

Memorandum

Florida Department of Environmental Protection

TO: Michael G. Cooke

THRU: *for* Trina Vielhauer *JKP*
J. K. Pennington *JKP*

FROM: Michael P. Halpin *MPH*

DATE: December 7, 2004

SUBJECT: Cedar Bay Generating Co., L.P.
TDF Test Burn
DEP File No. 0310337-008-AC, PA 88-24

Attached is the final air construction permit for Cedar Bay Cogeneration Facility. This is an existing coal-fired facility which has three fluidized bed boilers (CFB's), feeding steam to one steam turbine.

The applicant has requested permission to fire a blend of up to 5% tire derived fuel (TDF) for 30 full power burn days, or 60 calendar days, whichever comes first. Based upon the submitted information and other readily available documentation, I believe that this type of boiler (a CFB) is well-suited to combusting such a fuel. Additionally, it is expected that the only potential increase in emissions would be that of SO₂, potentially causing an increase of less than 3 tons for the test duration.

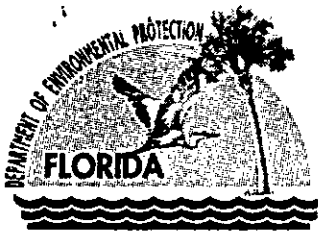
According to the Scrap Tire Management Council, the standard assumption is that waste (also known as scrap) tires are generated at a rate of one tire per person per year. Given the magnitude of this nationwide issue, it does not seem unreasonable to allow a well-designed facility such as Cedar Bay to test scrap tires as a fuel for heat recovery and electrical generation.

Notice was published in the Florida Times-Union on November 22, 2004. No comments were received.

I recommend your approval.

Attachments

/mph



Jeb Bush
Governor

Department of Environmental Protection

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

Colleen M. Castille
Secretary

December 7, 2004

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Martin Kreft
General Manager
Cedar Bay Generating Co., L.P.
9640 Eastport Road
Jacksonville, Florida 32218

File No. 0310337-008-AC, PA 88-24
SIC No. 4911
Expires: April 1, 2005

Re: Cedar Bay Cogeneration Facility
TDF Test Burn
AIRS ID No. 0310337-008-AC, PSD-FL-137 and PA 88-24

Dear Mr. Kreft:

The Department has reviewed the request from Cedar Bay Generating Co., L.P. received on October 25, 2004 concerning the burning of a 5% blend of tire derived fuel (TDF) in your cogeneration facility (Boiler C) located in Duval County, Florida.

You are hereby authorized to conduct performance tests on one boiler ("C") at this (Cedar Bay Cogeneration) facility while burning a blend of up to 5 percent TDF (by weight) with coal, or an equivalent of approximately 5 tons per hour at full load. The testing period shall not exceed 30 full power burn days and shall conclude within 60 days from the first day TDF is burned in the boiler. A full power burn day is defined as operation for 24 hours at full load. Test results must include a material balance (fuels, emissions, bottom ash, and fly ash) of the metals in the fuels. All conditions of existing permits related to air pollution emission limits and control equipment remain in force during the test burn.

A performance test shall be conducted during the testing period in order to gather data regarding air pollutant emissions, any operation limitations on burning a blend of up to 5 percent by weight TDF in the boiler, and to determine the metal content in the bottom (bed) and fly ash. The test results as well as an engineering analysis identifying any changes required to the facility in order to sustain continued TDF firing on a permanent basis shall be sent to the Department's Bureau of Air Regulation within 60 days of completion of the tests.

The performance test shall be subject to the following conditions:

1. The permittee shall notify the Duval County Environmental Resource Management Department Environmental Quality Division, the DEP Northeast District, and the Bureau of Air Regulation at least one day prior to burning TDF and 15 days prior to commencement of the performance test. A written test report shall be submitted to these offices within 60 days of completion of the last test run. Notification shall also occur within 5 days, in writing, upon completion of the final test.
2. The maximum feed rate of TDF to the "C" boiler at the Cedar Bay Cogeneration facility shall not exceed 5 tons per hour or 5 percent by weight of the total feed rate, whichever is less.

