State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee

To: _____ Location: _____

To: _____ Location: _____

To: _____ Location: _____

From: _____ Date: _____

Interoffice Memorandum

OK
BPhenn

TO: Mirza Baig

FROM: Syed Arif SA

DATE: August 12, 1991

SUBJ: South Broward Resource Recovery Facility

This memo is in response to the proposal by Wheelabrator South Broward, Inc., to use a high velocity thermocouple (HVT) in correlating the furnace gas temperature to the gas temperature leaving the superheater.

The proposal would be acceptable if the initial correlation is done on all three boiler trains, and a same or different correlation factor is developed for all three trains. In addition, an annual HVT testing should be required on one of the three trains with the most operating hours.

If additional information is needed, please contact me.

/cjh

cc: Jim Pennington
Buck Oven

DEPARTMENT OF ENVIRONMENTAL RE

ROUTING AND TRANSMITTAL SLIP

1. TO: (NAME, OFFICE, LOCATION)
Mirza Baig
2.
3.
4.

REMARKS:

The HVT method would be acceptable if the initial correlation is done on all three boiler trains and then annually on one of the three trains with the most operating hours.

FROM:
Syed Arif

DATE 8/12

PHONE

Department of Environmental Regulation

Routing and Transmittal Slip

To: (Name, Office, Location)

1. JIM PENNINGTON, P.E. ADM.
2.
3.
4.

Remarks:

Please have someone from your staff review the surrogate (HVT) method and advise the permitting section if this proposal is acceptable.

Thanks,

Mirza

From:

Date 8-6-91.

Phone

Department of Environmental Regulation

Routing and Transmittal Slip

To: (Name, Office, Location)

1. Barry Andrews
2.
3.
4.

Remarks:

Please review and give comments

Procedure

Check into this and report to Buck.

Barry

From: BUCK OWEN

Date: 7/1

Phone:

WHEELABRATOR SOUTH BROWARD INC.

4400 S. State Road 7
Ft. Lauderdale, FL 33314
305-581-6606 - Tel.
305-581-6705 - Fax

June 13, 1991

Hamilton S. Oven, Jr., P.E.
Florida Department of Environmental Regulations
1900 South Congress Avenue, Suite A
West Palm Beach, FL 33406

Re: South Broward Resource Recovery Facility
Furnace Temperature Measurement

Dear Mr. Oven:

Attached is the proposal to use a high velocity thermocouple (HVT) as a surrogate for the revised requirement addressed in Section Condition XIV.A.3.a of the Final Order Modifying Conditions of Certification. The procedure describes in detail the HVT methodology and how it would be used to continuously monitor the combustion chamber, as we discussed by teleconference with Thomas Kirk.

This technique is used currently by several of our facilities. It is necessary as a practical matter, because the superheater outlet thermocouple is the only one available inside the furnace for temperature management. Because of the identical equipment design of all three (3) boiler trains, the correlation factor is used for the facility after it is derived from this test.

Should you have any questions after reading this procedure, please contact this office. We trust you will concur with this technique and may so indicate by acknowledging below.

Very truly yours,

J.R. Wiegner
Project Manager

776.JRW/ms

Attachment

cc: T. Henderson
B. R. Dunn
T. Kirk
C. Faller

_____
Hamilton S. Oven, Jr.

_____
Date

PROPOSAL FOR FURNACE TEMPERATURE MEASUREMENT

Introduction:

The Babcock & Wilcox Company submits this test proposal for an HVT (High Velocity Thermocouple) traverse to obtain furnace gas temperature measurements. These traverses will be carried out through burner spud openings on Unit No. 3 at Wheelabrator Environmental System's Broward North Station (B&W Contract SW-1023).

The objectives of this test program are to confirm that the furnace gas temperature is at least 1800°F and to correlate the furnace gas temperature as measured by HVT traverses to the gas temperature leaving the superheater as recorded by WESI's permanent TC.

Scope:

Babcock & Wilcox proposes the following scope of work in this test program:

1) Furnace gas temperature measurement by HVT traverses at the burner elevation.

