Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609

MAY 18 1993

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of	)	Docket Nos. 50-259
Tennessee Valley Authority	)	50-260
		50-296

BROWNS FERRY NUCLEAR PLANT (BFN) - CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS) CORRECTIVE ACTIONS (TAC NOS. M83348, M83349, AND M83350)

References: 1) TVA letter to NRC, dated July 31, 1992, Resolution of Control Room Emergency Ventilation System (CREVS) Issues

2) TVA letter to NRC, dated March 1, 1993, Control Room Emergency Ventilation System (CREVS) Corrective Actions

In References 1 and 2, TVA provided its proposed resolution for the previously identified deficiencies with the CREVS. In response to a verbal request for additional information, the enclosure to this letter contains a comparison between the previous CREVS and current CREVS and a summary of the latest surveillance test results.

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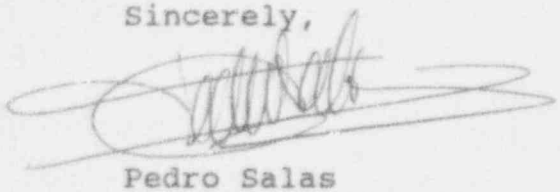
There are no additional commitments contained in this letter. If you have any questions, please telephone me at (205) 729-2636.

Sincerely,



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Enclosure
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MAY 18 1993

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ENCLOSURE
BROWNS FERRY NUCLEAR PLANT (BFN)
CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS)

BACKGROUND:

The previous Control Room Emergency Ventilation System (CREVS) was designed to protect the control room operators by automatically starting upon receipt of a control room isolation signal and pressurizing the main control bay habitability zone (CBHZ) with filtered outdoor air during accident conditions that could result in radioactive releases. The CREVS uses charcoal adsorbers to assure the removal of radioactive iodine from the air and high efficiency particulate absolute (HEPA) filters for removing radioactive particulate matter.

During the Unit 2 Cycle 5 outage, an employee concern identified a specific condition that could impact the ability of the CREVS to provide an environment suitable for personnel occupancy. The Control Building air supply ducts are not designed or fabricated to be leak tight. Unfiltered outside air could leak from the seams/joints of the supply air ducts that traverse the control bay habitability zone. This duct leakage could result in outside air bypassing the CREVS and introducing potentially contaminated and unfiltered outside air into the control bay habitability zone.

In References 1 and 2, TVA provided its proposed resolution for the identified deficiencies with the CREVS. In response to a verbal request for additional information, the enclosure to this letter contains a comparison between the previous CREVS and current CREVS and a summary of the latest surveillance test results.

COMPARISON:

Attached are simplified diagrams of the previous CREVS (Figure 1) and current CREVS (Figure 2). Also listed below is a comparison of major design aspects of the previous CREVS and the current CREVS:

PREVIOUS CREVS	CURRENT CREVS
Two 500 cfm CREVS trains and units.	Two 3,000 cfm CREVS trains and units.
Each train power by a separate, diesel backed, electrical division.	Same.

ENCLOSURE
BROWNS FERRY NUCLEAR PLANT (BFN)
CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS)
(CONTINUED)

PREVIOUS CREVS	CURRENT CREVS
Each train contained a fan unit, drawer type charcoal adsorber, and down stream HEPA filter.	Both trains share a common upstream HEPA filter. Each CREVS unit contains a relative humidity heater, fan unit, drawer type charcoal adsorber, and an after-filter.
Each CREVS train took supply air from separate portions of ductwork that serve the electric board rooms located in the Reactor Building. This supply ductwork transverses the CBHZ.	Each CREVS train takes suction from separate building intake ducts that are located on the East and West sides of the Turbine Building. This new ductwork is fabricated from three-sixteenth inch plate (Correction from TVA's March 1, 1993 letter, which stated it was a three-eighth inch plate), which is heavier than the normal requirements for three psi ductwork. The ducts serving CREVS become a common header at the Unit 2 vent tower.
Supply ductwork in the control bay vent towers was not tornado missile protected.	The supply ductwork serving CREVS is not tornado missile protected.
Both CREVS trains automatically started upon receipt of a control room isolation signal.	Only one of the CREVS trains starts upon receipt of a control room isolation signal.
Each CREVS train was designed to maintain the CBHZ at a slight positive pressure and to ensure essentially zero unfiltered inleakage.	A single CREVS train will assist other sources of pressurization in maintaining the CBHZ at a half inch water gauge positive pressure.

