



PSD-FL-245

Farzie Shelton, chE; REM

Manager of Environmental Affairs - Energy Supply

October 23, 2000

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OCT 26 2000

BUREAU OF AIR REGULATION

Greg Worley, Chief
Pre-Construction/HAP Section
United States Environmental Protection Agency
Region 4
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-8909

**Re: Air Construction Permit, DEP File No. 1050004-004-AC (PSD-FL-245)
250 Megawatt Combustion Turbine - McIntosh Power Plant Unit No. 5**

Dear Mr. Worley:

As you are aware, Unit No. 5 is the first generation of Westinghouse 501G series Combustion Turbine that commenced initial operation on April 14, 1999. In accordance with the 40 CFR 60.8(a) as referenced in Specific Condition 29 of our permit, demonstration of compliance with the New Source Performance Standards (NSPS) and emission limits while burning Natural gas was conducted on March 2, 2000. However, this demonstration did not include tests while burning fuel oil as the unit had not commenced oil burning at that time.

On July 24, 2000 Siemens Westinghouse Power Corporation (SWPC), the manufacturer and supplier of the gas turbine 501G series, commenced firing fuel oil in this unit with the intention of demonstrating NSPS compliance tests after the initial shake down of equipment and tuning of the control system. Hence, on August 31, 2000 SWPC was able to synchronize the unit. However, due to multitude of problems (please see attached letter from SWPC addressed to Mr. Al Dodd) the operation of Unit No. 5 had to be stopped and presently the unit is none operational while SWPC is trying to remedy the problems.

As you will note from the attached document this unit operated a mere 13 hours at below 25% load (unit rated at 250 MW) utilizing 11000 MMBTU of fuel oil. Therefore, with the present circumstances SWPC does not believe they will be able to meet the requirement of our construction permit as specified in condition 29 as modified on December 9, 2000 which reads:

Compliance with allowable emission limiting standards shall be determined for applicable New Source Performance Standards in accordance with the most recent approved EPA schedule. Initial compliance with all other applicable emission limiting standards shall be determined concurrently with the

City of Lakeland ● Department of Electric

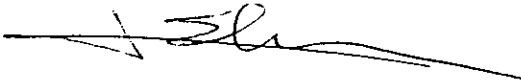
Greg Worley, Chief
Pre-Construction/HAP Section
United States Environmental Protection Agency

October 23, 2000
Page 2

demonstration of compliance with New Source Performance Standards with the exception that compliance with emissions limits applicable to fuel oil firing shall be determined not later than 90 days after the first oil firing that occurs after December 8, 1999. ...

Therefore, we are writing to request a 90-day window from the time Unit No. 5 is operational again and burning fuel oil to perform NSPS compliance testing while utilizing fuel oil. Your cooperation in this matter is greatly appreciated. As always, we look forward to working with you and your staff in finding a suitable solution to our request. If you should have questions, please do not hesitate to contact me.

Sincerely,



Farzie Shelton

Cc: Mr. C.H. Fancy, P.E. - DEP
Mr. Hamilton Owen P.E. - DEP
Mr. Al Linero P.E. - DEP
Mr. David McNeal - EPA

Attachment

City of Lakeland ● Department of Electric

October 19, 2000

Mr. Al Dodd
City of Lakeland, Florida
Department of Electric Utilities
501 East Lemon Street
Lakeland, Florida 33801-5069

W-COL-0371
File: 055.2

**Subject: City of Lakeland - McIntosh Unit #5 Project
Fuel Oil Emissions Compliance Request for Extension**

Dear Al:

Introduction

This letter is being sent to provide the City of Lakeland an update on the Liquid Fuel Commissioning Activities associated with the W501G Simple Cycle McIntosh 5 unit located at Lakeland, FL. As you know, this is the first W501G advanced turbine of its kind to be commissioned on oil fuel.

Siemens Westinghouse Power Corporation (SWPC) has been working diligently to commission the McIntosh 5 unit on oil fuel and conduct the compliance test within the 90-day period specified in the permit. Although it is very early in the fuel oil commissioning program, SWPC does not anticipate meeting this schedule requirement due to unanticipated mechanical issues that have occurred with the unit that still need to be resolved.

