbines need to be addressed with respect to the proposed control technology. For gas/oil fired turbines, the toxic air pollutants are identified in the publications entitled, "Compiling Air Toxics Emission Inventories", EPA-450/4-86-010 and "Control Technologies for Hazardous Air Pollutants", EPA/625/6-86-014. In accordance with these publications, the pollutants dioxin, formaldehyde, and polycyclic organic matter (POM) need to be addressed.

If you have any questions please call Barry Andrews (BACT), Pradeep Raval (permitting), or Max Linn (modeling) at (904) 488-1344 or write to me at the above address.

Sincerely,

*William H. Fancy*  
for  
C. H. Fancy, P.E.  
Deputy Chief  
Bureau of Air Quality  
Management

CF/PR/ss

cc: T. Sawicki, DER  
W. Aronson, EPA  
M. Flores, NPS  
J. Crall, OUC  
S. Day, Black & Veatch



PM  
8 March 1988  
Orlando, FL

*file copy*

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CERTIFIED RETURN RECEIPT REQUESTED

March 7, 1988

Mr. Pradeep Raval  
Bureau of Air Quality Management  
Florida Department of  
Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

RECEIVED

MAR 11 1988

DER - BAQM

Dear Mr. Raval:

Per our telephone discussion and your letter of February 15, 1988, please find enclosed a check for \$3000 which represents the balance of our application fee in order to permit all four proposed combustion turbine units at our Indian River Plant.

I understand that with this additional fee we will receive a permit that covers the construction of all four units and further additional air permitting for this project will not be necessary if the required schedule for phased construction is met.

Unit #2 = AC 05 - 146749  
Unit #3 = AC 05 - 146750  
Unit #4 = AC 05 - 146751

Cordially,

J. S. Crall  
Director  
Environmental Division

JSC:ch  
Enclosure

xc: W. H. Herrington

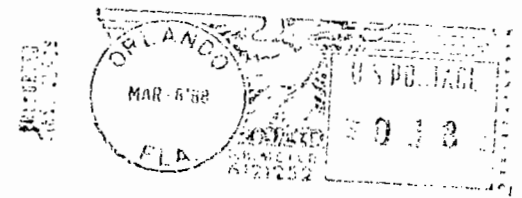
Copied: Pradeep Raval }  
Tom Rogers } 3-16-88  
Barry Andrews }  
T. Sawicki }

1031



ORLANDO UTILITIES  
COMMISSION

P. O. BOX 3193  
ORLANDO, FLORIDA 32802



Mr. Pradeep Raval  
Bureau of Air Quality Management  
Florida Department of  
Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400



# Orlando Utilities Commission

ORLANDO, FLORIDA

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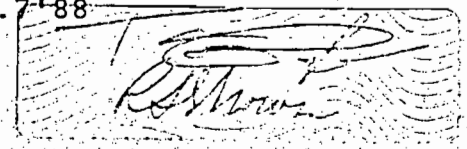
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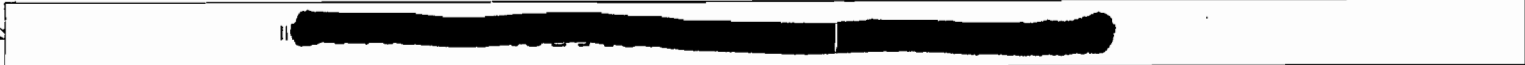
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MAR. 7 '88



AUTHORIZED SIGNATURE

SUN BANK, N.A.  
MAIN OFFICE:  
ORLANDO, FLORIDA 32801



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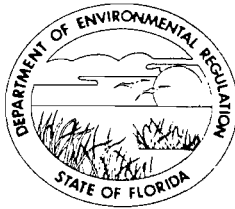
No. 014108

INVOICE DATE	VENDOR INVOICE NUMBER	VOUCHER NUMBER	AMOUNT
			3,000.00
Balance of application fee to construct all four combustion turbine units at Indian River Plant submitted Jan. 8, 1988.			
DISB #	VENDOR NO.	CHECK DATE	TOTAL

*Extra*

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING  
2600 BLAIR STONE ROAD  
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ  
GOVERNOR  
DALE TWACHTMANN  
SECRETARY

February 15, 1988

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. William H. Herrington  
Orlando Utilities Commission  
500 South Orange Avenue  
Orlando, Florida 32802

Dear Mr. Herrington:

Re: Permit Processing Fee Requirements  
Permit No. AC 05-144482, PSD-FL-130

In reference to my conversation with Mr. Jim Crall on February 12, 1988, the appropriate application fee for each turbine is \$1000.00, since the potential emissions from each turbine (source) is greater than 100 tons per year for a single pollutant.

If you wish to apply for permits for ~~only~~ two units at this time, you will need to send an additional \$1000.00 (since we have \$1000.00 submitted by you on January 20, 1988).

Enclosed is information which will help you evaluate the fee schedule in accordance with the Florida Administrative Code. If you have any questions please call me at (904)488-1344 or write to me at the above address.

Sincerely,

*Pradeep Raval*  
Pradeep Raval  
Engineer  
Bureau of Air Quality  
Management

PR/ks

enclosure

cc: J. Crall, OUC  
T. Sawicki, DER

The above listed exemptions do not relieve the named installation, facility or equipment from any other requirements of the Florida Pollution Control Act or rules and regulations of the Department.

Specific Authority: 403.061, 403.805, F.S. Law Implemented: 253.123, 253.124, 403.021, 403.031, 403.061, 403.087, 403.088, 403.802, 403.805, 403.813, F.S. History: Formerly 17-4.03(2), F.A.C.; New 3-4-72; Revised 5-17-72; Amended 8-7-73, 6-10-75, 10-26-75, 7-8-76, 7-13-78, 3-1-79; Joint Administrative Procedures Committee Objection Withdrawn - See FAW Vol. 3, No. 30, 7-29-77; Amended 3-11-81, 7-8-82, 3-31-83, 3-15-84, 12-10-84.

#### 17-4.05 Procedure to Obtain Permit; Application.

(1) Any person desiring to obtain a permit from the Department shall make application on forms prescribed by the Department and shall submit such information as the Department may require. The Department may require such person to submit any additional information reasonably necessary for proper evaluation.

(2) All applications and supporting documents shall be filed in quadruplicate with the Department.

(3) To ensure protection of public health, safety, and welfare any construction, modification, or operation of an installation which may be a source of pollution or a public drinking water supply shall be in accordance with good professional engineering practices pursuant to Chapter 471, Florida Statutes. Therefore, all applications for a Department permit shall be certified by a professional engineer

registered in the State of Florida except when the applicant is a salaried officer of the government of the United States or a salaried engineer employed by such government while engaged within the State in the practice of professional engineering solely for the United States government or where professional engineering is not required by Chapter 471, F.S.

(4) Each application for a permit shall be accompanied by a processing fee, except for applications filed by departments of the executive branch established pursuant to Chapter 20, F.S., and water management districts established pursuant to Chapter 373, F.S. The check shall be made payable to the Department of Environmental Regulation. The processing fee is non-refundable except as provided for in Section 120.60, F.S., and in this section. Processing fees are as follows:

(a) Air Pollution Source Permits

1. Construction Permit for a source having potential emissions of more than 100 tons per year of any single pollutant \$1000
2. Construction Permit for a source having potential emissions of more than 75 tons per year of any single pollutant \$750
3. Construction Permit for a source having potential emissions of more than 50 tons per year of any single pollutant \$500
4. Construction Permit for a source having potential emissions of more than 25 tons per year of any single pollutant \$250
5. Construction Permit for a source having potential emissions of less than 25 tons per year of any single pollutant \$100

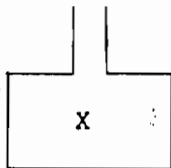
INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee		
To: _____	Loctn.: _____	
To: _____	Loctn.: _____	
To: _____	Loctn.: _____	
From: _____	Date: _____	
Reply Optional [ ]	Reply Required [ ]	Info. Only [ ]
Date Due: _____	Date Due: _____	

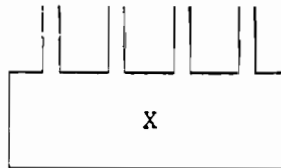
TO: District/Subdistrict Managers  
THRU: Bill Buzick  
FROM: Clair Fancy *CAF*  
DATE: July 16, 1982  
SUBJ: Permit Fees

The following is CAPS interpretation of the term "source" as it will relate to charging permit fees. This is based on past practices, and I feel is the most logical way to interpret the term. We are looking for consistency in assessing fees among the Districts and CAPS, and hopefully this will help bring this goal about. This will be one of the topics for discussion at the August District Air Engineers Meeting. If you have any questions or comments prior to that time, please feel free to call me.

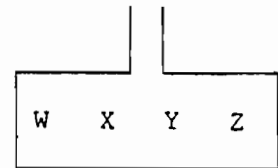
One source for fee purposes:



any single process  
(e.g., boiler, incinerator, degreaser)

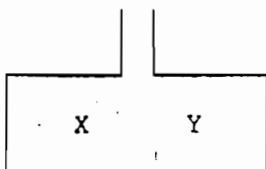


any single process  
(e.g., drying oven, conveyor system)

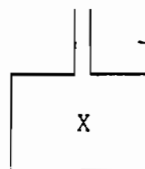


small, similar or dissimilar operations (e.g., plating, degreasing, paint dipping, sanding, painting, grinding)

Two sources for fee purposes:



2 large processes with one stack  
(e.g., 2 boilers; boiler, kiln)



2 processes, similar or dissimilar, each with one stack (e.g., degreasers, cement silos, boilers, spray booths)

CF/pa

cc: Steve Smallwood  
Marti Hall  
Marshall Mott-Smith  
Bill Thomas  
Larry George



dissolvers, viscosity reducers, or cleaning agents.

(175) "Solvent Metal Cleaning" - The process of cleaning soil from metal surfaces by cold cleaning or open top vapor degreasing or conveyORIZED degreasing.

(176) "Source" or "Stationary Source" - An identifiable piece of equipment (or the smallest integral combination of pieces of equipment, structures, and necessary appurtenances) that is used as a complete unit to accomplish a specific purpose or to produce a specific product; and which:

(a) Includes at least one activity or operation which is the point of origin of an air pollutant, in that it separates or allows the separation of a pollutant from process or other materials or accomplishes the conversion of all or part of various materials or fuels into a pollutant;

(b) Has at least one emission or discharge point; and

(c) Exists at or is designed to be operated as a unit at a fixed location, although parts of the source may move while the source is in operation.

(177) "Stack" - A pipe, duct, chimney, or other functionally equivalent device that confines and conveys air pollutants from a source or group of sources into the atmosphere through an emission point designed to discharge air pollutants into the atmosphere.

(178) "Stagnant Atmospheric Condition" - The atmospheric and meteorological conditions which cause a reduction in the diffusion and dispersment of air pollutants in the atmosphere.

(179) "Standard Sulfur Pellets" - Any generally spherical form

of solid sulfur (such as air or water-formed prills, or granules, or hemispherical forms such as Sandvick rotoform, but not including agglomerates, popcorn, slate or crushed bulk sulfur) that meets all of the following specifications. All required tests shall be performed on sulfur pellets that have been allowed to stand a minimum of 20 days after being formed. All test results shall be the arithmetic average of three test runs, each on a separate representative composite sample of the shipment or lot being tested.

(a) Not more than 20 percent retained on a 1/4 inch U.S. (6.3 mm) screen, determined in accordance with SUDIC Test Method S2-77: Sieve Analysis of Sulfur Forms, as adopted in Rule 17-2.700, FAC.

(b) Less than six percent additional fines (minus 50 U.S. screen) generated under SUDIC's standard Stress Level II test (Method S5-77: Determination of Friability of Sulfur Forms - 28 inch (700 mm) Diameter Tumbler Test).

(180) "State Implementation Plan (SIP)" or "Implementation Plan" - The EPA approved plan which Section 110 of the Act requires a state to submit to the Administrator.

(181) "Standard Conditions" - A temperature of 68° Fahrenheit (20°C) and a pressure of 14.7 pounds per square inch absolute (760 mm Hg).

(182) "Startup" - The commencement of operation of any source which has shutdown or ceased operation for a period of time sufficient to cause temperature, pressure, chemical, or pollution control device imbalances, which result in excess emissions.

(183) "Straight Kraft Recovery Furnace" - A furnace used to recover

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING  
2600 BLAIR STONE ROAD  
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ  
GOVERNOR  
DALE TWACHTMANN  
SECRETARY

February 12, 1988

Mr. Miguel Flores, Chief  
Permit Review and Technical  
Support Branch  
National Park Service-Air  
Post Office Box 25287  
Denver, Colorado 80225

Dear Mr. Flores:

RE: Orlando Utilities Commission  
State Permit Number: AC 05-144482  
Federal Permit Number: PSD-FL-130

Enclosed for your review and comment is the permit application for the above referenced company. If you have any comments or questions, please contact Pradeep Raval or Max Linn at the above address or at (904)438-1344.

Sincerely,

*M. V. Janes*

Margaret V. Janes  
Planner  
Bureau of Air Quality  
Management

/mj

cc: Pradeep Raval  
Max Linn  
T. Sawicki, CF Dist.

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING  
2600 BLAIR STONE ROAD  
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ  
GOVERNOR  
DALE TWACHTMANN  
SECRETARY

February 12, 1988

Mr. Wayne Aronson, Chief  
Program Support Section  
U.S. EPA, Region IV  
345 Courtland Street, N.E.  
Atlanta, Georgia 30365

Dear Mr. Aronson:

RE: Orlando Utilities Commission  
State Permit Number: AC 05-144482  
Federal Permit Number: PSD-FL-130

Enclosed for your review and comment is the permit application for the above referenced company. If you have any comments or questions, please contact Pradeep Raval or Max Linn at the above address or at (904)488-1344.