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(CONTINUED)

TEST RESULTS:

The control bay habitability zone (CBHZ) is located on the top floor of the Control Building. The CBHZ contains the Units 1, 2, and 3 control rooms, equipment rooms, relay room, lunch room, rest rooms, and office spaces. The Control Bay ventilation towers, located on the north wall of the reactor building, provide the outside air for the Control Building supply ductwork. Ventilation supply fans, which are located in the ventilation towers, pressurize this supply ductwork, including the ductwork that traverses the main control bay habitability zone. Some of the fans operate during the accident recovery period (30 days) to supply necessary cooling for essential equipment. In addition, the cable spreading room ventilation system, while not required to operate after an accident, is not prohibited from functioning after an accident. This could also contribute to the unfiltered inleakage into the habitability zone.

Surveillance Instruction 0-SI-4.7.E.7, Control Bay Habitability Zone Leakage Rate Test, was conducted on May 16, 1993 to determine the unfiltered inleakage rate into the CBHZ. This surveillance was conducted by isolating the CBHZ, including the supply and exhaust fans and ductwork that provide ventilation air to and from the outside, isolating the CREVS, and pressurizing the CBHZ by using a test fan (door mounted fan).

TVA determined the amount of flow necessary to maintain the CBHZ at various positive pressures. Readings were taken from an average CBHZ pressure of 0.09 inches water gauge to 0.41 inches water gauge, using a single door fan. Two test fans were used to bring the CBHZ pressure up to a half inch water gauge. However, the data with two test fans in operation was determined not to be credible. Hence, an extrapolation of the previous test data was used to determine the unfiltered inleakage rate at a CBHZ pressure of a half inch water gauge (Figure 3).

ENCLOSURE
BROWNS FERRY NUCLEAR PLANT (BFN)
CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS)
(CONTINUED)

The maximum unfiltered inleakage into the CBHZ was assumed to be the flow rate required to maintain the CBHZ at a half inch water gauge. The control room operator dose was calculated using this extrapolated unfiltered inleakage rate and this calculation is considered to be conservative. The CREVS units and the special test fan were not running simultaneously. Pressurization of the habitability zone from the CREVS units, which would occur during post-accident habitability zone isolation conditions, would result in a decrease in the rate of unfiltered inleakage. Since the habitability zone would be at a relatively higher pressure compared to adjacent areas, all other leakage would be out of the habitability zone.

The major parameters/data from the CBHZ surveillance test are shown in the attached table. The results of the test were:

- The outleakage is linear with respect to CBHZ boundary pressure. This was concluded from a linear plot of the log of the CBHZ pressure versus the log of the pressurizing flow rate.

- An extrapolation of the log-log plot showed an unfiltered inleakage rate of 3835 cfm at a CBHZ pressure of 0.51 inches water gauge. This compared favorably to an estimated value of 3717 cfm at a pressure of 0.50 inches water gauge as discussed in Reference 1. The resulting thyroid dose to the control room operator is less than the 18.0 REM stated in TVA's March 1, 1993 letter to NRC since, during the current Unit 2 Cycle 6 outage, TVA replaced the manually operated stack isolation dampers with automatically closing backdraft dampers. This modification lessened the amount of ground level release from the base of the stack, and hence, lowered the overall dose.

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BROWNS FERRY NUCLEAR PLANT (BFN)

TABLE
CONTROL BAY HABITABILITY ZONE
SURVEILLANCE TEST RESULTS

Fan Flow Rate (cfm)	Fan Flow Rate (M^3/S)	Average Pressure (inches w.g.)	Average Pressure (P_s)	Door Fan (inches w.g.)	Unit 1 Manometer (inches w.g.)	Unit 3 Manometer (inches w.g.)	Unit 1/2 Mech. Equipment Room Manometer (inches w.g.)
1,639	0.77	0.09	22	0.05	0.10	0.08	0.12
1,919	0.91	0.13	33	0.10	0.15	0.12	0.15
2,256	1.07	0.18	45	0.15	0.20	0.17	0.20
2,571	1.21	0.23	58	0.20	0.24	0.22	0.25
2,764	1.30	0.27	68	0.25	0.29	0.26	0.29
2,958	1.40	0.32	80	0.31	0.33	0.30	0.33
3,191	1.51	0.35	88	0.35	0.36	0.33	0.37
3,469	1.64	0.41	103	0.40	0.41	0.39	0.42
3,825[1]	1.81	0.51	128	0.51	0.52	0.48	0.52
3,189[2]	-	0.34	-	-	0.35	0.30	0.36

