



## 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 Blainstone 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

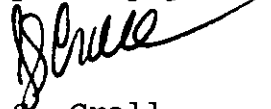
particulate emissions will still yield modeled ground level impacts below the significant impact level. Therefore, multisource modeling for particulate would still not be required.

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

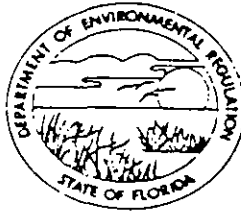
cc. P. Raval  
B. Andrews  
M. Linn  
W. Anderson, EPA  
C. Sheaver, NPS  
C. Collins, C. Day

} Raval  
9-7-89

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD  
JACKSONVILLE, FLORIDA 32207



BOB GRAHAM  
GOVERNOR

VICTORIA J. TSCHINKEL  
SECRETARY

G. DOUG DUTTON  
DISTRICT MANAGER

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 [X] Modification

COMPANY NAME: Orlando Utilities Commission COUNTY: Brevard

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

SOURCE LOCATION: Street Indian River Plant Titusville  
City (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: 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

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 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  
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