Sincerely,

*M. V. Janes*

Margaret V. Janes  
Planner  
Bureau of Air Quality  
Management

/mj

cc: Pradeep Raval  
Max Linn  
T. Sawicki, CF Dist.

Mailed in Fed. Ex.  
envelop - no blue  
sheet no stamp PM

file copy

**BLACK & VEATCH**

ENGINEERS-ARCHITECTS

TEL. (913) 339-2000

**DER**

1500 MEADOW LAKE PARKWAY  
MAILING ADDRESS P.O. BOX NO. 8405  
KANSAS CITY, MISSOURI 64114

Orlando Utilities Commission  
Indian River Plant  
PSD Permit Application

FEB 11, 1988  
**BAQM**

B&V Project 14137  
B&V File 22.0400  
February 10, 1988

Mr. C. H. Fancy, Deputy Chief  
Bureau of Air Quality  
Florida Dept of Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

FEDERAL EXPRESS

Dear Mr. Fancy:

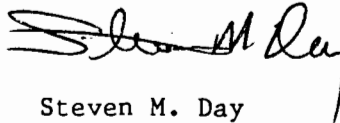
Enclosed are two additional copies of the OUC Indian River Plant Application to Construct which were submitted January 18, 1988. Also enclosed are six copies of revised Table 3-1, Summary of Air Emissions from General Electric Frame 6 Combustion Turbines. The emission rates in pounds per hour were all correct on the original table but most of the annual emissions were incorrectly calculated based on 4380 hours per year of operation rather than the desired 8760 hours per year. The enclosed revised Table 3-1 corrects this error. Please accept our apology for any confusion this may have caused. All other portions of the application are already based on the revised Table 3-1 and need no further correction.

An additional question has come up regarding the modeling attached to the report. The modeling was conducted based on an emission rate assuming an oil with an 0.8 percent sulfur content. The actual proposed oil will have a maximum sulfur content of 0.30 percent. Reported results for SO<sub>2</sub> impacts were obtained by multiplying the modeled impacts by the ratio of .3/.8 or 0.375 (not the rounded 0.38 stated on pages 5-2 and A-2).

If you have any questions regarding this application, please call me at 913-339-2880 or Jim Crall of OUC at 305-423-9141.

Very truly yours,

BLACK & VEATCH



Steven M. Day

SMD:lar  
Enclosure

cc: W. H. Herrington  
T. D. Slepov  
J. S. Crall, w/2 copies of application and revised Table 3-1

Copied: Pradeep Raval ✓  
Wayne Aronson, EPA ✓  
Barry Andrews ✓  
Max Linn ✓  
File ✓  
Miguel Flores, NPS ✓



Rev

FROM  
**BLACK & VEATCH**  
ENGINEERS-ARCHITECTS

P.O. BOX 8405

KANSAS CITY, MO. 64114

---

Mr. C. H. Fancy, Deputy Chief  
Bureau of Air Quality  
Florida Dept of Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

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 NO PM stamp

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TABLE 3-1. SUMMARY OF AIR EMISSIONS FROM GENERAL ELECTRIC  
 FRAME 6 COMBUSTION TURBINES

<u>Pollutant</u>	<u>Fuel</u>	<u>Maximum Emissions Per Unit lb/h</u>	<u>Potential Annual Emissions*</u>		<u>Significant Emission Rate t/yr</u>	
			<u>1 Unit t/yr</u>	<u>4 Units t/yr</u>		
Carbon Monoxide	Gas	10.0	43.8	175	100	
	Oil	10.1	44.2	177	100	
Nitrogen Oxides (as NO <sub>2</sub> )	Gas	75.1	329	1,320	40	Revised 021088
	Oil	118.3	518	2,070	40	
Sulfur Dioxide	Gas	25.4	111	445	40	
	Oil	142.7	625	2,500	40	
Total Particulate	Gas	2.5	11	44	25	
	Oil	10.0	43.8	175	25	
PM <sub>10</sub>	Gas	2.5	11	44	15	Revised 021088
	Oil	10.0	43.8	175	15	
VOC	Gas	4.0	18	70	40	
	Oil	4.0	18	70	40	

DER

FEB 11, 1988 *mr*

BAQM

\*Based on 8,760 hours of full load operation per year.

NOTE: The emissions are for operation at sea level and 59 F.

19 Jan 1988

Orlando, FL



**ORLANDO UTILITIES COMMISSION**

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 305/423-9100  
Cert. Return Receipt Requested

January 18, 1988

Mr. C. H. Fancy, Deputy Chief  
Bureau of Air Quality  
Florida Department of  
Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

**DER**

JAN 20, 1988 *(initials)*

**BAQM**

Dear Mr. Fancy:

Enclosed is an original and a copy of our application for a permit to construct an air pollution source. The application is for a four unit combustion turbine addition to our Indian River Plant. The permit is requested for all four units with construction to commence right away for the first two units. The third and fourth units are currently scheduled to commence construction in November 1989 and November 1990.

Our permit plan for these units which you reviewed for us indicated that multi source modeling would be required for SO<sub>2</sub> since modeled impacts from the four units exceeded the significant impact level in the EPA guidelines. This assessment had been made assuming 0.8 percent sulfur fuel oil. OUC is willing to commit to a maximum of 0.3 percent sulfur fuel oil for these combustion turbines. At this level of emissions, no pollutants exceed the significant impact level and, hence, no multi source modeling is necessary. We trust that this will enable you to accelerate your review of our application as it greatly simplifies the modeling requirements.

The application fee of \$1,000.00 is also enclosed.

Very truly yours,

J. S. Crall  
Director  
Environmental Division

JSC:ch  
Enclosures

xc: W. H. Herrington  
T. D. Slepow  
S. M. Day

Copied: Rodney Royal } 1-26-88  
Max Rimm } *(initials)*

INVOICE DATE	VENDOR INVOICE NUMBER	VOUCHER NUMBER		AMOUNT
	Application Fee		117512	1000.00
<hr/>				
DISB #	VENDOR NO.	CHECK DATE	TOTAL	

### Orlando Utilities Commission

ORLANDO, FLORIDA

"Where Electricity Powers Progress"

63-215  
631

No. 013982

PAY TO THE  
ORDER OF:

ORLANDO UTILITIES \$1000 and 00cts

NOT VALID  
AFTER 180 DAYS

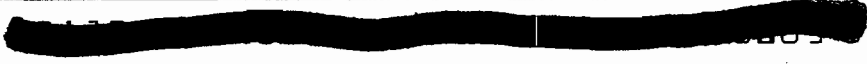
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2600 BLAIR STONE ROAD  
TALLAHASSEE, FLORIDA 32399-2400

1000.00

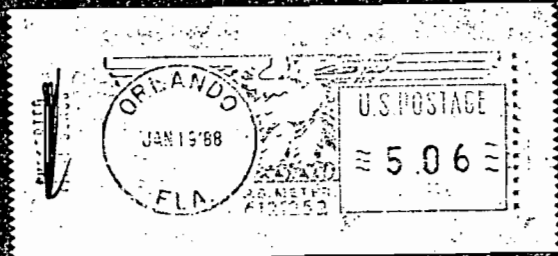
JAN 18 '88

SUN BANK, N.A.  
MAIN OFFICE  
ORLANDO, FLORIDA 32801

AUTHORIZED SIGNATURE







FROM

ORLANDO UTILITIES COMMISSION

P.O. BOX 3193

ORLANDO, FLORIDA 32802

Mr. C. H. Fancy, Deputy Chief  
Bureau of Air Quality  
Florida Department of  
Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

DER  
JAN 20  
BAQM

Fold at line over top of envelope to the right  
of the return address

CERTIFIED

P 744 170 322

MAIL

*Receipt Requested*

Receipt # 117512  
\$1000.00  
ACOS-144482  
Sub code = 01  
PSD-FL-130

Received ✓ for \$3,000.00  
on March 11, 1988 for  
Units 2-4

Unit #2 = ACOS-146749  
Unit #3 = ACOS-146750  
Unit #4 = ACOS-146751 } Received  
on 3-16-88 (my)

ORLANDO UTILITIES COMMISSION  
INDIAN RIVER PLANT--GAS TURBINE ADDITIONS  
FILE NO. 14137.22.0400

APPLICATION TO CONSTRUCT A MAJOR EMITTING  
FACILITY IN ACCORDANCE WITH PREVENTION  
OF SIGNIFICANT DETERIORATION REQUIREMENTS

 **Black & Veatch**  
Engineers-Architects

DER

JAN 20, 1989 (my)

BAQM

## CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1-1
2.0 PROJECT DESCRIPTION	2-1
3.0 POLLUTANT APPLICABILITY	3-1
3.1 BACKGROUND	3-1
3.2 ESTIMATED POTENTIAL EMISSIONS	3-1
4.0 BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS	4-1
4.1 PARTICULATE BACT	4-1
4.2 SULFUR DIOXIDE (SO <sub>2</sub> ) BACT	4-1
4.3 NITROGEN OXIDE (NO <sub>x</sub> ) BACT	4-2
4.4 CARBON MONOXIDE (CO) BACT	4-3
4.5 VOLATILE ORGANIC HYDROCARBONS (VOC) BACT	4-3
5.0 AIR QUALITY ASSESSMENT METHODOLOGY	5-1
5.1 APPLICABLE AIR QUALITY DISPERSION MODELS	5-1
5.2 METEOROLOGICAL DATA	5-1
5.3 PROPOSED COMBUSTION TURBINE SOURCE PARAMETERS	5-2
5.4 APPLICABLE AIR QUALITY ANALYSES	5-2
6.0 ADDITIONAL IMPACT ANALYSIS	6-1
6.1 VISIBILITY IMPAIRMENT	6-1
6.2 SOILS AND VEGETATION	6-1
6.3 GROWTH	6-1

APPENDIX SUMMARY OF APPLICABLE DISPERSION MODELING RUNS

CONTENTS (Continued)

LISTS OF TABLES

	<u>Page</u>
Table 3-1 COMPARISON OF PROPOSED EMISSIONS AND SIGNIFICANT EMISSION RATES	3-2
Table 5-1 SUMMARY OF COMBUSTION TURBINE MODELING PARAMETERS	5-3
Table 5-2 PREDICTED MAXIMUM GROUND-LEVEL IMPACT FROM FOUR COMBUSTION TURBINES FIRING DISTILLATE OIL	5-5
Table 5-3 COMPARISON OF MAXIMUM IMPACTS AND SIGNIFICANT IMPACT CRITERIA	5-7

LIST OF FIGURES

	<u>Following Page</u>
Figure 2-1. PROPOSED PLANT ARRANGEMENT	2-1

ORLANDO UTILITIES COMMISSION  
INDIAN RIVER COMBUSTION TURBINE FACILITY

APPLICATION TO CONSTRUCT

1.0 INTRODUCTION

Orlando Utilities Commission (OUC) currently has three operating oil and gas fueled boilers producing steam for the generation of electricity at the Indian River Plant located about 10 km south of Titusville. OUC plans to install up to four new simple cycle combustion turbines, each with an electrical generation capacity of about 35 megawatts (MW), at the Indian River Plant.

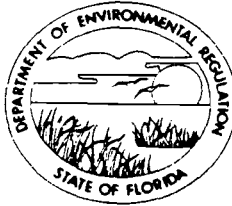
In the Air Quality Work Plan previously reviewed by Florida's Department of Environmental Regulation (FDER), it was mentioned that this application would be made for either of two different types of combustion turbines. However, at this time it appears that only one type of turbine will need to be modeled. Therefore, this application is based on the emission characteristics of only the GE Frame 6 combustion turbines.

This prevention of significant deterioration (PSD) permit application is for four combustion turbines. A completed air permit application form (DER Form 17-1.202(1)) is provided at the end of this section. The permit application form references other sections of this application. This application consists of the following sections.

- o 1.0 Introduction (with completed application form).
- o 2.0 Project Description.
- o 3.0 Pollutant Applicability.
- o 4.0 Best Available Control Technology (BACT) Analysis.
- o 5.0 Air Quality Assessment Methodology.
- o 6.0 Additional Impacts Analysis.

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING  
2600 BLAIR STONE ROAD  
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ  
GOVERNOR  
DALE TWACHTMANN  
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Combustion Turbine Facility [X] New<sup>1</sup> [ ] Existing<sup>1</sup>

APPLICATION TYPE: [X] Construction [ ] Operation [ ] Modification

COMPANY NAME: Orlando Utilities Commission COUNTY: Brevard

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) 4 Unit Combustion Turbine Facility

SOURCE LOCATION: ~~Source~~ Indian River Plant City Titusville (10 km north of site)

UTM: East 521.5 km North 3151.6 km

Latitude 28 ° 29 ' 32 "N Longitude 80 ° 46 ' 59 "W

APPLICANT NAME AND TITLE: Orlando Utilities Commission

APPLICANT ADDRESS: 500 South Orange Avenue, Orlando, Florida 32802

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative\* of Orlando Utilities Commission

I certify that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

\*Attach letter of authorization. Signed: [Signature]

William H. Herrington, Manager Electric Operations  
Name and Title (Please Type)

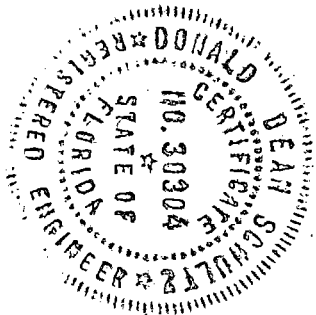
Date: 1/5/88 Telephone No. 305-423-9140

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

<sup>1</sup> See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.