"More Protection, Less Process"

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3. The testing series shall include emissions tests for the maximum TDF blend (up to 5 percent) with the boiler operating at permitted capacity. Permitted capacity is defined as 90-100 percent of the capacity allowed by Permit No. PSD-FL-137 (and subsequent revisions). Testing shall be conducted in accordance with the test plan, and incorporated as Attachment "A".
4. Stack emissions related to TDF co-firing shall not exceed any limit within existing permits.
5. Emissions tests shall be conducted and results reported for PM, PM10, Pb, Hg, Be, VOC's and sulfuric acid mist using test methods defined in Specific Condition A.34. of the facility's Title V permit. CEMS data shall be recorded and analyzed for sulfur dioxide, nitrogen oxides, opacity and heat input.
6. Based on the data collected during the test burn, estimate the potential emissions that will occur if the maximum amount of TDF requested is burned in the facility on a permanent basis. For rule applicability determination, calculate any change in emissions (lbs/hr and TPY) for all air pollutants that would result from the firing of a blend of TDF compared with presently permitted scenarios.
7. To provide reasonable assurance that this fuel blend can be burned in compliance with the air regulations, as-burned fuel samples (coal and TDF), bottom ash, and fly ash shall be collected and analyzed for total metals content (selenium, silver, chromium, copper, arsenic, cadmium, zinc, mercury, lead, and beryllium) throughout the test burn of the blended fuel. Weekly composite of daily samples shall be required as well as analyses of a composite sample collected during the particulate matter tests. A one-time, individual sample of each fuel (TDF and coal) shall be required to be analyzed prior to beginning the test burn, in order to ensure the validity of the composite sample.

To provide reasonable assurance that the ash generated from this fuel blend can be disposed of in compliance with the solid and hazardous waste regulations, representative samples of the fly and bottom ash generated as the result of burning coal and TDF shall be sampled and analyzed in accordance with the requirements set forth in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846", Method 3050. The constituents within the metals shall also be analyzed using the Toxic Characteristic Leaching Procedure (TCLP, Method 1311 of SW-846).

- a) A minimum of two composite samples each of fly and bottom ash shall be collected and analyzed at the beginning of the sampling event for organic constituents listed in 40 CFR 261.24 Table 1 using SW-846 test method 1311 (TCLP). If organic constituents are present, then the remainder of the composite samples collected shall be analyzed for organic constituents listed in 40 CFR 261.24 Table 1 using SW-846 test method 1311 (TCLP).
- b) Representative samples shall account for variability in both the fly and bottom ash. The US EPA's protocol entitled "Guidance For Sampling and Analysis of Municipal Waste Combustion Ash For the Toxicity Characteristic" shall be used as guidance for collecting, handling, storing and analyzing a representative sample.
- c) Representative composite samples of fly and bottom ash shall be analyzed for arsenic, beryllium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc using SW-846 test method 1311 (TCLP) and 3050 (total metals digestion).
- d) Daily composite samples of the blended fuel, coal mixed with TDF, shall be collected during the ash sampling period and analyzed for arsenic, beryllium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc using SW-846 test method 3050. The blended fuel mixture, coal and TDF, samples shall be blended and reduced in size to pass through a #60 mesh screen prior to analysis of specific chemicals.