Initial Plan and Current Status:

The initial oil fuel plan was to complete the oil fuel commissioning process in nominally two weeks of operation with the following major milestones:

- Achieve Ignition and Synchronize
- Demonstrate reliable oil Operation Throughout the Load Range
- Tune for emissions and dynamics
- Successful completion of performance and Compliance Testing

To date, the W501 G has been able to demonstrate reliable ignition on oil and reliable operation up to 25% load. Operation above 25% load has been prevented due to difficulties with fueling the "B" Stage valve. Since the "B" stage valving issues arose, other mechanical issues, outlined below, have prevented further operation. The unit has now operated on fuel oil for nominally 13 hours (see attachment).

Mechanical Issues:

The oil fuel commissioning process has identified several mechanical issues that have impeded completion of our plan. These issues, as addressed below, have required redesigns, corrective

Siemens Westinghouse Power Corporation
A Siemens Company

4400 Alafaya Trail
Orlando, FL 32826-2399

Mr. Al Dodd
10/19/00

actions and field-testing. The cumulative result of these issues has severely limited the availability of the unit for the purpose of fuel oil testing. These issues require resolution prior to proceeding with additional oil fuel commissioning.

1. Ignition - Problems with ignition were the first to develop. Initial challenges included changing the ignition system to a higher energy spark source, changes to the design of the igniters and eliminating high temperature ignition lead failures. These actions, combined with extensive ignition mapping efforts, have now resulted in reliable operation up to 25 % load, where the final ("B") Stage fuel valve must be initiated. This is the challenge we are currently solving.
2. Fuel Stages – There are three stages of fuel oil injection required to progress through the unit operating range. The stages are defined as "pilot", "A" and "B". Ignition and operations at low loads has been proven and are accomplished while using the "pilot" and "A" stage. The higher load level operations that require the "B" stage have yet to be completed. The "B" stage valve and control logic is being changed to improve operation to permit successful. Initiation of combustion in the "B" stage.
3. Miscellaneous Mechanical Components – Various other oil fuel system components have required repair/replacement. An example is the multi-function valve station that is used to switch between fuel oil injection and purge operations. This component required refurbishment at the supplier's facility. The unit was unavailable for oil fuel operation for the duration of the repair.
4. Generator - The final major impediment to the oil fuel commissioning is unrelated to the oil fuel system. During commissioning activities, a problem with the generator was discovered, specifically, high vibration. The vibration characteristics of the generator rotor have prevented continuous operation in high load ranges ("B" stage required), which would prevent necessary tuning activities required prior to performing the state required performance test. A generator repair outage has been scheduled to coincide with the availability of the necessary repair components.

Regulatory Relief Request:

SWPC proposes that the City of Lakeland request from the FDEP and EPA an additional 90 days from the date the unit is again synchronized operating on fuel oil to perform the emissions compliance test. Although significant progress has been made in commissioning the fuel oil system in ignition and low load operation, important hurdles still remain in commissioning and tuning the system in preparation for the emissions compliance test. Mechanical issues have limited fuel oil operation to nominally 13 hours, and more operating time is required. While the 90-day clock has been started, due to these mechanical issues, SWPC has not been able to realize the full benefit of

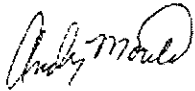
SIEMENS
Westinghouse

Mr. Al Dodd
10/19/00

this time to complete commissioning activities. SWPC will support the City with technical support in this effort, as required.

Please call me with any questions regarding this and the upcoming commissioning activities.

Regards,



Andy Mould
Project Manager

AM/Is

Attachment

cc:	Tim Bachand	COL
	Roger Greenwood	SWPC
	Gerry Myers	SWPC
	Pete DeRosa	SWPC
	Ramesh Kagolanu	SWPC
	Jason Kraus	SWPC

Lakeland 501G Fuel Oil Statistics

Build 8 Fuel Oil Statistics

- Total Start Attempts - 73
- Successful Starts - 29
- Total Fired Hours - 12.51
- Days of Oil Operation - 16
- First Fire Date - 7/24/00
- First Sync Date - 8/31/00
- Last Fire Date - 9/12/00
- mmBTU's Burned (HHV) ~ 11000