Signed D D Schultz

Donald D. Schultz  
Name (Please Type)

Black & Veatch, Engineers-Architects  
Company Name (Please Type)

P. O. Box 8405, Kansas City, Missouri 64114  
Mailing Address (Please Type)

Florida Registration No. 30304 Date: November 20, 1980 telephone No. 913-339-2000

**SECTION II: GENERAL PROJECT INFORMATION**

- A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

See Section 2.0 of the Application to Construct

- B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction October 1988 Completion of Construction September 1989

- C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The combustion turbine facility will be equipped with water injection to control NO<sub>x</sub> emissions. However, a cost estimate for the water treatment and injection system is not available at this time.

- D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

None

E. Requested permitted equipment operating time: hrs/day \_\_\_\_\_; days/wk \_\_\_\_\_; wks/yr \_\_\_\_\_; if power plant, hrs/yr 8760; if seasonal, describe: \_\_\_\_\_

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No
    - a. If yes, has "offset" been applied? N/A
    - b. If yes, has "Lowest Achievable Emission Rate" been applied? N/A
    - c. If yes, list non-attainment pollutants. N/A
  2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. Yes
  3. Does the State "Prevention of Significant Deterioration" (PSD) requirement apply to this source? If yes, see Sections VI and VII. Yes
  4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? Yes
  5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No
- H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No
- a. If yes, for what pollutants? N/A
  - b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.



SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
N/A				

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A

2. Product Weight (lbs/hr): N/A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission <sup>1</sup>		Allowed Emission Rate per Rule 17-2	Allowable Emission lbs/hr	Potential <sup>4</sup> Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
			(SEE SECTION 3.0 OF APPLICATION.)				

<sup>1</sup>See Section V, Item 2.

<sup>2</sup>Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

<sup>3</sup>Calculated from operating rate and applicable standard.

<sup>4</sup>Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
SEE SECTION 4.0 OF APPLICATION				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input at 59 F (MMBTU/hr)
	avg/hr	max./hr	
Natural Gas		0.49 mcf/hr	~445
Distillate Fuel Oil		3,122 gal/hr	~436

\*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: (Typical No. 2 Fuel Oil)

Percent Sulfur: 0.2 (0.30 max) Percent Ash: \_\_\_\_\_

Density: 7.09 lbs/gal Typical Percent Nitrogen: \_\_\_\_\_

Heat Capacity: 19,696 BTU/lb 139,645 BTU/gal

Other Fuel Contaminants (which may cause air pollution): \_\_\_\_\_

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average None Maximum None

G. Indicate liquid or solid wastes generated and method of disposal.

No solid wastes or wastewaters will be generated.

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack): for Fuel 0

Stack Height: 36 ft. Stack Dimensions: 10 ft x 12 ft.  
 (rectangular)  
 Gas Flow Rate: 697,015 ACFM          DSCFM Gas Exit Temperature: 1003 °F.  
 Water Vapor Content: ~8 % Velocity: 96.8 FPS

SECTION IV: INCINERATOR INFORMATION

N/A

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq. & Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste \_\_\_\_\_

Total Weight Incinerated (lbs/hr) \_\_\_\_\_ Design Capacity (lbs/hr) \_\_\_\_\_

Approximate Number of Hours of Operation per day \_\_\_\_\_ day/wk \_\_\_\_\_ wks/yr. \_\_\_\_\_

Manufacturer \_\_\_\_\_

Date Constructed \_\_\_\_\_ Model No. \_\_\_\_\_

	Volume (ft) <sup>3</sup>	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: \_\_\_\_\_ ft. Stack Diameter: \_\_\_\_\_ Stack Temp. \_\_\_\_\_

Gas Flow Rate: \_\_\_\_\_ ACFM \_\_\_\_\_ DSCFM\* Velocity: \_\_\_\_\_ FPS

\*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device:  Cyclone  Wet Scrubber  Afterburner  
 Other (specify) \_\_\_\_\_

Brief description of operating characteristics of control devices: \_\_\_\_\_

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

### SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.
10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

**SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY**

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

Yes  No

Contaminant	Rate or Concentration
SO <sub>2</sub>	152 ppmvd or 0.80 percent S in fuel
NO <sub>x</sub>	75 ppmvd (plus heat rate adjustment)

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

Yes  No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
SO <sub>2</sub>	55 ppmvd (fuel oil)
NO <sub>x</sub>	65/42 ppmvd (fuel oil/natural gas)
CO	10 ppmvd
VOC	5 ppmvd

D. Describe the existing control and treatment technology (if any). See Section 4.0 of the Application

1. Control Device/System:

2. Operating Principles:

3. Efficiency:\*

4. Capital Costs:

\*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant

Rate or Concentration

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height:

ft.

b. Diameter:

ft.

c. Flow Rate:

ACFM

d. Temperature:

°F.

e. Velocity:

FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary). See Section 4.0 of Application.

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:<sup>1</sup>

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:<sup>2</sup>

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:<sup>1</sup>

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:<sup>2</sup>

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

<sup>1</sup>Explain method of determining efficiency.

<sup>2</sup>Energy to be reported in units of electrical power - KWH design rate:

- j. Applicability to manufacturing processes:
- k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

- a. Control Device:
- b. Operating Principles:
- c. Efficiency:<sup>1</sup>
- d. Capital Cost:
- e. Useful Life:
- f. Operating Cost:
- g. Energy:<sup>2</sup>
- h. Maintenance Cost:
- i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

- k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

- a. Control Device:
- b. Operating Principles:
- c. Efficiency:<sup>1</sup>
- d. Capital Costs:
- e. Useful Life:
- f. Operating Cost:
- g. Energy:<sup>2</sup>
- h. Maintenance Cost:
- i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

- k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected: See Section 4.0 of Application

- 1. Control Device:
- 2. Efficiency:<sup>1</sup>
- 3. Capital Cost:
- 4. Useful Life:
- 5. Operating Cost:
- 6. Energy:<sup>2</sup>
- 7. Maintenance Cost:
- 8. Manufacturer:
- 9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

<sup>1</sup>Explain method of determining efficiency.

<sup>2</sup>Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:<sup>1</sup>

Contaminant

Rate or Concentration

Contaminant	Rate or Concentration

(8) Process Rate:<sup>1</sup>

b. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:<sup>1</sup>

Contaminant

Rate or Concentration

Contaminant	Rate or Concentration

(8) Process Rate:<sup>1</sup>

10. Reason for selection and description of systems:

<sup>1</sup>Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

### SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data No pre-construction monitoring is required--see Section 5.0 of the Application.

1. \_\_\_\_\_ no. sites \_\_\_\_\_ TSP \_\_\_\_\_ ( ) SO<sub>2</sub>\* \_\_\_\_\_ Wind spd/dir

Period of Monitoring \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ to \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
month day year month day year

Other data recorded \_\_\_\_\_

Attach all data or statistical summaries to this application.

\*Specify bubbler (B) or continuous (C).



2. Instrumentation, Field and Laboratory

- a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No
- b. Was instrumentation calibrated in accordance with Department procedures?  
[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. 5 Year(s) of data from 01 / 01 / 81 to 12 / 31 / 85  
month day year month day year
2. Surface data obtained from (location) Orlando, Florida
3. Upper air (mixing height) data obtained from (location) Tampa, Florida
4. Stability wind rose (STAR) data obtained from (location) N/A

C. Computer Models Used

1. PTPLU-2 (UNAMAP 6) Modified? If yes, attach description.
2. ISCST (UNAMAP 6) Modified? If yes, attach description.
3. \_\_\_\_\_ Modified? If yes, attach description.
4. \_\_\_\_\_ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
	1.26 g/s/unit (oil)	
TSP(and PM <sub>10</sub> )	<u>0.31 g/s/unit (natural gas)</u>	grams/sec
	17.98 g/s/unit (oil)	
SO <sub>2</sub>	<u>3.20 g/s/unit (natural gas)</u>	grams/sec

E. Emission Data Used in Modeling. See Sections 5.0 and 6.0 of Application

Attach list of emission sources. Emission data required is: source name, description of point source (on NEDS point number), ELEM coordinates, stack data, allowable emissions, low and normal operating time.

F. Attach all other information supportive to the PSD review. See Application

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources. See Section 4.0 of Application

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology. See Section 4.0 of Application

## 2.0 PROJECT DESCRIPTION

The project includes the installation of two 35 MW (approximate rating at site conditions) combustion turbine generators. The proposed site arrangement is shown in Figure 2-1. Provisions are being made for the installation of up to two additional combustion turbine generators in the future. This application is being made for all four units in phased construction for the final two units. For purposes of this PSD permit, construction on the third and fourth combustion turbines is currently scheduled to commence on November 1, 1989 and November 1, 1990. The project also includes the relocation of a 1 MW diesel generator from OUC's Lake Highland Plant to the Indian River Plant Site.

Included in the project is the installation of a new demineralized water storage tank, a new No. 2 fuel oil storage tank, and warehouse for storage of the combustion turbine generator spare parts. The existing demineralizer and fuel oil unloading system will be used on this project.

The combustion turbines are being designed for firing on either natural gas or No. 2 fuel oil. The combustion turbines are also designed with black start capability.

This project will result in full compliance with applicable air pollution laws and regulations.



### 3.0 POLLUTANT APPLICABILITY

#### 3.1 BACKGROUND

The Indian River area is currently designated attainment for all "criteria" pollutants. Table 3-1 lists those pollutants designated as criteria pollutants. Criteria pollutants are those for which EPA has established ambient air quality standards, i.e., particulates, sulfur dioxide, nitrogen oxides, carbon monoxide, ozone (VOC), and lead. Therefore, nonattainment review requirements will not be applicable to the project, but the project may be subject to the Prevention of Significant Deterioration (PSD) Program. The PSD Program is designated to protect the air quality in air sheds which currently are designated as attainment or unclassified for criteria pollutant.

New sources which have the potential to emit any criteria pollutant in excess of 100 tons per year (tpy) will be subject to PSD review. Since the project will have the potential to emit more than 100 tpy of a criteria pollutant, the project is subject to PSD review.

Once a source has been determined to be subject to PSD review, each regulated pollutant that is potentially emitted in excess of designated significance levels (given in Table 3-1) is subject to PSD review. The review process for those pollutants emitted in excess of the indicated significance levels includes a determination of Best Available Control Technology (BACT) and an air quality impact analysis.

#### 3.2 ESTIMATED POTENTIAL EMISSIONS

Estimates of maximum potential emissions during natural gas or distillate oil firing for the four proposed combustion turbines are provided in Table 3-1. These estimates are based on all four combustion turbines operating at 100 percent capacity for the entire year. From this table, it is apparent that all criteria pollutants are estimated to be emitted in excess of the PSD significance levels.

Emissions of nitrogen oxides and sulfur dioxide are limited by Federal New Source performance Standards (NSPS) under Subpart GG of 40 CFR 60. However, the combustion turbines will be subject to Best Available Control Technology (BACT) for these pollutants. For the air quality assessment, it

TABLE 3-1. SUMMARY OF AIR EMISSIONS FROM GENERAL ELECTRIC  
FRAME 6 COMBUSTION TURBINES.

Pollutant	Fuel	Maximum Emissions Per Unit lb/h	Potential Annual Emissions*		Significant Emission Rate t/yr
			1 Unit t/yr	4 Units t/yr	
Carbon Monoxide	Gas	10.0	22	88 177	100
	Oil	10.1 ✓	22	88 177	100
Nitrogen Oxides (as NO <sub>2</sub> )	Gas	75.1	164	658	40
	Oil	118.3 ✓	259	1,036 2073	40
Sulfur Dioxide	Gas	25.4	56	223	40
	Oil	142.7 ✓	625	2,500	40
Total Particulate	Gas	2.5	5.5	22	25
	Oil	10.0 ✓	22	88 175	25
PM <sub>10</sub>	Gas	2.5 ✓	5.5	22	15
	Oil	10.0 ✓	22	88 175	15
VOC	Gas	4.0	8.8	35	40
	Oil	4.0 ✓	8.8	35 70	40

\*Based on 8,760 hours of full load operation per year.

NOTE: The emissions are for operation at sea level and 59 F.

has been assumed that an emission rate for sulfur dioxide of 55 ppmvd (at 15 percent oxygen) will be determined to be BACT.

Nitrogen oxide emission estimates have been based on an assumed BACT outlet concentration of 42 ppmvd (at 15 percent oxygen) while burning natural gas and 65 ppmvd (at 15 percent oxygen) while burning distillate oil. These emissions will be controlled through the use of water injection and represent emission rates below NSPS.

All other pollutant emission rates were obtained from the turbine manufacturer.

#### 4.0 BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS

Previous sections of this application concluded that the project's emissions of particulates, sulfur dioxide,  $\text{NO}_x$ , carbon monoxide, and volatile organic hydrocarbons were subject to the provisions of the PSD Program. Consequently, this discussion of the appropriate best available control technology (BACT) for the project addresses control technologies/practices for these pollutants.

Under the federal Clean Air Act, BACT represents the maximum degree of pollutant reduction determined on a case-by-case basis after consideration of environmental, energy, and economic factors. However, BACT cannot be less stringent than the emission limits imposed through any applicable new source performance standards (NSPS).

