

Memorandum

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Bureau of  
Air Regulation

TO: Bruce Mitchell  
Tom Atkeson  
Steve Pace

FROM: Buck Oven *gH3 O*

DATE: February 14, 1995

SUBJECT: Cedar Bay Cogeneration Project - Mercury  
Test Program PA 88-24

Attached for your review and comment is a Memo from the Northeast District concerning the results of the mercury testing program at the Cedar Bay Facility.

Attach:

cc: Richard Donelan

NORTHEAST DISTRICT - JACKSONVILLE

TO: Hamilton Oven, P.E.  
FROM: Morton Benjamin *MB*  
THRU: Christopher Kirts, P.E. *CK*  
DATE: February 8, 1995  
SUBJECT: Cedar Bay Generating Company  
Phase I Mercury Testing

Mercury tests were conducted on July 27, 28, 29, 1994 to meet the requirements of the conditions of Certification (II.2.c.). From this test data, a determination of whether carbon injection would be beneficial to reducing mercury emissions would be made.

The test report points out that at the boiler flue gas temperatures of 330-360°F carbon injection is not reasonable based upon EPRI studies (higher than where carbon injection was successful).

Comparison of the Cedar Bay mercury results with other coal fired electrical utility boilers indicates Cedar Bay emissions are low. (Tables 8.2A and 8.2B in report)

In addition to the Phase I testing in July, Cedar Bay conducted mercury testing at the end of January 1994. Looking at the tests as a whole, the results are consistently low in comparison to the standard.

A thorough Quality Assurance program was undertaken during the Phase I tests. An experienced consultant participated in all phases of the testing and analyses. Certified reference samples were also provided.

With all of the foregoing considerations in mind, the Northeast District is satisfied with the results of testing. We believe the mercury results are sufficiently low and no further studies are needed other than normal compliance tests.

CEDAR BAY GOGENERATING  
MERCURY TEST RESULTS  
lbs/Hr

Initial  
Compliance  
Tests

Unit 1  
 $5.8 \times 10^{-4}$   
2/3

Unit 2  
 $4.9 \times 10^{-3}$   
1/28

Unit 3  
 $1.3 \times 10^{-3}$   
2/1

Phase I

$6.28 \times 10^{-3}$   
7/27

$2.63 \times 10^{-3}$   
7/28

$1.69 \times 10^{-3}$   
7/29

Allowed  $3 \times 10^{-2}$  lbs/Hr

**TABLE 8.2A - COMPARISON OF FCG AND CBCP MERCURY IN COAL STUDIES**

|            | Samples |           |       | Mercury ( $\mu\text{g/g}$ ) |             |
|------------|---------|-----------|-------|-----------------------------|-------------|
|            | Single  | Duplicate | Total | Mean                        | Std. Dev'n. |
| FCG Study  | 30      | 26        | 56    | 0.100                       | 0.032       |
| CBCP Study | 50      | 0         | 50    | 0.050                       | 0.033       |

FCG, as part of their study, also presented a summary of mercury-related findings from EPRI and DOE. This summary was intended to build a database of information on atmospheric emissions of mercury and other chemical substances from fossil fuel-fired steam generating units. Average flue gas mercury emissions rates with their corresponding ninety-five percent confidence intervals from the EPRI and DOE tests are included in Table 8.2B, along with the CBCP results. The EPRI and DOE results are grouped by type of particulate and SO<sub>2</sub> control system.

**TABLE 8.2B - COMPARISON OF CBCP MERCURY EMISSIONS WITH EPRI AND DOE FINDINGS**

| Source   | Control System                                | Number of Tests | Hg Emissions ( $\mu\text{g}/\text{Nm}^3$ ) |        |
|----------|---|-----------------|--|--------|
|          |   |                 | Mean                                       | 95% CI |
| EPRI/DOE | Electrostatic Precipitator                    | 19              | 8.17                                       | 1.69   |
| EPRI/DOE | Fabric Filter                                 | 5               | 6.98                                       | 9.48   |
| EPRI/DOE | Electrostatic Precipitator with Fabric Filter | 24              | 7.92                                       | 2.14   |
| EPRI/DOE | Flue Gas Desulfurization                      | 9               | 6.08                                       | 3.47   |
| CBCP     | CFB with Fabric Filter                        | 9               | 1.16                                       | 0.63   |

CBCP mercury emissions are the lowest presented, which may be a result of lower coal mercury content, along with control technology differences. The data may indicate a better inherent mercury removal efficiency of the CFB/fabric filter control technology, when compared to the pulverized coal boilers at which most of the DOE and EPRI data was collected.