Lakeland 501G Daily Statistics Summary - Oil

Build	Date	Start Attempts (Oil)	Successful Starts (Oil)	Fired Hours	Hours Above 70% Load
Build 8	7/24/00	6	0	0	0
	7/25/00	3	0	0	0
	8/5/00	3	0	0	0
	8/6/00	4	0	0	0
	8/13/00	9	0	0	0
	8/15/00	3	0	0	0
	8/17/00	3	2	0.13	0
	8/18/00	3	1	0.08	0
	8/19/00	4	2	0.17	0
	8/20/00	8	3	0.5	0
	8/25/00	6	0	0	0
	8/26/00	4	4	0.9	0
	8/27/00	6	6	1.02	0
	8/31/00	3	3	2.95	0
	9/1/00	5	5	2.13	0
	9/12/00	3	3	4.63	0
Totals		73	29	12.51	0



Farzie Shelton, chE; REM

Environmental Affairs Manager of Licensing & Permitting

February 22, 1999

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FEB 23 1999

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Mr. Greg Worley
Chief
Pre-Construction/HAP Section
United States Environmental Protection Agency
Region 4
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-8909

**Re: Air Construction Permit, DEP File No. 1050004-004-AC (PSD-FL-245)
250 Megawatt Combustion Turbine - McIntosh Power Plant Unit No. 5**

Dear Mr. Worley:

As you are aware, Unit No. 5 is the first generation of Westinghouse 501G series Combustion Turbine and due to its large size has not been factory tested prior to its installation on site of McIntosh Power Plant. Hence, special test program has been developed to validate the unit's design in the field. The overall test program includes mapping and tuning of fuel combustors design, followed by the disassembly of the engine to remove the test instruments and inspection of the engine hardware. Finally the engine is reassembled in preparation of compliance testing and commercial operation.

The test period is planned to cover a period of approximately thirteen weeks from an expected first fire date. The test program planned for this unit is critical for the evaluation of the integrity and long-term operability of the unit. The test program includes various phases beginning with the loading of the combustion turbine to full operating conditions in programmed steps with as few operating hours and starts as possible. Operating the combustion turbine at maximum load and temperatures early in the program is critical due to the limited life of the instrumentation that is used to collect the data. For the proper evaluation of the integrity of the unit, the data must be based on operation of the engine under the most extreme conditions. The primary focus of this testing period is the critical temperature data. However, vibration frequencies, blade clearances, stress and strain, thermal and aerodynamic data are also recorded. The combustion system will be tuned for maximum stability for this testing period. The 501G engine will be instrumented with over 2000 data points for the validation testing effort. This testing program is governed by a strategy to obtain the highest priority or most critical data early in the test plan when the highest percentage of the test instrumentation is full functional. The test period will include extensive validation testing on the engine, its auxiliaries, single and dual fuel combustors, a combustor changeout, an engine outage to disassemble and reassemble the engine, as well as the normal production unit commissioning activities.

City of Lakeland ● Department of Electric

February 22, 1999

Mr. Greg Worley
Chief
Pre-Construction/HAP Section
United States Environmental Protection Agency
Region 4

We are cognizance of the 40 CFR 60.8(a) requirements, demonstration of compliance with the New Source Performance Standards (NSPS) as referenced in specific condition 29 of our permit. However, based on the above test program and due to an extenuating circumstances beyond our control, we are writing to request an extension of time beyond the 60 days allowed after achieving the maximum production rate to demonstrate compliance. In a telephone discussion with Mr. David McNeal he stated that the Agency will consider an extension of time, a 30 day time window from the last reassembly of the unit but no later than 180 days of initial operation of the unit, to perform the NSPS compliance test. Therefore, we are writing to request this extension.

We appreciate the Agency's consideration to our request and wait to hear from you soon. However, if you should have any questions, please do not hesitate to contact me.