##### 4.1 PARTICULATE BACT

The emission of particulates from the combustion turbine facility will be controlled by ensuring as complete combustion of the fuel as possible. The NSPS for combustion turbines do not establish any emission limit for particulates. A review of the EPA's BACT/LAER Clearinghouse - A Compilation of Control Technology Determinations" (1985 edition) and its May 1986 supplement did not reveal any more stringent particulate control technologies being used on gas/oil fueled combustion turbines. Therefore, OUC proposes to implement measures to ensure as complete combustion of the fuel as possible as its BACT for particulates, especially those particulates smaller than 10 microns ( $\text{PM}_{10}$ ).

##### 4.2 SULFUR DIOXIDE ( $\text{SO}_2$ ) BACT

The emission of sulfur dioxide ( $\text{SO}_2$ ) from the combustion turbine will be controlled by limiting the sulfur content of the distillate fuel oil to 0.30 percent by weight and by limiting sulfur dioxide emissions to 55 ppmvd at 15 percent oxygen. This BACT is 63 percent more stringent than the requirements of the NSPS for combustion turbines. OUC can obtain fuel oil meeting the 0.30 percent sulfur limit at no additional cost over the oil

used to comply with the NSPS limitation. The use of flue gas scrubbers is not practical for combustion turbines and has not been proposed as BACT for any combustion turbine project listed in the EPA BACT/LAER Compilation or its supplement.

#### 4.3 NITROGEN OXIDES (NO<sub>x</sub>) BACT

The combustion turbine NSPS imposes a 75 ppmvd (plus heat rate adjustment) emission limit at 15 percent oxygen for NO<sub>x</sub>. Therefore, this represents the "upper bound" of NO<sub>x</sub> BACT for the project. Compliance with the 75 ppmvd NO<sub>x</sub> emission limit requires that water or steam be injected into the combustion chamber of the turbine to lower combustion temperatures and retard the formation of thermal NO<sub>x</sub> from the nitrogen in the combustion air. The degree of reduction in NO<sub>x</sub> formation is somewhat proportional to the amount of water injected into the turbine.

Since the combustion turbine NSPS was last revised in 1982, combustion turbines have improved their tolerance to the water necessary to control NO<sub>x</sub> emissions below the new source level. However, there is still a point where the amount of water injected into the turbine seriously degrades its reliability and operational life. This generally occurs at NO<sub>x</sub> emission levels of about 65 ppmvd (with no heat rate adjustment) on oil and 42 ppmvd on natural gas. Since these NO<sub>x</sub> emission levels can be achieved with little additional costs and with little impact on reliability over those required to comply with the NSPS, OUC proposes 65/42 ppmvd at 15 percent oxygen as NO<sub>x</sub> BACT for this project.

Use of the 65/42 ppmvd NO<sub>x</sub> emission level as BACT is supported by the EPA BACT/LAER Compilation and its supplement since no combustion turbine project outside of California apparently will be limited to NO<sub>x</sub> emissions below this level. (BACT listings from California in the EPA BACT/LAER Compilation are not included in this analysis because California uses a "LAER-based" approach to BACT determinations where costs are ignored.)

There are three possible NO<sub>x</sub> control technologies used on fuel combustion projects which can achieve NO<sub>x</sub> emissions less than the proposed BACT. However, two of these NO<sub>x</sub> control technologies, multi-port fuel injection and Thermal DeNox, are not available for this project.



Multi-port fuel injection, although available for larger GE combustion turbines, has not yet been developed for Frame 6 turbines. Thermal DeNOx is effective with higher flue gas temperatures (about 1600 F) found in coal combustion, but is ineffective at the lower flue gas temperatures (about 1000 F) found on combustion turbines. This is confirmed by the absence of any mention in the EPA BACT/LAER compilation of use of Thermal DeNOx on combustion turbines. Therefore, the only control technology capable of achieving NO<sub>x</sub> emission rates less than the proposed BACT for this project is selective catalytic reduction (SCR).

However, SCR is ineffective at temperatures above 700 F. Cooling the flue gas from the combustion turbine to 700 F would require OUC to install steam coils to extract enough flue gas heat to produce thousands of pounds of steam. This steam must then be condensed and that waste heat dissipated by a cooling tower. The modeled NO<sub>x</sub> impacts from the facility is already below significant impact levels. Balancing the economic, energy, and environmental aspects of the SCR technology, as required in a BACT analysis, indicates that the cost of all these facilities clearly outweighs any perceived benefits of the lower NO<sub>x</sub> emissions. Consequently, NO<sub>x</sub> BACT for this simple cycle combustion turbine facility is the use of water injection to achieve NO<sub>x</sub> emission of 65 ppmvd at 15 percent oxygen on oil and 42 ppmvd on gas.

#### 4.4 CARBON MONOXIDE (CO) BACT

The CO emissions from combustion turbines are minimized by ensuring as complete combustion as possible. Although water injection does tend to raise CO emission levels, the increase is not significant at the levels of water injection necessary to achieve NO<sub>x</sub> emissions at the proposed BACT level. The proposed BACT emission rate for CO is 10 ppmvd at 15 percent oxygen. The EPA BACT/LAER Compilation and its supplement do not list any combustion turbine projects using more stringent control technologies to limit CO emissions.

#### 4.5 VOLATILE ORGANIC HYDROCARBONS (VOC) BACT

VOC emissions from combustion turbines are also minimized by ensuring as complete combustion as possible. Although water injection does tend to raise VOC emission levels, the increase is not significant at the levels of water injection necessary to achieve NO<sub>x</sub> emissions at the proposed BACT level. The proposed BACT emission rate for VOC is 5 ppmvd at 15 percent oxygen. The EPA BACT/LAER Compilation and its supplement do not list any combustion turbine projects using more stringent control technologies to limit VOC emissions.

## 5.0 AIR QUALITY ASSESSMENT METHODOLOGY

An analysis of combustion gas emissions was conducted to facilitate the assessment of the impacts of airborne pollutants on ground-level air quality levels, visibility, soils, and vegetation in the project vicinity. This section summarizes the overall air quality assessment methodology including the various modeling data requirements. The assessment methodology was based on EPA's Guideline on Air Quality Models (Revised) July 1986, the UNAMAP 6 dispersion models, and previous discussions with Florida's Department of Environmental Regulation (FDER).

### 5.1 APPLICABLE AIR QUALITY DISPERSION MODELS

EPA's PTPLU-2 and Industrial Source Complex Short-term (ISCST) air quality dispersion models were both used for this air quality assessment. PTPLU-2 was used to indicate the approximate distance at which maximum ground-level concentration can be expected to occur during varying meteorological conditions. This information was used in establishing receptor locations for the refined air quality assessment. Within the refined air quality assessment, ISCST predicted the maximum air quality impacts for determining whether ambient air monitoring and further air quality impact assessments were required.

The following information documents the typical EPA default modeling options that were included in the refined air quality assessment. The Indian River Plant location was considered to be rural for modeling purposes. For unstable through stable atmospheric conditions, the wind profile exponents were 0.07, 0.07, 0.10, 0.15, 0.35, and 0.55, respectively. Other ISCST modeling options implemented included stack-tip downwash, buoyancy induced dispersion, and concentration adjustments for calm periods.

### 5.2 METEOROLOGICAL DATA

Five years of surface and upper air meteorological data were used for the refined air quality analysis. These data were provided by the FDER and were processed into a compatible modeling format. The hourly surface data

were recorded during 1981 through 1985 for nearby Orlando, Florida. The corresponding upper air data were obtained for Tampa, Florida for the same time period.

### 5.3 PROPOSED GAS TURBINE SOURCE PARAMETERS

Four identical GE Frame 6 combustion turbines are being proposed for OUC's Indian River Plant. Natural gas is considered to be the main fuel, but the turbines can also burn distillate oil. The stack parameters and emission rates for a typical unit are summarized in Table 5-1. To reduce air quality modeling computation, these four identical combustion turbines were modeled as one source with four times the individual unit pollutant emission rate. Also, air quality modeling was actually only performed for the SO<sub>2</sub> emissions. The SO<sub>2</sub> emissions were modeled using emission data based on 0.8 percent sulfur fuel oil. The SO<sub>2</sub> impacts from burning 0.30 percent sulfur fuel oil were determined by the ratio of 0.30/0.8 or 0.38. Predicted concentrations for the other pollutants were determined by the ratio of actual pollutant emission rate and SO<sub>2</sub> emission rate.

The proposed combustion turbines stacks will be located approximately 700 feet from the existing Unit 3 building. At this distance, the proposed units will be slightly greater than five times the lesser of the Unit 3 building height (137 feet) or projected building width (173 feet). This location should preclude the potential for aerodynamic building downwash in accordance with EPA's Guideline for Determination of Good Engineering Practice Stack Height.

### 5.4 APPLICABLE AIR QUALITY ANALYSES

Any air quality analysis which supports a PSD permit application should provide a determination of the ambient air monitoring requirements, identification of significant impact areas, and, if required, NAAQS comparison and PSD increment consumption.

For the various analyses, the short-term impacts were based on the highest, second-highest predicted concentrations since the entire five year period was modeled. Based on the difference in stack parameters and emission rates, oil firing will yield worst case pollutant impacts, and thus natural gas fired impacts were not analyzed.

TABLE 5-1. SUMMARY OF GAS TURBINE STACK MODELING PARAMETERS

GE--Frame 6--Distillate Oil 65 ppm NO<sub>x</sub>

Height	=	36 ft
Diameter	=	10 ft by 12 ft (rectangular opening)
		<del>XXXXXXXXXXXXXXXXXXXX</del>
Flow	=	697,015 acfm
Velocity	=	5,808 ft/min (96.8 fps)
Temperature	=	1003 F
SO <sub>2</sub>	=	17.98 g/s/unit
NO <sub>x</sub>	=	14.9 g/s/unit
CO	=	1.26 g/s/unit
VOC	=	0.50 g/s/unit
Particulate	=	1.26 g/s/unit

GE--Frame 6--Natural Gas 42 ppm NO<sub>x</sub>

Height	=	36 ft
Diameter	=	10 ft by 12 ft (rectangular opening)
Flow	=	712,397 acfm
Velocity	=	5,937 fpm (98.9 fps)
Temperature	=	1002 F
SO <sub>2</sub>	=	3.20 g/s/unit
NO <sub>x</sub>	=	9.46 g/s/unit
CO	=	1.26 g/s/unit
VOC	=	0.50 g/s/unit
Particulate	=	0.31 g/s/unit

#### 5.4.1 Determination of Ambient Air Quality Monitoring Requirements

EPA has established significant monitoring concentrations for use as criteria for determining if ambient air monitoring would be required as part of the permitting process. The maximum impact for the project are compared with these criteria for each applicable pollutant criteria. Ambient preconstruction air monitoring would only be required for those pollutants which exceed the applicable criteria.

The ISCST dispersion model and five years of meteorological data were used to determine the maximum ground-level impacts. PTPLU-2 screening modeling indicated that the maximum 1-hour concentration would occur about 1 kilometer from the source. Therefore, twenty model receptor rings were placed along the 36 standard radial directions. The ring distances used were 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.5, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, and 14.0 kilometers.

A summary of the maximum predicted ground-level concentrations for the proposed combustion turbines is presented in Table 5-2. The PSD significant monitoring criteria are also included in Table 5-2. The maximum 3- and 24-hour impacts from the General Electric (GE) units were predicted to occur approximately 10 kilometers south of the plant. The maximum annual concentration was predicted to occur 7.0 kilometers southwest of the plant. An 8-hour CO impact was not directly determined from the ISCST modeling. However, the 3-hour maximum concentration is well below the 8-hour CO monitoring criteria and thus implies that the project will be below the CO monitoring criteria concentration.

As shown Table 5-2, all predicted impacts are below the monitoring criteria. Since all impacts were below the criteria, preconstruction monitoring is not required for any pollutant.

#### 5.4.2 Significant Impact Area Determination

Impact areas need to be established for each applicable pollutant for each averaging time for which a NAAQS exists. In accordance with PSD guidance, the various pollutant impact areas are defined as the circular area whose radius is equal to the greatest distance from the source at which a significant impact level is predicted to exist. If the dispersion

TABLE 5-2. PREDICTED MAXIMUM IMPACT FROM FOUR COMBUSTION TURBINES FIRING DISTILLATE OIL.

<u>Pollutant</u>	<u>Averaging Period</u>	<u>Highest Second-Highest Concentration</u> ug/m**3	<u>Significant Monitoring Criteria</u> ug/m**3	<u>Receptor Location</u>		<u>Year</u>
				<u>Distance</u> km	<u>Direction</u> deg	
SO <sub>2</sub>	24-hour	4.95	13	10.0	180	1982
NO <sub>x</sub>	Annual	0.3	14	7.0	240	1984
Particulate	24-hour	0.3	10	10.0	180	1982
PM <sub>10</sub>	24-hour	0.3	10	10.0	180	1982
CO	8-hour	1.3 <sup>a</sup>	575	10.0	180	1982

<sup>a</sup>Note that the 8-hour CO based on 3-hour maximum concentration.

modeling demonstrates that a pollutant does not produce a significant impact, further air quality assessment of this pollutant is not required.

Table 5-3 compares the air quality significant impact levels with the maximum predicted concentrations. The table shows that no pollutant impacts exceed the significant impacts criteria. Therefore, no further ambient air quality assessment is required.

The Appendix contains the dispersion modeling printouts for the computer runs which produced these results.



TABLE 5-3. COMPARISON OF MAXIMUM IMPACTS AND SIGNIFICANT IMPACT CRITERIA.