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8. A material balance of the metals in the fuel, emissions, bottom ash and fly ash shall be performed and reported based on all test/analytical data.
9. Any performance tests shall be conducted using EPA Reference Methods, as contained in 40 CFR 60 (Standards of Performance for New Stationary Sources), 40 CFR 61 (National Emission Standards for Hazardous Air Pollutants), and 40 CFR 266, Appendix IX (Multi-metals), or any other method approved by the Department, in writing, in accordance with Chapter 62-297, F.A.C.
10. Daily records (i.e., mass feed rates of each fuel, heat input, steam production, pressure, temperature, MW, fuel input rates, etc.) of the boiler operations when firing the TDF blend during the tests shall be maintained.
11. The authorized TDF performance test shall not result in the release of objectionable odors pursuant to Rule 62-296.320(2), F.A.C.
12. Performance testing shall cease as soon as possible if the test boiler operations are not in accordance with the conditions within existing permits, or this authorization protocol. Performance testing shall not resume until appropriate measures to correct the problem(s) have been implemented.
13. This Department action is only to authorize the TDF blend performance test. Any firing of tire derived fuel beyond the 30 full-power burn days (or 60 calendar days) of testing approved to conduct such tests will be deemed a violation of permit No. PSD-FL-137.
14. Unless otherwise specified herein, the test protocol submitted by the applicant, and received by FDEP on October 25, 2004, including the sampling and analysis methods of fuel and ash, is acceptable and incorporated herein as Attachment "A".

This letter must be attached to permit No. PSD-FL-137 and shall become a part of the permit.

Sincerely,



Michael G. Cooke, Director
Division of Air Resource
Management

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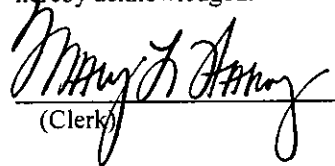
CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Intent to Issue Air Construction Permit (including the Public Notice of Intent to Issue Air Construction Permit and the Draft Air Construction Permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 12/9/04 to the person(s) listed:

Martin Kreft, Cedar Bay *
Jeff Walker, Cedar Bay
Gregg Worley, EPA
John Bunyak, NPS
Chris Kirts, NED
Steve Pace, Duval County ERMD
Ken Kosky, Golder
Hamilton S. Oven, DEP-Siting

Clerk Stamp

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


(Clerk)

12/9/04
(Date)

CEDAR BAY COGENERATING PLANT TIRE DERIVED FUEL TEST BURN PROTOCOL

PURPOSE

Cedar Bay's Circulating Fluidized Bed boilers represent one of the newer systems designed to minimize environmental impact from use of a variety of solid fuels, including Tire-Derived Fuel (TDF). High turbulence and uniform heat distribution allow fluidized beds to operate at lower temperatures to minimize NO_x formation. Ammonium Hydroxide is also used to supplement NO_x reduction. Limestone is used as the circulating bed media providing efficient Sox control through integral mixing with combustion gases. Baghouses provide efficient particulate removal.

Cedar Bay proposes to perform a performance test burn of tire-derived fuel in one boiler (Boiler C) in order to evaluate its use as a supplemental fuel. The 30-day test burn of tire-derived fuel is designed to ascertain whether the circulating fluidized bed boiler can burn the TDF as supplemental fuel without exceeding permitted limitations on emissions, fuel usage or other environmental conditions and without causing any operational conditions which would affect reliable operation. This plan is intended to be used for submission to FDEP and RESD and as a guide for the plant to complete the performance test burn.

TDF DESCRIPTION

Tire-Derived Fuel (TDF) refers to the use of processed scrap tires as a substitute for fossil fuel. TDF is a hydrocarbon-based material derived from oil and gas. The TDF has a heat content in the range of 14,000 – 15,500 Btu/pound as compared to Cedar Bay's coal heat content of 11,500 – 12,500 Btu/pound. With a lower moisture content than coal, there is a higher energy utilization efficiency and TDF's higher volatile-to-fixed carbon ratio provides rapid and complete combustion.

TDF COMBUSTION PROCESS & EQUIPMENT

The TDF will be delivered to Cedar Bay in trucks. The TDF will be stored in the existing limestone storage area. Cedar Bay will utilize a temporary conveyor equipped with a dedicated hopper and metering device to feed the TDF on a conveyor after the coal crusher to enable the feed of the desired ratio of TDF to coal in Boiler C's coal silos.

The TDF metering unit is approximately 20' long, 8' wide and 11' high. The metering bin has sloped sides that angle down, with two screw augers in the bottom of the unit that are variable speed controlled. The system is designed to discharge onto a belt transfer conveyor. The system instrumentation is in a waterproof enclosure that will enable the plant to interlock the unit with the existing fuel handling system.