Sincerely



Farzie Shelton

Cc: Mr. C.H. Fancy, P.E.
Chief Bureau of Air Regulation
Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road, Mail Station #5505
Tallahassee, Florida 32399-2400

Mr. Hamilton Oven P.E.
Administrator
Siting Coordination Office
Florida Department of Environmental Protection
2600 Blair Stone Rd
MS-48
Tallahassee, Fl 32399-2400

cc: J. Devon, BAR

City of Lakeland ● Department of Electric



Farzie Shelton, chE; REM

Environmental Affairs Manager of Licensing & Permitting

AC

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

January 14, 2000

Mr. C.H. Fancy, P.E.
Chief Bureau of Air Regulation
Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road, Mail Station #5505
Tallahassee, Florida 32399-2400

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JAN 21 2000

BUREAU OF AIR REGULATION

Re: Air Construction Permit No. 1050004-006-AC (PSD-FL-245 -A) Lakeland Electric Unit No. 5

Dear Mr. Fancy:

In compliance with the above referenced permit (Section III. Emission Unit Specific Condition 29) and 40CFR 60.7 and 60.8, we are writing to notify the Department of our intention to perform the initial stack testing commencing on January 14, 2000. Accordingly, we intend to demonstrate compliance with the NSPS and BACT Standards while burning Natural Gas. However, at this time we do not intend to demonstrate compliance while burning low sulfur fuel oil as, to date, we have not used any fuel oil during start up of this unit. Please note that we restarted this unit on January 7, 2000 following redesign and reassemble of some combustion components. We have informed DEP Southwest District by telephone of this event, however, we will provide a copy of this letter to Mr. Bill Thomas of DEP's Southwest District and Mr. Greg Worley of the Environmental Protection Agency.

If you should have any questions, please do not hesitate to contact me.

Sincerely

Farzie Shelton

Cc: Mr. William C. Thomas P.E.
Administrator
Department of Environmental Protection
3804 Coconut Palm Drive
Tampa Fl 33619

Mr. Greg Worley
Chief
Pre-Construction/HAP Section
United States Environmental Protection Agency
Region 4
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-8909

City of Lakeland ● Department of Electric

*Teresa - F.Y.I.
file*

*City of
Lakeland*

PSD-FI-245

MEMORANDUM

TO: MAYOR AND CITY COMMISSION
FROM: CITY ATTORNEY'S OFFICE
DATE: September 8, 1998
RE: Task Authorization with Black and Veatch

Attached hereto is a proposed Task Authorization 98-07 with Black and Veatch Engineers to provide support during the need certification process required by the Power Plant Siting Act for the combined cycle conversion of McIntosh Unit #5.

The Public Service Commission conducts an involved review and public hearing process to determine a need for most types of additional generation. This involves multiple filings and testimony by experts as to the available generation within the state and how the proposed unit will effect the overall state system. Black and Veatch is experienced in this process and the staff recommends hiring them as a consultant. The not-to-exceed fee is \$334,510.

This Task Authorization is pursuant to our existing continuing contract with Black and Veatch and it is recommended that the appropriate City officials have authorization for its execution.

TJM/cs

attachment



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Manager of Environmental Licensing & Permitting

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

July 13, 1998

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JUL 16 1998

BUREAU OF
AIR REGULATION

Mr. C.H. Fancy, P.E.
Chief Bureau of Air Regulation
Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road, Mail Station #5505
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

**Re: Air Construction Permit No. PSD-FL-245 - Lakeland Electric & Water Unit No. 5
Construction Commencement Notification**

In compliance with the 40 CFR Part 60 § 60.7 we are writing to notify you of our intention to commence construction of the above referenced unit on Monday July 13, 1998. We would be forwarding a copy of this communication to Mr. Hamilton S. Oven (Administrator, Siting Coordination Office), and Mr. William C. Thomas (Administrator Division of Air - Southwest District).

If you should have any questions, please do not hesitate to contact me at (941) 499-6603; by Fax at (941) 603-6335; or by E-Mail at fshel@city.lakeland.net.

Sincerely

Farzie Shelton

cc: Mr. Hamilton Oven P.E.
Administrator
Siting Coordination Office
Florida Department of Environmental Protection
2600 Blair Stone Rd
MS-48
Tallahassee Fl 32399-2400

cc: Jeresa Nelson, BAR

Mr. William C. Thomas P.E.
Administrator
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3804 Coconut Palm Drive
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