<u>Pollutant</u>	<u>Maximum Predicted Concentration</u> ug/m**3	<u>Significant Impact Criteria</u> ug/m**3	<u>Significant Impact</u>
SO <sub>2</sub>			
3-hour	20.3 ✓	25	<del>Yes</del> NO
24-hour	4.95 ✓	5	<del>Yes</del> No
Annual	0.4 ✓	1	<del>Yes</del> No
PM <sub>10</sub>			
24-hour	0.3 <sup>1</sup> .4	5	No
Annual	0.3 <sup>1</sup> .03	1	No
NO <sub>2</sub>			
Annual	0.3 ✓	1	No
CO			
8-hour	1.3 <sup>a</sup> 1.4 Assume 3-hr conc.	500	No
1-hour	--- <sup>b</sup>	2,000	No

<sup>a</sup>Note that the 8-hour CO concentration is based on a 3-hour impact.

<sup>b</sup>A 1-hour impact was not determined during modeling.

## 6.0 ADDITIONAL IMPACT ANALYSIS

### 6.1 VISIBILITY IMPAIRMENT

An analysis of possible adverse visibility impairment at the nearest PSD Class I area was carried out using the EPA's visibility screening methods. The nearest PSD Class I area is Chassahowitzha Wilderness Area along the west coast of Florida, at a distance of approximately 175 kilometers from the proposed combustion turbines. The results of the Level-1 screening shows that it is highly unlikely that such impairment might occur and no further analysis of potential visibility impacts was performed.

### 6.2 SOILS AND VEGETATION

The NAAQS have been established to protect public health and welfare from any adverse effects of air pollutants. The maximum impacts from all pollutants are below significance levels. Therefore, no adverse effects on soils and terrestrial vegetation are expected.

### 6.3 GROWTH

The addition of four Frame 6 combustion turbines to the Indian River Plant are not expected to induce any secondary growth in the surrounding area.

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING  
2600 BLAIR STONE ROAD  
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ  
GOVERNOR  
DALE TWACHTMANN  
SECRETARY

November 6, 1987

Mr. J. S. Crall, Director  
Environmental Division  
Orlando Utilities Commission  
500 South Orange Avenue  
P.O. Box 3193  
Orlando, Florida 32802

Re: Proposed Air Quality Analysis Work Plan for the Proposed  
Combustion Turbines at the OUC Indian River Plant

Dear Mr. Crall:

I have reviewed your proposed Air Quality Analysis Work Plan for this project and found it to be generally satisfactory. However, there are a few points that must be clarified.

1. For the proposed turbines, a demonstration that aerodynamic downwash is not needed must be included in the application package.
2. Aerodynamic downwash must be considered and modeled, if need be, at all other modeled sources.
3. The Brown Boveri Model GT-8 combustion turbine has higher emission rates for both CO and unburned hydrocarbons when burning gas as compared to oil. The exit velocity difference between burning gas and oil may not be enough to produce reduced impacts when burning gas as compared to oil. Consequently, both fuels should be modeled for CO for this turbine. Furthermore, the burning of gas in this type of turbine produces a potential annual emission of 104 TPY of unburned hydrocarbons. Any net increase of 100 TPY or more of volatile organic compounds subject to new source review would require an ambient impact analysis, including the gathering of ambient air quality data.
4. The modeling of minor sources, less than 20 TPY, is not necessary unless such a source is in the immediate vicinity of your facility.

Mr. J. S. Crall, Director  
Page 2  
November 6, 1987

5. Due to previously modeled high impacts near the Stanton Energy Center, special attention needs to be given to the placement of receptors near the Stanton Energy Center.

If I can be of any further assistance in this matter please don't hesitate to contact me at (904) 488-1344.

Sincerely,



Max A. Linn  
Meteorologist  
Bureau of Air Quality  
Management

ML/ss



SEPT. 9, 1987  
Tallahassee, FL

1. Jim CRALL Orlando Utilities 305/423-9141
2. Steven M. Day Black & Veatch 913/339-2880
3. BRIAN A. PETERMANN BLACK & VEATCH 913 339-2124
4. PRADEEP RAVAL BAQM 904 488 1344
5. Max Linn BAQM (904) 488-1344
6. C H Fancy BAQM 904 488 1344

DO NOT WRITE IN THIS SPACE

PGN-172A

9/9/87

Orlando Utilities

Indian River Plant

Peaking Units

1 to 4 Turbines Oil or N. Gas

Just beyond 5.1 for stack heights

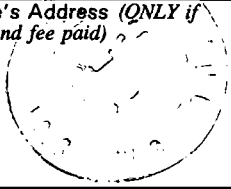
Make a copy of N.C. Screening Techniques ✓

Combined Sources Unit #1 & 2

Ask Tom about data tape for Orlando

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6. Signature - Agent X <i>W. Herrington</i>	
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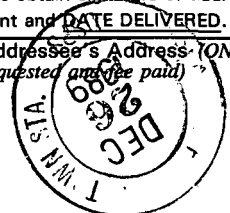
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Street and No.	500 South Orange Ave.
P.O., State and ZIP Code	Orlando, FL 32802
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
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PS Form 3800, June 1985

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<p>3. Article Addressed to:</p> <p>Mr. William Herrington Orlando Utilities Commission 500 South Orange Avenue Orlando, FL 32802</p>	<p>4. Article Number</p> <p>P 938 762 787</p> <p>Type of Service:</p> <p><input type="checkbox"/> Registered      <input type="checkbox"/> Insured  <input checked="" type="checkbox"/> Certified      <input type="checkbox"/> COD  <input type="checkbox"/> Express Mail      <input type="checkbox"/> Return Receipt for Merchandise</p> <p>Always obtain signature of addressee or agent and DATE DELIVERED.</p>
<p>5. Signature — Address</p> <p>X</p>	<p>8. Addressee's Address (ONLY if requested and fee paid)</p> 
<p>6. Signature — Agent</p> <p>X <i>William Herrington</i></p>	
<p>7. Date of Delivery</p>	

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P 938 762 787

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NOV 27 1989

ORLANDO UTILITIES COMMISSION DER - BAQM

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

CERTIFIED MAIL/RETURN RECEIPT REQUESTED

November 21, 1989

Mr. Bill Thomas  
Florida Department of  
Environmental Regulation  
Bureau of Air Regulation  
2600 Blairstone Road  
Tallahassee, FL 32399-2400

Re: PSD-FL-130

Dear Mr. Thomas:

We appreciate your continuing efforts in modifying our PSD construction permit for the four unit combustion turbine project at our Indian River Plant.

We would like to present the following comments on two specific conditions of the proposed modifications to the permit attached to Mr. Fancy's letter of October 26.

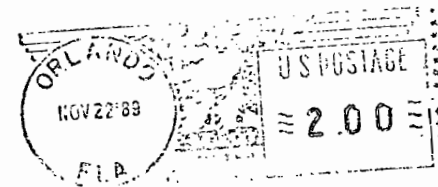
Specific Condition 7 needs to reflect the 20 lbs/hr/unit Total Particulates and PM<sub>10</sub> as described in the Technical Evaluation and Preliminary Determination for Permit Modification signed and sealed on October 26.

Specific Condition 17 appears to be a significant change from the previous language regarding when an operational permit application must be submitted. The original language in the third paragraph of Specific Condition 10 allowed us to apply for an operational permit 90 days prior to expiration of the construction permit, thus recognizing we could make application for all four operational permits at one time. We are concerned that the new language could be read to imply that an application for an operational permit must be sought within 45 days after performance testing of each combustion turbine and, therefore, places us in immediate non-compliance with CT-A and CT-B. We propose to retain the original language in the new format.



ORLANDO UTILITIES  
COMMISSION

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ORLANDO, FLORIDA 32802



*Fold at line over top of envelope to the right  
of the return address.*

**CERTIFIED**

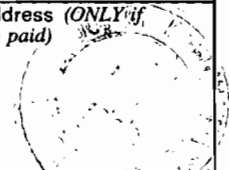
P 971 572 612

**MAIL**

Mr. Bill Thomas  
Florida Department of  
Environmental Regulation  
Bureau of Air Regulation  
2600 Blairstone Road  
Tallahassee, FL 32399-2400

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5. Signature - Address <b>X</b>	8. Addressee's Address ( <i>ONLY if requested and fee paid</i> ) 
6. Signature - Agent <b>X</b> <i>William Herrington</i>	
7. Date of Delivery	

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PSD-FL-130 -146749, -51	
Mailed: 10-27-89	

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United States Department of the Interior  
FISH AND WILDLIFE SERVICE



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MAILING ADDRESS:  
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Denver, Colorado 80225

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Lakewood, Colorado 80228

RW Air Quality  
Mail Stop 60130

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OCT 2 1989  
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Mr. C.H. Fancy, P.E., Deputy Chief  
Bureau of Air Quality Management  
Florida Department of Environmental Regulation  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

We have reviewed the information you forwarded to us regarding Orlando Utilities Commission's request to increase the permitted particulate matter rate for the new gas turbines at their Indian River plant. The Indian River plant is located approximately 175 km east of Chassahowitzka National Wildlife Refuge (NWR), a class I area administered by the U.S. Fish and Wildlife Service. We appreciate your continued cooperation in notifying us of projects that have the potential to impact the air quality or air quality related values of our class I lands.

Results of initial performance tests indicate that particulate matter emissions from turbine CT-A ranged from 12.65 to 19.4 lb/hr (average of 15.3 lb/hr) and particulate matter emissions from turbine CT-B ranged from 17.83 to 24.93 lb/hr (average of 21.9 lb/hr) when burning oil. Based on the performance tests results, Orlando Utilities requests that you increase the permitted limit for the turbines from the current 10 lb/hr rate to 30 lb/hr.

Considering the relatively long distance from the Indian River plant to the Chassahowitzka NWR, we do not expect that the proposed increase in particulate matter emissions would significantly impact resources at the refuge. However, in order to minimize local impacts from the turbine emissions we offer the following comments for your consideration. First, since particulate matter, nitrogen oxides, and sulfur dioxide emissions from the turbines would be much less when burning gas as compared to oil, and the turbines are capable of burning both gas and oil, we recommend that you encourage Orlando Utilities to fire the turbines with gas rather than oil. Also, because turbines CT-A & B are identical, we would expect that the emissions from the turbines would be similar. However, during the performance tests the particulate matter emissions from turbine CT-B averaged over 43% higher than those from turbine CT-A. Unless Orlando Utilities can explain the discrepancy in the test results, and provide

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Mr. C. H. Fancy, P.E.  
Deputy Chief, Bureau of Air Quality Mgmt.  
Florida Dept. of Environ. Reg.  
Twin Towers Office Bldg.  
2600 Blair Stone Rd.  
Tallahassee, FL 32399-2400



ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

September 18, 1989

Mr. Pradeep Raval  
Bureau of Air Quality Management  
Florida Department of  
Environmental Regulation  
2600 Blainstone Road  
Tallahassee, FL 32399-2400

RECEIVED

SEP 19 1989

DER-BAQM

Re: PSD-FL-130 Modification to Permit

Dear Mr. Raval:

Per your request, I had Black & Veatch develop correction factors to be applied to compensate for the location of the ports. Attached is this estimated as supplied to me by Black & Veatch in their letter of September 14, 1989.

If the Department concurs with this estimate and uses it to establish maximum emissions per unit, I request that the calculation be made a part of the permit.

We appreciate your cooperation and understanding in this matter. If you have any questions, please call me at 407/423-9141, Steve Day (B&V) at 913/339-2880 or Al Ferguson (B&V) at 913/339-2199.

Sincerely,

J. S. Crall  
Director  
Environmental Division

JSC/cs  
Attachment

xc: S. M. Day (B&V)

*copied:* Barry Andrews  
Marty Linn  
Rayne Aronson, EPA  
Chris Sharer, NPS  
Chuck Collins, C. Dist.  
EHP/LBT  
Jim Pennington



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Company <b>IR FORWARDING SYSTEMS</b>		Department/Floor No.	Company <b>FL Dept. of Environmental Reg.</b>		Department/Floor No.
Street Address <b>317 EAST LAND STREET RD</b>			Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.) <b>2600 Blistone Rd</b>		
City <b>ORLANDO</b>	State <b>FL</b>	ZIP Required <b>32824</b>	City <b>Tallahassee</b>	State <b>FL</b>	ZIP Required <b>32399</b>

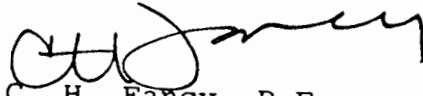
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Mr. J. S. Crall  
Page Two  
August 31, 1989

If you have any questions, please call Pradeep Raval at (904)488-1344 or write to me at the above address.

Sincerely,



C. H. Fancy, P.E.  
Deputy Chief  
Bureau of Air Quality  
Management

CHF/PR/t

cc: J. Pennington, DARM  
C. Collins, C District  
W. Aronson, EPA  
C. Shaver, NPS  
S. Day, Black & Veatch

Reading File

Pradeep Raval

Barry Andrews

Max Limy

} 9-1-89 *ARM*

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938 762 670

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TOTAL Postage and Fees	\$
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PS Form 3800, June 1985





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500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

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AUG 14 1989  
DER-BAQM

August 9, 1989

Mr. C. H. Fancy, Deputy Chief  
Bureau of Air Quality Management  
Fla. Dept. of Environmental Regulations  
2600 Blairstone Road  
Tallahassee, FL 32399-2400

Re: PSD-FL-130

Dear Mr. Fancy:

Preliminary results from initial performance tests of Units 05-144482 (CT-A) and 05-146749 (CT-B) indicate they will not meet the 10 lb/hr emission rate for particulate. Our best information at present is that CT-A averaged between 15-16 lbs/hr and CT-B averaged 22-23 lbs/hr with official results forthcoming. OUC's and GE's best efforts were used to fine tune the water injection to achieve these results.