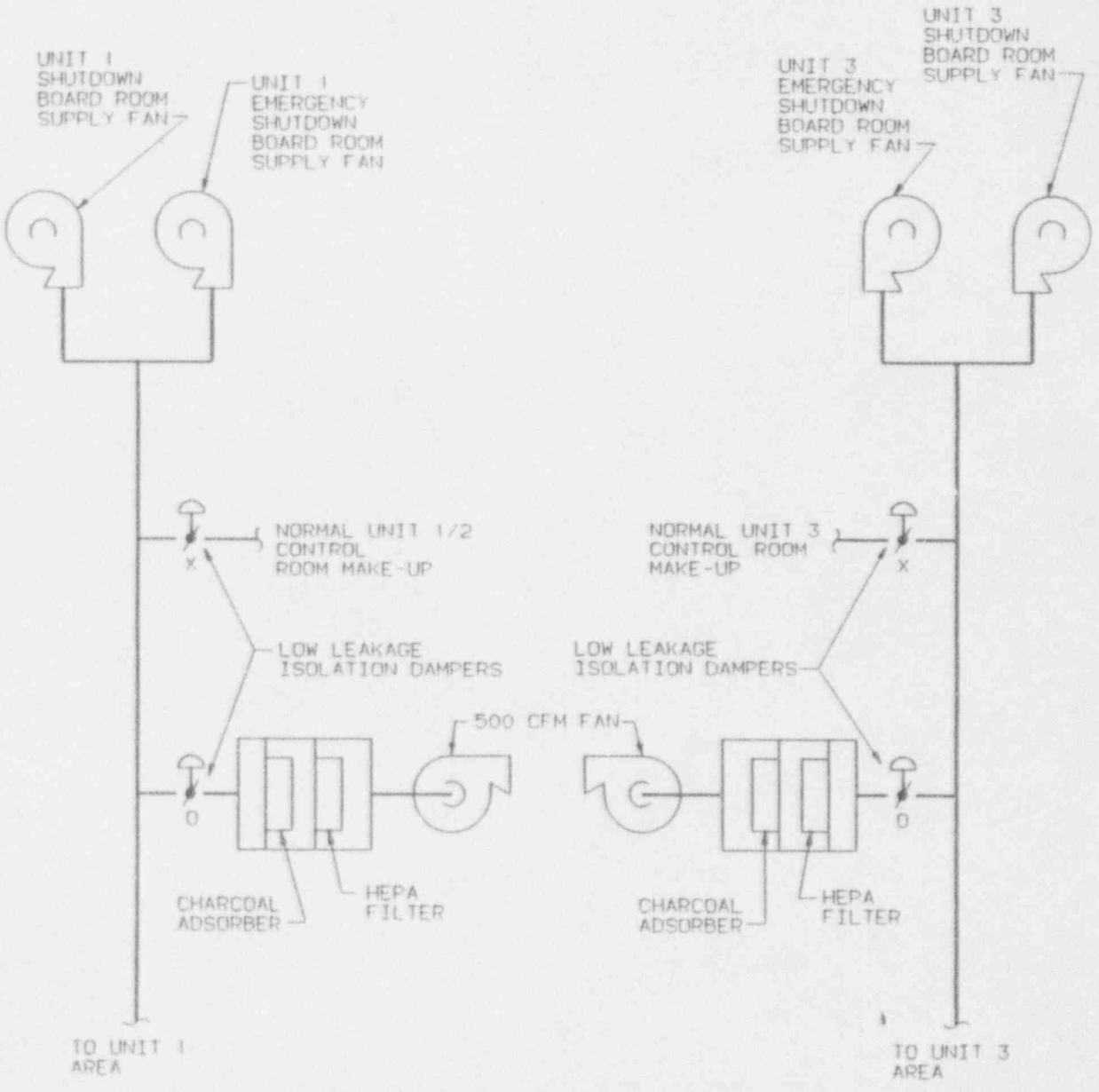
Footnotes:

[1] - Value extrapolated from log-log plot of the data.

[2] - Values with CREVS running in lieu of the test fan.