2) Simultaneously monitor gas temperature leaving the superheater as indicated by the plant permanent thermocouple via plant computer.

Furnace Gas Temperature Measurement:

The temperature of the furnace combustion gases will be measured with water-cooled HVT probes inserted through the burner gas spud openings at elevation 52'-5". A sketch showing the port location of HVT traverses is attached with this proposal (see Sketch SK-MJM021191).

A source of compressed air supply (80 to 100 psi and 20 CFM) is required to operate each air aspirator to induce a gas flow equivalent to 15,000 lb per sq. ft.-hr across the thermocouple junction and a source of cooling water supply (80 to 100 psi) is required to maintain a flow rate of 30 to 35 gpm through each probe.

Combustion gas temperatures will be measured at 2 Ft. intervals by traversing the furnace width at the burner elevation. HVT probes are designed to limit the radiation effect on the thermocouple. Data will be taken during probe insertion and retraction to insure repeatability and representative readings. Each temperature reading will then be converted to MHVT (Multiple High Velocity Thermocouple) to account for any radiation of the hot thermocouple tip to cooler surface.

Pre-Test Preparations:

Plant Inspection: One B&W Result Engineer will visit the job site for a day prior to the test to collect the required information before the HVT probes are fabricated. It is most essential that the selected locations for HVT traverse are accessible and in working order.

The client will be responsible for providing 100% air shut off to the burners while traverses are in progress. A blank damper arrangement is suggested in the common air supply duct.

Equipment Preparation:

Prior to the test, all test equipment consisting of HVT probes and required accessories, to be supplied by B&W will be inspected. Gas path sampling equipment will be pressure checked for leakage. Potentiometers will be calibrated using a milivolt potentiometer traceable to the National Bureau of Standards. HVT flow orifices will be calibrated using a flow orifice reference that is traceable to the National Bureau of Standards. HVT sheathed couples will meet ANSI standard tolerances.

Test:

Temperature Measurement:

Furnace gas temperature at the burner elevation will be measured at three different load conditions using water-cooled HVT thermocouple probes. The temperature shall be measured at each two foot intervals along the HVT traverse, during the insert and retract motion in a horizontal plane. HVT traverses will be performed by two 22 Ft. long probes. These traverses will be performed at two burner locations and two boiler sidewalls. The HVT traverses will be performed simultaneously through both sidewalls at each burner location.

Load Conditions:

1. 185,000 lbs/hr steam flow

2. 170,000 lbs/hr steam flow

3. 150,000 lbs/hr stream flow

The boiler will be in automatic control at normal operating conditions for each load.

Test Schedule:

The test schedule requires three (3) days for testing, two (2) days for travel and two (2) days for set-up and teardown. Schedule is based on a total of two (2) B&W personnel. The test selling price is based on using the assistance of four (4) plant personnel to set-up equipment and maneuver the HVT probes.

Test Report:

A Test report will be presented within two weeks after test completion. This report will include a summary of test observations, test methods and complete details of the test data. The report will also include the correlation of lower furnace gas temperature versus gas temperature leaving superheater. The gas temperature leaving the superheater (monitored by a plant permanent thermocouple) will be correlated to the furnace temperature at the burner elevation shall be incorporated into the report provided such correlation exists.

Test Selling Price:

The selling price for this test is based on using the client's manpower to set-up and maneuver the HVT probes. The HVT test activities will be comprised of seven total days (2) days travel, 3 days testing and 2 days set-up/teardown). The selling price may be modified to reflect any changes in the final test plan as compared to the test schedule outlined above.

Based on the proposed test schedule, the selling price for conducting this HVT test is

Delays in testing due to problems not caused by Babcock & Wilcox Company will be charged at Any testing beyond the proposed three eight hour days will be charged either at this per diem rate or double the hourly rate for time on weekends, holidays, or in excess of eight hours per day.

This test and its results are separate and independent of the base boiler contract. No warranties or guarantees are implied.