I have informally discussed this matter with Pradeep Ravel, of your office, on July 28 and on August 3, regarding how to proceed to modify the construction permit. The subject of interim operation was also discussed and it is my understanding that OUC may operate both units complying with all other limitations, without operational constraints, provided OUC requests modification of the permit within 30 days of completion of performance tests. Pradeep also suggested it would be helpful to provide documentation demonstrating that conflicting information was received from GE regarding expected particulate emissions, which I have enclosed with this transmittal.

Please confirm this information is correct and complete.

Sincerely,

James S. Crall  
Director  
Environmental Division

JSC/cs

Enclosures

xc: W. H. Herrington w/encls.  
F. F. Haddad  
S. M. Day (B&V) w/encls.  
P. Ravel (DER)

*B. Andrews*  
*M. Aronson, EPA*  
*C. Collins, CF Dist*  
*CHFYBT*



ORLANDO UTILITIES  
COMMISSION

P. O. BOX 3193  
ORLANDO, FLORIDA 32802



Mr. C. H. Fancy, Deputy Chief  
Bureau of Air Quality Management  
Florida Department of  
Environmental Regulations  
2600 Blainstone Road  
Tallahassee, FL 32399-2400



RECEIVED  
AUG 10 1989



ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

June 6, 1989

Mr. C. H. Fancy, P.E., Deputy Chief  
Bureau of Air Quality Management  
Florida Department of Environmental Regulations  
2600 Blainstone Road  
Tallahassee, FL 32399-2400

Re: **Indian River Plant Combustion  
Turbine Facility**

Dear Mr. Fancy:

On May 30, 1989, I gave notification that the first unit (AC-05-144482) would undergo performance testing on June 13, 1989. Please be advised that the date has been changed to June 20, 1989.

By copy of this correspondence, I am also providing notice to EPA Region IV and the DER Central Florida District Office.

If you have any questions regarding this transmittal, please contact me at (407) 423-9141.

Sincerely,

J. S. Crall  
Director  
Environmental Division

JSC/cs

xc: Winston A. Smith  
Director, Air Division  
EPA Region IV  
345 Courtland Street  
Atlanta, GA 30365

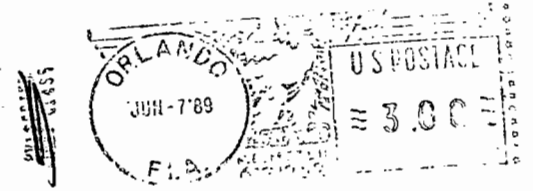
Alex Alexander  
Deputy Assistant Secretary  
FDER/CFD  
3319 Maguire Blvd.d, Suite 232  
Orlando, FL 32803

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JUN 12 1989  
DER-BAQM

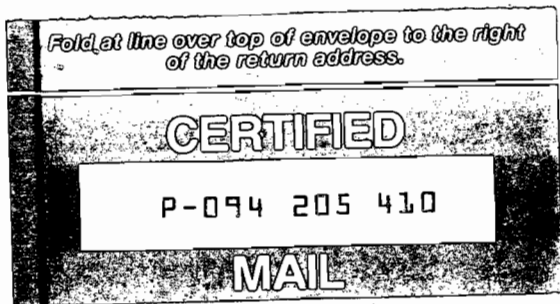


ORLANDO UTILITIES  
COMMISSION

P. O. BOX 3193  
ORLANDO, FLORIDA 32802



Mr. C. H. Fancy, P.E., Deputy Chief  
Bureau of Air Quality Management  
Florida Department of Environmental Regulations  
2600 Blirstone Road  
Tallahassee, FL 32399-2400





ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802

RECEIVED

APR 6 1989

DER-BAQM

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

April 3, 1989

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

Re: Indian River Plant Combustion  
Turbine Facility

Dear Mr. Fancy:

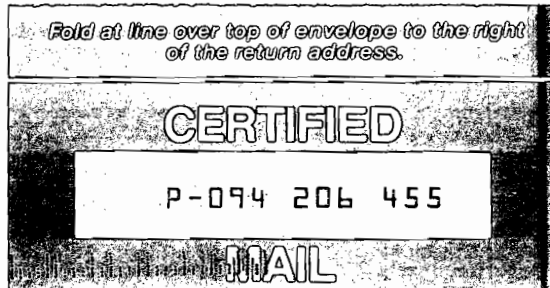
In accordance with specific condition 10 of PSD-FL-130 and Florida Administration Code Rule 17-2, the Orlando Utilities Commission is hereby providing notice of initial startup of the first two units of the subject phased project. Startup for the first unit (AC-05-144482) is planned for May 9, 1989, and is to be followed by startup of the second unit (AC-05-146749) on or about May 30, 1989.

Please be advised that these dates represent the best information available at this time. Notification of the actual date of initial startup for each unit will be provided by this office within fifteen (15) days thereof.

By copy of this correspondence, I am also providing notice to EPA Region IV and the DER Central Florida District Office.



P. O. BOX 3193  
ORLANDO, FLORIDA 32802



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



**SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.  
 Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees, the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1.  Show to whom delivered, date, and addressee's address. (Extra charge)  
 2.  Restricted Delivery (Extra charge)

3. Article Addressed to:  Mr. J. S. Crall Orlando Utilities Commission P. O. Box 3193 Orlando, FL 32802	4. Article Number P 274 007 602
5. Signature - Address <i>Dennis Hugh</i> X	Type of Service: <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail <input type="checkbox"/> Return Receipt for Merchandise
	Always obtain signature of addressee or agent and DATE DELIVERED.
	8. Addressee's Address (ONLY if requested and fee paid)
6. Signature - Agent X	
7. Date of Delivery	

PS Form 3811, Mar. 1988    \* U.S.G.P.O. 1988-212-865    DOMESTIC RETURN RECEIPT

P 274 007 602

**RECEIPT FOR CERTIFIED MAIL**  
 NO INSURANCE COVERAGE PROVIDED  
 NOT FOR INTERNATIONAL MAIL  
 (See Reverse)

* U.S.G.P.O. 1985-480-794          PS Form 3800, June 1985	Sent to Mr. J. S. Crall, OUC	
	Street and No. P.O. Box 3193	
	P.O., State and ZIP Code Orlando, FL 32802	
	Postage	\$
	Certified Fee	
	Special Delivery Fee	
	Restricted Delivery Fee	
	Return Receipt showing to whom and Date Delivered	
	Return Receipt showing to whom, Date, and Address of Delivery	
	TOTAL Postage and Fees	\$
Postmark or Date Mailed: 3-8-89 Permit: AC 05-144482, 146749 -146750, -146751		

PM  
2-24-89  
Orlando, FL

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FEB 27 1989

ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802-3193 407/423-9100

February 23, 1989

Mr. Pradeep Raval  
Bureau of Air Quality Management  
~~FDER~~  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

Re: Indian River Plant Combustion Turbines  
Nos. 05-144482-146749, -146750 and -146751

Dear Mr. Raval:

Per conversation with Black & Beatch and Pete Burnette of Air Consulting and Engineering, I have been advised that method 104 as specified in our subject permits may not be feasible for testing combustion turbines for Beryllium. I understand that both Black & Veatch and Pete Burnette discussed the problem with you, and you advised that OUC could request an initial oil analysis for Beryllium to satisfy SP 8.f.

Please regard this correspondence as OUC's request for permission to substitute a single oil analysis in lieu of Method 104 as specified in our subject permits. We propose to use either Method 7090 or 7091, following extraction by Method 3040 as described in the Solid Waste Testing regulations, SW 846.

Thank you for your attention to this matter and please call me at 407/423-9141 if you need further information or clarification.

Sincerely,

James S. Crall  
Director  
Environmental Division

JSC/cs

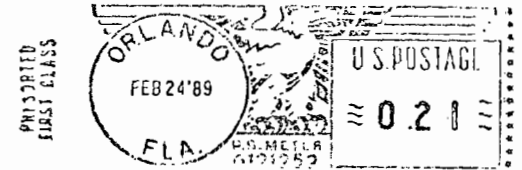
xc: S.M. Day, B&V  
copied: B. Anderson, EPA  
St. Aronson, EPA  
C. Collins, CF Dist  
C.H.F./BT



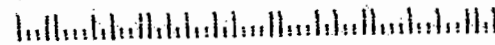


ORLANDO UTILITIES  
COMMISSION

P. O. BOX 3193  
ORLANDO, FLORIDA 32802



Mr. Pradeep Raval  
Bureau of Air Quality Management  
Florida Department of Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400



Certified P 971 547 832  
11-8-88 Orlando, FL

*file copy*



ORLANDO UTILITIES COMMISSION

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CERTIFIED RETURN RECEIPT REQUESTED

November 4, 1988

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NOV 10 1988  
DER-BAQM

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


Dear Mr. Fancy:

Pursuant to and in accordance with 40 CFR Part 60, Chapter 17-2 FAC and PSD-FL-130, the Orlando Utilities Commission is hereby providing notification of commence construction for two of four simple cycle combustion turbines (AC 05-144482 and AC 05-146749) on October 25, 1989 at OUC's Indian River Plant located approximately 10 km south of Titusville.

By copy of this correspondence, I am also providing notice to the DER Central District Office.

If you have any questions regarding this transmittal, please contact me at 407/423-9141.

Sincerely,

  
J.S. Crall  
Director  
Environmental Division

JSC:sp

xc: Alex Alexander, DER  
*copied: Pradeep Raval*  
*St. Bronson, EPA*  
CHF/BT

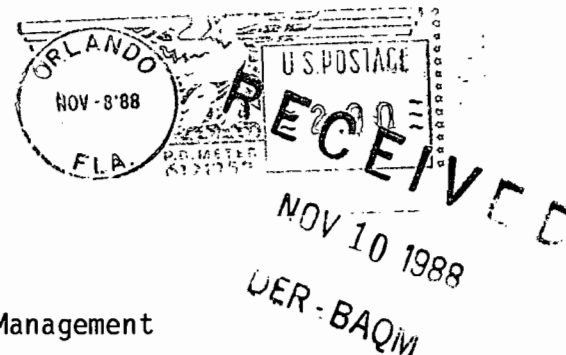


ORLANDO UTILITIES  
COMMISSION

P. O. BOX 3193  
ORLANDO, FLORIDA 32802

CERTIFIED RETURN RECEIPT REQUESTED

Mr. C.H. Fancy, P.E.  
Deputy Chief  
Bureau of Air Quality Management  
Florida Department of  
Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 323



*Fold at line over top of envelope to the right  
of the return address.*

**CERTIFIED**

P 971 587 832



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1.  Show to whom delivered, date, and addressee's address.      2.  Restricted Delivery  
 ↑(Extra charge)↑      ↑(Extra charge)↑

3. Article Addressed to:  Mr. William Herrington Orlando Utilities Commission 500 South Orange Avenue Orlando, FL 32802	4. Article Number P 938 762 891 Type of Service: <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail Always obtain signature of addressee or agent and <u>DATE DELIVERED.</u>
5. Signature - Addressee X <i>Mal H. Jr</i>	8. Addressee's Address (ONLY if requested and fee paid)
6. Signature - Agent X	
7. Date of Delivery SEP 7 1988	

PS Form 3811, Mar. 1987

★ U.S.G.P.O. 1987-178-268

DOMESTIC RETURN RECEIPT

To \_\_\_\_\_  
 Date *Attachment for*  
**V** *Orlando Utilities*  
 M \_\_\_\_\_  
 of \_\_\_\_\_ *Kim has letter.*  
 Phone \_\_\_\_\_  
*Orig. - Certified*  
*{ Jim Crall - Fed Exp.*  
*{ His copy*  
*Tom Sawicki - copy*

<input type="checkbox"/>	TE
<input type="checkbox"/>	CA
<input type="checkbox"/>	W

Message *1089-9928-4*  
*Orlando Utilities*  
*1089-9928-4 Fed Exp*

Operator \_\_\_\_\_

P 938 762 891

**RECEIPT FOR CERTIFIED MAIL**  
 NO INSURANCE COVERAGE PROVIDED  
 NOT FOR INTERNATIONAL MAIL  
 (See Reverse)

Send to Mr. William Herrington Orlando Utilities Commission 500 South Orange Avenue	
P.O., State and ZIP Code Orlando, FL 32802	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Mailed date 09/02/88 PERMITS: AC 05-144482, -146749, -146750 & -146751	

PS Form 3800, June 1985

*file copy*



**ORLANDO UTILITIES COMMISSION**

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 305/423-9100  
CERTIFIED RETURN RECEIPT REQUESTED

August 17, 1988

Florida Department of  
Environmental Regulation  
Bureau of Air Quality Management  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400  
ATTN: Mr. Bill Thomas

**RECEIVED**

**AUG 22 1988**

**DER-BAQM**

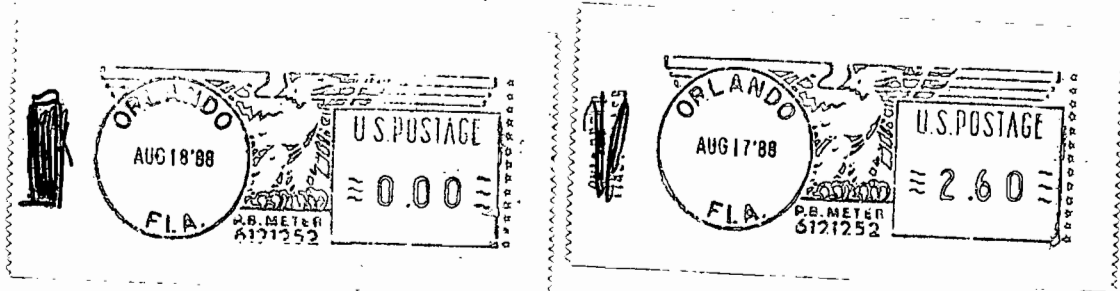
Dear Mr. Thomas:

We appreciate your continuing efforts in the processing of our PSD permit application for the four unit combustion turbine project at the Indian River Plant, Brevard County, Florida.