The TDF will provide less than 5% of the heat input to C boiler when the TDF feed rate is 5 tons/hr and the boiler is at full load.

SCOPE OF TEST BURN

Operational Feasibility: In order to confirm that co-firing of TDF is feasible without adverse impact to operations the following will be monitored using the dedicated operational performance monitoring software:

- Boiler Operations – facility personnel will monitor boiler performance during the 30-day test burn to determine the impact of TDF combustion on performance and operations. Key parameters that will be continuously monitored are as follows:
 1. Coal flow (KLBS/HR)
 2. Coal Master Demand (%)
 3. Main Steam Flow (KLBS/HR)
 4. Main Steam Temperature (DEG F)
 5. Main Steam Pressure (PSIG)
 6. Reheat Flow (KLBS/HR)
 7. Reheat Temperature (DEG F)
 8. Reheat Pressure (PSIG)
 9. Reheat Attenuator Water Flow (KLBS/HR)
 10. Primary Air Grid Nozzle Flow (KLBS/HR)
 11. Primary Air Temperature (DEG F)
 12. Secondary Air Flow (KLBS/HR)
 13. Secondary Temperature (DEG F)
 14. Bed Temperature (DEG F)
 15. Cyclone Outlet Temperature (DEG F)
 16. Combustor Lower Temperature (DEG F)
 17. Combustor Middle Temperature (DEG F)
 18. Combustor Upper Temperature (DEG F)
 19. ReheatII Outlet Gas Temperature (DEG F)
 20. Economizer Inlet Gas Temperature (DEG F)
 21. Economizer Outlet Gas Temperature (DEG F)
 22. Primary Air Air Heater Cold End Temperature (DEG F)
 23. Secondary Air Air Heater Cold End Temperature (DEG F)
- Ash Handling/Air Pollution Control Equipment – facility personnel will monitor the performance of the ash transport system and emission control equipment to ensure proper operation. Parameters that will be continuously monitored:
 1. Baghouse DP “Average” (PSIG)
 2. Baghouse Inlet Temperature (DEG F)
 3. Opacity (%)
 4. Ammonia Flow (ACFM)

Environmental Compliance: facility personnel will monitor the applicable parameters during the test burn to ensure compliance with all permit conditions:

- The amount of TDF burned will be monitored and recorded
- CEM Monitoring – the CEM system will be used throughout the 30-day test period to confirm compliance with CO, NO_x, SO_x, Opacity and heat input limitations.
- Limestone Flow (KLBS/HR)
- Stack Testing for Particulate Matter, Particulate Matter less than 10 microns, Lead, Mercury, and Beryllium, Sulfuric Acid Mist and Volatile Organics will be completed during the 30-day test burn to confirm compliance with these limitations. The tests will be conducted by a qualified test firm.

The following test methods and procedures will be used during the test burn:

Purpose / Substance	Test Method
Selection of sample site and sample traverse	EPA Method 1
Determination of stack gas flow	EPA Method 2
Gas analysis for calculation of percent O ₂ and CO ₂	EPA Method 3 or 3A
Determining stack gas moisture content to convert the flow rate from actual standard cubic feet (ascf) to dry standard cubic feet (dscf)	EPA Method 4
PM	EPA Method 5, 17, or 29
PM ₁₀	EPA Method 201 or 201A
VE	EPA Method 9
Pb	EPA Method 12 or 29
Hg	EPA Method 101A or 29
Be	EPA Method 104 or 29
Sulfuric Acid Mist	EPA Method 8
VOCs	EPA Method 18 or 25

TESTING PROCEDURE

The plant should be operating in a steady state while maintaining as close to the following parameters as possible:

Main steam temp 1000 deg F +/- 10 deg F
 Reheat steam temp 1000 deg F +/- 10 deg F
 Main steam pressure 2410 +/- 100 psia
 Boiler Blowdown in normal operation
 Condenser level in auto
 Deaerator level in auto
 Steam drum level in auto
 Plant in stable condition (no plugged fuel feeders etc) with no major maintenance occurring
 Bottom ash screw coolers in steady state operation.