ENCLOSURE
BROWNS FERRY NUCLEAR PLANT (BFN)

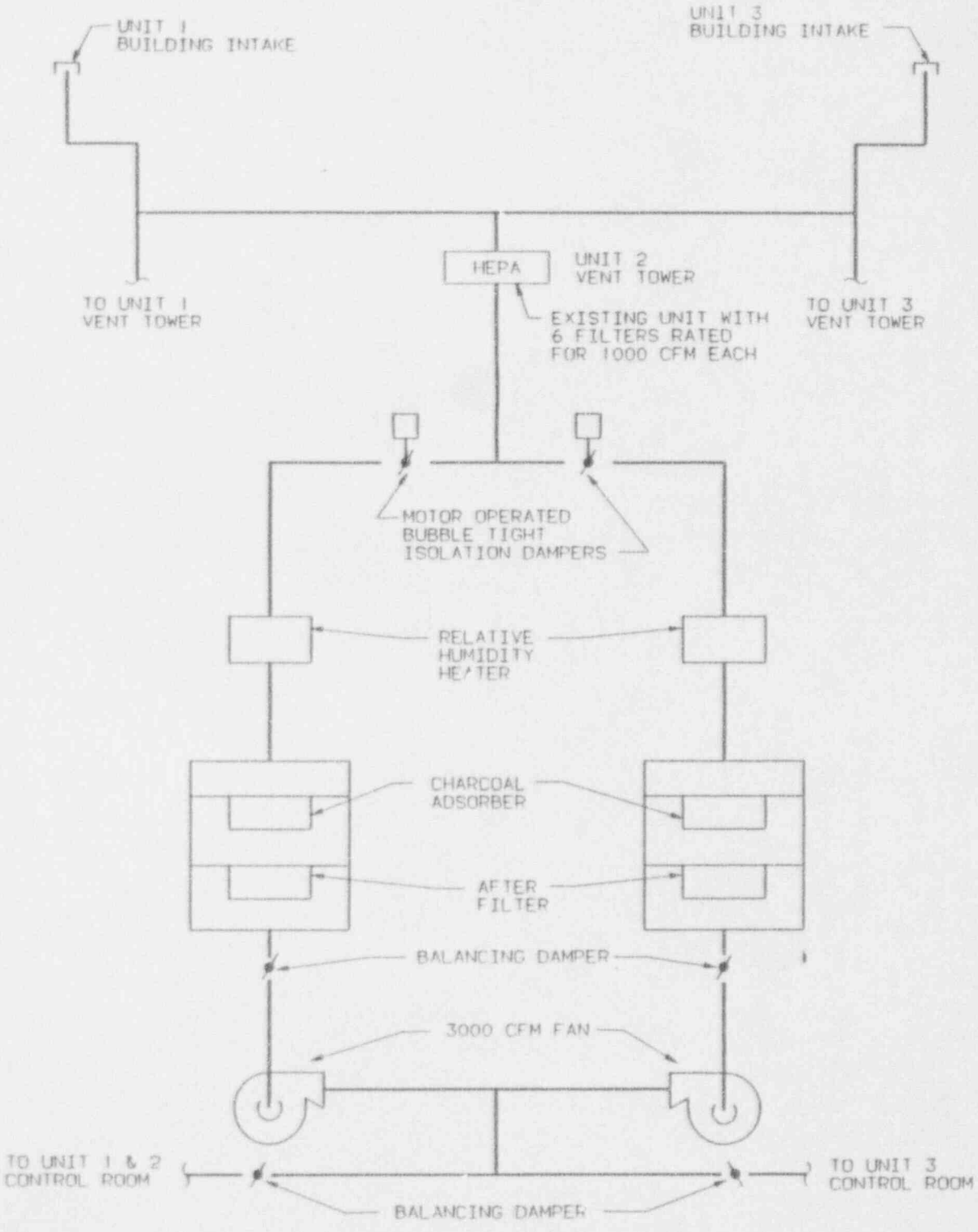
FIGURE 1
PREVIOUS CREVS CONFIGURATION



SCHEMATIC: 500CFM CREVS UNITS
(ABANDONED)

ENCLOSURE
BROWNS FERRY NUCLEAR PLANT (BFN)

FIGURE 2
CURRENT CREVS CONFIGURATION



SCHEMATIC: CREVS FILTER SYSTEM

ENCLOSURE
BROWNS FERRY NUCLEAR PLANT (BFN)

FIGURE 3
SURVEILLANCE TEST RESULTS
LOG-PRESSURE VERSUS LOG-FLOW