We would like to present the following comments on four of the specific conditions contained in the proposed permit attached to your letter of July 18.

Specific Condition 3 incorrectly specifies the maximum heat input. Each turbine is baseload rated at 445 Million BTU/hr (not 112) on oil at sea level and 59° F as specified in Section III E of the application. As you are aware, the ambient temperature affects the capacity of combustion turbines with lower temperatures serving to increase their maximum heat input firing rate. The amount of water required for NO<sub>x</sub> control also affects turbine performance. The enclosed two figures of heat input vs. temperature provide the range of heat input values expected for the GE frame 6 turbine for oil and natural gas. The center line on each figure is the rated baseload curve with maximum water injection. The top line represents the peak load values which could be sustained for only short periods of time without extensive maintenance. This line has also been adjusted to represent the higher heating value of the fuel (HHV). The bottom line represents the baseload condition with no water injection and is adjusted to represent the lower heating value of the fuel (LHV). Thus the figures provide the "normal" maximum capability vs. temperature and the range around that value. Based on the preceding discussion, Condition 3 should read, "The maximum heat input to each turbine shall not exceed the maximum values in the attached Figures of Heat Input vs. Temperature for the OUC Indian River Combustion Turbines." OUC is also providing copies of various GE correction charts and letter of expected performance which were used to develop the two Figures.

Specific condition 12 is currently incorrect as written since the proposed Unit 3 commence construction date is within 18 months of



*Fold at line over top of envelope to the right  
of the return address*

**CERTIFIED**

P 744 170 244

**MAIL**

Fed. Ex.  
7-27-88, Orlando FL  
Airbill # 431470972

*file copy*



ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 305/423-9100

July 27, 1988

RECEIVED

C.H. Fancy, Deputy Chief  
Bureau of Air Quality Management  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

JUL 28 1988

DER-BAQM

RE: Permit Numbers: AC 05-144482  
05-146749  
05-146750  
05-146751

Dear Mr. Fancy:

Enclosed please find the proof of publication for OUC's Combustion Turbine Project at the Indian River Plant.

Please feel free to call me at (407)423-9141 if you have questions or comments regarding this permit.

Sincerely,

*J.S. Crall for*  
J.S. Crall  
Director  
Environmental Division

JSC:sp

Enclosures

xc: W.H. Herrington  
T.L. Smith  
S.M. Day, B&V

*Copied: Pradeep Rawal  
Max Linn  
Barry Andrews  
Tom Saccucci, CF Dietl  
Wayne Cronson, EPA  
Miguel Flores, NPS*



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 FILL OUT PURPLE AREAS. FOR ASSISTANCE, CALL 800-238-5355 TOLL FREE.  
 SEE BACK OF FORM SET FOR COMPLETE PREPARATION INSTRUCTIONS.

SENDER'S FEDERAL EXPRESS ACCOUNT NUMBER

DATE

91788

1089-9928-4

07-27-88

1 From (Your Name) <b>J.S. Crall</b>		Your Phone Number (Very Important) <b>(407) 423-9141</b>		2 To (Recipient's Name) <b>C.H. Fancy</b>		Recipient's Phone Number (Very Important) <b>(904) 488-1344</b>	
Company <b>ORLANDO UTILITIES COMMISSION</b>		Department/Floor No.		Company <b>Bureau of Air Quality Management</b>		Department/Floor No.	
Street Address <b>500 S ORANGE AVE ROOM 408</b>							
City <b>ORLANDO</b>				State <b>FL</b>			

AIRBILL NO. <b>431870972</b>	ZIP Zip Code Required For Correct Invoicing <b>32801</b>	ZIP Street Address Zip Required (No P.O. Box Zip Code) <b>32399-2400</b>
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3 YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE.)		HOLD FOR PICK-UP AT THIS FEDERAL EXPRESS STATION: Street Address (See Service Guide or Call 800-238-5355)		Federal Express Use	
PAYMENT <input checked="" type="checkbox"/> Bill Shipper <input type="checkbox"/> Bill Recipient's FedEx Acct. No. <input type="checkbox"/> Bill 3rd Party FedEx Acct. No. <input type="checkbox"/> Bill Credit Card		City		Base Charges	
<input type="checkbox"/> Cash <input type="checkbox"/> FedEx Acct. No. or Major Credit Card No.		State		Declared Value Charge	

4 SERVICES CHECK ONLY ONE BOX		DELIVERY AND SPECIAL HANDLING CHECK SERVICES REQUIRED		PACKAGES	WEIGHT	YOUR DECLARED VALUE	OVER SIZE	ZIP Zip Code of Street Address Required	
1 <input type="checkbox"/> <b>PRIORITY 1</b> Overnight Delivery Using Your Packaging		1 <input type="checkbox"/> <b>HOLD FOR PICK-UP</b> Give the Federal Express address where you want package held in Section II at right.						Emp. No. Date	
2 <input type="checkbox"/> <b>OVERNIGHT LETTER</b> (Our Packaging) 9"x12"		2 <input checked="" type="checkbox"/> <b>DELIVER WEEKDAY</b>						<input type="checkbox"/> Cash Received <input type="checkbox"/> Return Shipment <input type="checkbox"/> Third Party <input type="checkbox"/> Chg. To Del. <input type="checkbox"/> Chg. To Hold	
3 <input type="checkbox"/> <b>OVERNIGHT DELIVERY USING OUR PACKAGING</b> Courier-Pak Overnight Envelope 12" x 15 1/2"		3 <input type="checkbox"/> <b>DELIVER SATURDAY</b> (Extra charge applies)		Total	Total	Total		Street Address	
4 <input type="checkbox"/> <b>OVERNIGHT BOX</b> 12 1/4" x 17 1/4" x 3" A <input type="checkbox"/>		4 <input type="checkbox"/> <b>RESTRICTED ARTICLES SERVICE</b> (P-1 and Standard Air Packages only. Extra charge applies)						City State Zip	
5 <input type="checkbox"/> <b>OVERNIGHT TUBE</b> 38" x 6" x 6" x 6" B <input type="checkbox"/>		5 <input type="checkbox"/> <b>CONSTANT SURVEILLANCE SERVICE (CSS)</b> (Extra charge applies)		Received At Shipper's Door: <input type="checkbox"/> Regular Stop <input checked="" type="checkbox"/> On-Call Stop <input type="checkbox"/> FedEx Loc.				Received By:	
5 <input type="checkbox"/> <b>STANDARD AIR</b> Delivery not later than second business day		6 <input type="checkbox"/> <b>DRY ICE</b> Lbs.		Federal Express Corp. Employee No. <b>20332</b>				Date/Time Received FedEx Employee Number	
5 <input type="checkbox"/> <b>SERVICE COMMITMENT</b> PRIORITY 1 - Delivery is scheduled early next business morning in most locations. It may take two or more business days if the destination is outside our primary service areas. STANDARD AIR - Delivery is generally next business day or not later than second business day. It may take three or more business days if the destination is outside our primary service areas.		7 <input type="checkbox"/> <b>OTHER SPECIAL SERVICE</b>		Date/Time For Federal Express Use <b>7/27/88</b>				Total Charges	
		8 <input type="checkbox"/>						PART #2041738901 FEC-S-751-1000 REVISION DATE 2/85 PRINTED U.S.A. GBF	
		9 <input type="checkbox"/> <b>SATURDAY PICK-UP OR SATURDAY DROP-OFF</b> (Extra charge applies)							

RECIPIENT'S COPY



# CAPE PUBLICATIONS, INC.

**The Times**

Published Weekly on Wednesday

**THE TRIBUNE**

Published Weekly on Wednesday



**Published Daily**

**STAR-ADVOCATE**

Published Weekly on Wednesday

STATE OF FLORIDA  
COUNTY OF BREVARD

Before the undersigned authority personally appeared Linda L. Spicer who on oath says that he/she is Legal Advertising Clerk of the FLORIDA TODAY, a newspaper published in Brevard County, Florida; that the attached copy of advertising being a Legal Notice of Intent

\_\_\_\_\_ in the matter of \_\_\_\_\_  
State of Florida Dept. of Environmental Regulation  
\_\_\_\_\_ in the \_\_\_\_\_ Court

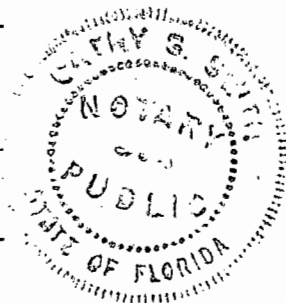
was published in the FLORIDA TODAY NEWSPAPER  
in the issues of July 21, 1988

Affiant further says that the said FLORIDA TODAY NEWSPAPER is a newspaper published in said Brevard County, Florida and that the said newspaper has heretofore been continuously published in said Brevard County, Florida regularly as stated above, and has been entered as second class mail matter at the post office in COCOA, said Brevard County, Florida for a period of one year next preceeding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in said newspaper.

Linda L. Spicer  
Sworn and subscribed to before me this

21st day of July A.D., 1988

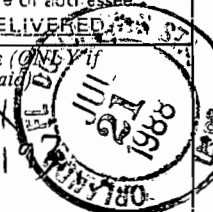
Cathy S. Smith  
Notary Public  
State of Florida at Large  
My Commission Expires March 29, 1992



State of Florida  
Department of  
Environmental Regulation  
Notice of Intent  
The Department of Environmental Regulation hereby gives notice of its intent to issue permits to Orlando Utilities Commission to construct four new simple cycle combustion turbines, each with an electrical generation capacity of about 35 MW, at the existing Indian River Plant, Brevard County, Florida. The Department is issuing this intent to issue for the reasons stated in the Technical Evaluation and Preliminary Determination.  
Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative determination (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Failure to file a petition within this time period constitutes a waiver of any right such person has to request an administrative determination (hearing) under Section 120.57, Florida Statutes.  
If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the proposed agency action. Therefore, persons who may not wish to file a petition may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Rule 28-5.207, Florida Administrative Code, at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009 Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.  
The applications are 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 Regulation  
Bureau of Air Quality Management  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400  
Dept. of Environmental Regulation  
Central Florida District  
3319 Maguire Blvd., Suite 232  
Orlando, Florida 32803-3767  
Any person may send written comments on the proposed action to Mr. Bill Thomas at the department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the department's final determination.  
TOP4630-1T-7/21, 1988,  
Thursday

**SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.  
 Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1.  Show to whom delivered, date, and addressee's address. 2.  Restricted Delivery  
↑(Extra charge)↑ ↑(Extra charge)↑

3. Article Addressed to:  Mr. William Herrington Oalando Utilities Commission 500 South Orange Avenue Orlando, Florida 32802	4. Article Number P 702 175 481  Type of Service: <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail
Always obtain signature of addressee or agent and DATE DELIVERED.	
5. Signature - Addressee <input checked="" type="checkbox"/> <i>Mr. W. H.</i>	8. Addressee's Address (ONLY if requested and fee paid)  PO BOX 31 
6. Signature - Agent <input checked="" type="checkbox"/>	
7. Date of Delivery	

PS Form 3811, Mar. 1987

★ U.S.G.P.O. 1987-178-268

DOMESTIC RETURN RECEIPT

P 702 175 481  
**RECEIPT FOR CERTIFIED MAIL**  
 NO INSURANCE COVERAGE PROVIDED  
 NOT FOR INTERNATIONAL MAIL  
 (See Reverse)

PS Form 3800, June 1985

Sent to Mr. William Herrington, OUC	
Street and No. 500 South Orange A.e.	
P.O., State and ZIP Code Orlando, FL 32802	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date Mailed: 7-18-88	
Permit: AC 05-144482	
AC 05-146749, AC 05-146750	
AC 05-146751	

particulate. A review of the EPA's BACT/LAER Clearinghouse documents did not reveal any post combustion particulate control technologies being used on gas/oil fueled combustion turbines. The natural gas and distillate oil fuels to be used in the proposed combustion turbines will only contain trace quantities of particulate. Therefore, OUC's standard operating procedures will ensure as complete combustion of the fuel as possible and is the proposed BACT for suspended particulate, and particulate matter smaller than 10 microns (PM<sub>10</sub>).

#### 4.5 OTHER CRITERIA AND NON-CRITERIA POLLUTANT EMISSIONS

Section 4.3 addressed removal of other criteria and non-criteria pollutants as a part of flue gas desulfurization. It was determined in Section 4.3 that based on energy, environmental, and economic considerations flue gas desulfurization was not an appropriate choice for the OUC Indian River Combustion Turbine Project.

Table 4-4 lists the estimated emission of other criteria and non-criteria pollutants based on good combustion of the fuel and the inherent quality of the fuel. Emission estimates indicate that significance levels are exceeded for beryllium and sulfuric acid mist. Significance levels do not represent emission limitations, but rather are indicators of whether a BACT review is necessary.