The outside emission testing company should have their equipment in place and ready to collect data from the exit ductwork on Boiler C.

At the point the silo level reaches 0% indication on the DCS or the fuel level reaches the pant leg of the silo the blended test fuel can be fed to the fuel silo. Past experience indicates that it will take about 3 hours for the test burn material to reach the boiler.

Normal automatic operations should be maintained. Boiler operation will be at steady state full load operation at least one hour prior to commencing stack test achieving a minimum 704 Klbs/hr steam flow and 956.7 lbs/mmBtu heat input during emission testing.

Fuel Sampling and Analytical Methodology

One (1) as-fired fuel sample (blend of coal and TDF) will be collected each day from the coal conveyor belt prior to bunkering into the silo and composited into a weekly sample for analysis. This sampling schedule will be followed throughout the blended test burn period. The weekly composite sample will be analyzed for the constituents listed in the following "Metals Table" below.

Metals Table

Fuel samples will be analyzed using the SW-846 Method 3050 (Metals Digestion Procedure).

A. Arsenic	Method 7060	F. Lead	Method 7421
B. Beryllium	Method 6010	G. Mercury	Method 7471
C. Cadmium	Method 6010	H. Selenium	Method 7740
D. Chromium	Method 6010	I. Silver	Method 6010.
E. Copper	Method 6010	J. Zinc	Method 6010

Daily TDF/coal samples will be collected for proximate analyses. (% moisture, % ash, % volatile, % fixed carbon, % sulfur and BTU/lb determination)

Ash Sampling and Analytical Methodology

Ash sample collection should be conducted in conjunction with the fuel samples for metals analysis. Flyash will be collected below the bottom dump gates of the flyash separator while the bottom ash will be off the sample port on the drag chain.

One (1) sample of fly ash and one (1) sample of bed ash will be collected each day at the sample points and composited into weekly bed and fly ash samples for analysis. The weekly composite sample will be analyzed for the constituents listed in the "Metals Table" below.

Metals Table

Fuel samples will be analyzed using the SW-846 Method 3050 (Metals Digestion Procedure).

F. Arsenic	Method 7060	F. Lead	Method 7421
G. Beryllium	Method 6010	G. Mercury	Method 7471
H. Cadmium	Method 6010	H. Selenium	Method 7740
I. Chromium	Method 6010	I. Silver	Method 6010.
J. Copper	Method 6010	J. Zinc	Method 6010

The constituents in the "Metals Table" will be also analyzed using the Toxic Characteristic Leaching Procedure (TCLP, Method 1311 of SW-846).

DATA COLLECTION

The plant data collection system has been programmed to collect pertinent data points.

CALCULATIONS AND REPORT

To be provided at the conclusion of the test burn

SENDER: COMPLETE

SECTION 1

ON DELIVERY

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Martin Kreft
General Manager
Cedar Bay Generating Co., L.P.
9640 Eastport Road
Jacksonville, Florida 32218

A. Signature

X

☐ Agent☐ Addressee

B. Received by (Printed Name)

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes

If YES, enter delivery address below:

☐ No

3. Service Type

☒ Certified Mail☐ Express Mail☐ Registered☐ Return Receipt for Merchandise☐ Insured Mail☐ C.O.D.

4. Restricted Delivery? (Extra Fee)

☐ Yes

2. Article Number

(Transfer from service label)

7000 1670 0013 3110 2004

PS Form 3811, Aug

Domestic Return Receipt

102595-02-M-1540

U.S. Postal Service

CERTIFIED MAIL RECEIPT

(Domestic Mail Only; No Insurance Coverage Provided)

4002 0TTE ET00 029T 0002

Postage	\$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	\$

Postmark
Here

Sent to
Mr. Martin Kreft
General Manager
Cedar Bay Generating Co., L.P.
9640 Eastport Road
Jacksonville, Florida 32218

PS Form 3800, May 2000

See Reverse for Instructions