Other than flue gas desulfurization, there are no identified methods for controlling the emission of these pollutants, other than complete combustion of the fuel and the inherent quality of the fuel. Sulfuric acid mist emissions are a direct function of the sulfur content of the fuel. As discussed in Section 4.3, the sulfur content of the fuel oil will be controlled to 0.3 percent. Therefore, based on the results of Section 4.3, BACT regarding beryllium and sulfuric acid mist is complete combustion of the fuel and the inherent quality of the fuel.

RECEIVED

JUN 16 1988

DER-BAQM

FROM  
**BLACK & VEATCH**  
ENGINEERS-ARCHITECTS

P.O. BOX 8405

KANSAS CITY, MO. 64114

---

Mr. Barry Andrew  
Department of Environmental Regulations  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

RECEIVED  
MAY 19 1984  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

Judicial Express File Copy  
no # AC05-144482  
no blue slip

**BLACK & VEATCH**  
ENGINEERS-ARCHITECTS

TEL. (913) 339-2000

1500 MEADOW LAKE PARKWAY  
MAILING ADDRESS P.O. BOX NO. 8405  
KANSAS CITY, MISSOURI 64114

Orlando Utilities Commission  
Indian River Plant  
PSD Permit No. 05-144482

B&V Project 14137.031  
B&V File 22.0400  
June 10, 1988

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**JUN 13 1988**

Bureau of Air Quality - Florida DER  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

**DER-BAQM**

Attention: Mr. Barry Andrews

Gentlemen:

Values for sulfur dioxide emissions when burning natural gas as listed in Table 3-1 of the Indian River permit are in error. The correct SO<sub>2</sub> emission estimates based on use of emission factors contained in AP-42 are as follows.

Maximum SO<sub>2</sub> Emissions Per Unit = 0.34 lb/hr  
Potential Annual SO<sub>2</sub> Emissions = 1.5 tpy/unit  
Total Plant Potential SO<sub>2</sub> Emission = 6.0 tpy (4 units)

We are sorry for any confusion that these erroneous emission estimates have caused during your review of the Indian River permit. If you have any other questions, please call either myself (913-339-2880) or John Cochran (913-339-2190). Thank you for your time and efforts in the review of our permit.

Very truly yours,

BLACK & VEATCH

*S. M. Day/1988*

Steven M. Day

JRC:jrc

cc: W. H. Herrington, OUC  
J. S. Crall, OUC  
T. D. Slepow, OUC  
Janet Hayward, EPA Region IV  
Chun (Gary) NG, EPA Region IV

CHFIBT

Pradeep Raval  
Max Linn  
Barry Andrews  
T. Sawicki - CF Dist. } 6.14.88

FROM  
**BLACK & VEATCH**  
ENGINEERS-ARCHITECTS

P.O. BOX 8405

KANSAS CITY, MO. 64114

---

Bureau of Air Quality - Florida DER  
Attention: Mr. Barry Andrews  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

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MAY 15 1970  
AIR QUALITY  
DIVISION  
TALLAHASSEE, FLORIDA

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TEL. (913) 339-2000

1500 MEADOW LAKE PARKWAY  
MAILING ADDRESS P.O. BOX NO. 8405  
KANSAS CITY, MISSOURI 64114

Orlando Utilities Commission  
Indian River Plant  
PSD Permit No. 05-144482

**RECEIVED**

MAY 18 1988

B&V Project 14137.031  
B&V File 22.0400  
May 17, 1988

Mr. Barry Andrews  
Bureau of Air Quality - Florida DER  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

**DER-BAQM**

FEDERAL EXPRESS

Dear Mr. Andrews:

We hope that information submitted to your office on Friday May 13, 1988 is helpful in your consideration of our BACT submittal. The NO<sub>x</sub> abatement information by General Electric should be especially beneficial for the review of any combustion turbine permit.

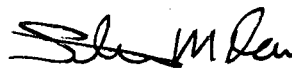
During our review of OUC's revised BACT analysis we have found an error. The volatile organic compound (VOC) emission rate stated in the permit application and the BACT analysis does not match the guarantee in OUC's contract agreement with GE. Emission guarantees from GE assure that VOC emissions will be no greater than 7 ppmvw from the Frame 6 combustion turbines. This emission corresponds to an emission rate of 0.009 lb/MBtu or 4.0 lb/hr, rather than the 5 ppmvd stated in the permit application. General Electric is unwilling to guarantee VOC emissions below 7 ppmvw. The application already correctly specifies 4.0 lb/hr as the maximum emission rate, and therefore, Table 3-1 requires no modification.

BACT/LAER Clearinghouse documents do not list any combustion turbine projects with more stringent emission requirements than 0.013 lb/MBtu. Therefore, the use of combustion turbines designed to meet a VOC emission rate of 7 ppmvw at 15 percent oxygen (lower than any other Clearinghouse limit) is proposed as BACT, rather than the previously incorrectly specified 5 ppmvd.

If you have any questions regarding VOC emissions or any other topics pertaining to the review of our BACT analysis please call either myself (913-339-2880) or John Cochran (913-339-2190). Thank you for your time and efforts in the review of our permit.

Very truly yours,

BLACK & VEATCH

  
Steven M. Day

Copies: Radeep Raval  
Max Rinn  
Barry Andrews  
T. Samicki  
CHF/BS } 5.19.88

JRC:jrc

cc: Janet Hayward, EPA Region IV  
Chun (Gary) NG, EPA Region IV  
J. S. Crall, OUC

W. H. Herrington, OUC  
T. D. Slepow, OUC

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P.O. BOX 8405

KANSAS CITY, MO. 64114

Mr. Barry Andrews  
Bureau of Air Quality - Florida DER  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

66643





P M  
8 March 1988  
Orlando, FL

file copy

2268

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### ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 305/423-9100

CERTIFIED RETURN RECEIPT REQUESTED

March 7, 1988

Mr. Pradeep Raval  
Bureau of Air Quality Management  
Florida Department of  
Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

RECEIVED

MAR 11 1988

DER-BAQM

Dear Mr. Raval:

Per our telephone discussion and your letter of February 15, 1988, please find enclosed a check for \$3000 which represents the balance of our application fee in order to permit all four proposed combustion turbine units at our Indian River Plant.

I understand that with this additional fee we will receive a permit that covers the construction of all four units and further additional air permitting for this project will not be necessary if the required schedule for phased construction is met.

Unit #2 = AC 05 - 146749  
Unit #3 = AC 05 - 146750  
Unit #4 = AC 05 - 146751

Cordially,

J. S. Crall  
Director  
Environmental Division

JSC:ch  
Enclosure

xc: W. H. Herrington

Copied: Pradeep Raval  
Tom Rogers  
Barry Andrews  
T. Sawicki } 3-16-88

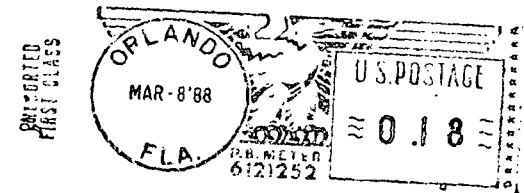
1031



ORLANDO UTILITIES  
COMMISSION

P. O. BOX 3193  
ORLANDO, FLORIDA 32802

Mr. Pradeep Raval  
Bureau of Air Quality Management  
Florida Department of  
Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400



# Orlando Utilities Commission

ORLANDO, FLORIDA

"Where Electricity Powers Progress"

63-215  
631

2268 No. 014108

PAY TO THE  
ORDER OF:

ORLANDO UTILITIES \$3000 and 00 cts

NOT VALID  
AFTER 180 DAYS

FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION  
2600 BLAIR STONE ROAD  
TALLAHASSEE, FLORIDA 32399-2400

DATE

3,000.00

MAR. 7 '88



AUTHORIZED SIGNATURE

SUN BANK, N.A.  
MAIN OFFICE:  
ORLANDO, FLORIDA 32801

ORLANDO UTILITIES COMMISSION P.O. BOX 3193 ORLANDO, FLORIDA 32802

No. 014108

INVOICE DATE	VENDOR INVOICE NUMBER	VOUCHER NUMBER		AMOUNT
L	Balance of application fee to construct all four combustion turbine units at Indian River Plant submitted Jan. 8, 1988.			3,000.00
DISB #	VENDOR NO.	CHECK DATE	TOTAL	

PM  
Mailed in Fed. Ex.  
envelop - no blue  
sheet no stamp PM

file copy

**BLACK & VEATCH**  
ENGINEERS-ARCHITECTS

TEL. (913) 339-2000

**DER**

1500 MEADOW LAKE PARKWAY  
MAILING ADDRESS P.O. BOX NO. 8405  
KANSAS CITY, MISSOURI 64114

Orlando Utilities Commission  
Indian River Plant  
PSD Permit Application

FEB 11, 1988

B&V Project 14137  
B&V File 22.0400  
February 10, 1988

**BAQM**

Mr. C. H. Fancy, Deputy Chief  
Bureau of Air Quality  
Florida Dept of Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

FEDERAL EXPRESS

Dear Mr. Fancy:

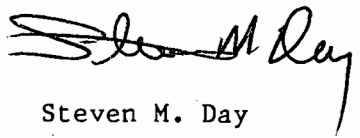
Enclosed are two additional copies of the OUC Indian River Plant Application to Construct which were submitted January 18, 1988. Also enclosed are six copies of revised Table 3-1, Summary of Air Emissions from General Electric Frame 6 Combustion Turbines. The emission rates in pounds per hour were all correct on the original table but most of the annual emissions were incorrectly calculated based on 4380 hours per year of operation rather than the desired 8760 hours per year. The enclosed revised Table 3-1 corrects this error. Please accept our apology for any confusion this may have caused. All other portions of the application are already based on the revised Table 3-1 and need no further correction.

An additional question has come up regarding the modeling attached to the report. The modeling was conducted based on an emission rate assuming an oil with an 0.8 percent sulfur content. The actual proposed oil will have a maximum sulfur content of 0.30 percent. Reported results for SO<sub>2</sub> impacts were obtained by multiplying the modeled impacts by the ratio of .3/.8 or 0.375 (not the rounded 0.38 stated on pages 5-2 and A-2).

If you have any questions regarding this application, please call me at 913-339-2880 or Jim Crall of OUC at 305-423-9141.

Very truly yours,

BLACK & VEATCH



Steven M. Day

SMD:lar  
Enclosure

cc: W. H. Herrington  
T. D. Slepov  
J. S. Crall, w/2 copies of application and revised Table 3-1

Copied: Pradeep Raval ✓  
Wayne Aronson, EPA ✓  
Barry Andrews ✓  
Max Linn ✓  
File ✓  
Miguel Flores, NPS ✓



Rev

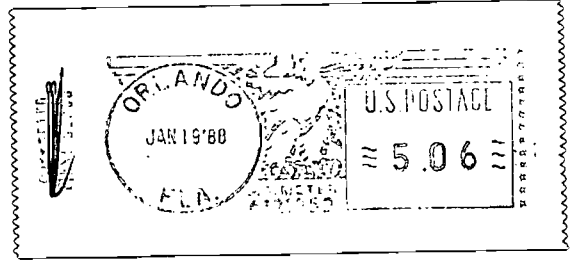
FROM  
**BLACK & VEATCH**  
ENGINEERS-ARCHITECTS

P.O. BOX 8405

KANSAS CITY, MO. 64114

---

Mr. C. H. Fancy, Deputy Chief  
Bureau of Air Quality  
Florida Dept of Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400



FROM

ORLANDO UTILITIES COMMISSION

P.O. BOX 3193

ORLANDO, FLORIDA 32802

Mr. C. H. Fancy, Deputy Chief  
Bureau of Air Quality  
Florida Department of  
Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, FL 32399-2400

DER  
JAN 20  
BAQM

Fold at line over top of envelope to the right  
of the return address

CERTIFIED

P 744 170 322

MAIL

Receipt Requested



Check Sheet

*Orlando Utilities Commission*  
150751-14448

Company Name:  
Permit Number:  
PSD Number:  
Permit Engineer:

ACDS-146749-146750  
PSD PL-130

Cross References:

- 
- 
- 

**Application:**

- Initial Application
- Incompleteness Letters
- Responses
- Waiver of Department Action
- Department Response
- Other

**Intent:**

- Intent to Issue
- Notice of Intent to Issue
- Technical Evaluation
- BACT or LAER Determination
- Unsigned Permit
- Correspondence with:

- EPA
- Park Services
- Other
- Proof of Publication
- Petitions - (Related to extensions, hearings, etc.)
- Waiver of Department Action
- Other

**Final**

**Determination:**

- Final Determination
- Signed Permit
- BACT or LAER Determination
- Other

**Post Permit Correspondence:**

- Extensions/Amendments/Modifications
- Other

In the folder labeled as follows there are documents, listed below, which were not reproduced in this electronic file. That folder can be found in one of the file drawers labeled Supplementary Documents Drawer. Folders in that drawer are arranged alphabetically, then by permit number.

**Folder Name:** Orlando Utilities Comission

**Permit(s) Numbered:**

AC	05	-	144482
AC	05	-	146749
AC	05	-	146750
AC	05	-	146751
PSD	FL	-	130

**Period during  
which document  
was received:**

**Detailed Description**

APPLICATION 20 JAN 1988	1.	APPENDIX SUMMARY OF APPLICABLE DISPERSION MODELING RUNS RECEIVED WITH APPLICATION
1989	2.	COMBUSTION TURBINE EMISSIONS TEST REPORT FOR ORLANDO UTILITIES COMMISSIONS INDIAN RIVER CTA PRODUCED 25/26 JULY, 1989