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

R. D. (Rick) Machon
Vice President, Browns Ferry Nuclear Plant

September 20, 1994

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

10 CFR 21

Dear Sir:

BROWNS FERRY NUCLEAR PLANT (BFN) UNITS 1, 2, AND 3 - DOCKET NOS. 50-259, 50-260, AND 296 - FACILITY OPERATING LICENSE DPR-33, 52, AND 68 - LICENSEE EVENT REPORT 50-259/94003

The enclosed report provides written notification, in accordance with 10 CFR 21.21(c)(3)(ii), of a defect or failure to comply regarding four 25-ton safety-related, water cooled air conditioning units (ACUs). Ellis and Watts supplied the ACUs. Initial notification required by 10 CFR 21.21 (c)(3)(i) was made by facsimile to the NRC Operations Center on August 23, 1994.

If you have any questions or comments please telephone Pedro Salas at (205) 729-2636.

Sincerely,

E. Preston for R.D. Machon

R. D. Machon
Site Vice President
PAB 1E-BFN

Enclosure
cc: See page 2

IE28
1/1

Enclosure
cc (Enclosure):

INPO Records Center
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NRC Resident Inspector
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NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Browns Ferry Nuclear Plant (BFN) Unit 1	05000259	1 OF 4

TITLE (4) A Defect was discovered in the pressure rating for the BFN Unit 1 and 3 Air Conditioning Units supplied by Ellis and Watts

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
07	13	94	94	003	00	09	20	94	BFN Unit 3	05000296
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N
POWER LEVEL (10)	000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
	20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)
	20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)	X	OTHER
	20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		Part 21
	20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		
	20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Duncan Massey, Licensing Engineer	(205)729-7953

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
B	KM	ACU	E322	N						

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

This event concerns a defect involving four (4) 25-ton safety-related, water cooled Air Conditioning Units (ACUs) manufactured by Ellis and Watts. The ACUs are only installed in BFN Units 1 and 3 (two in each unit), but the ACUs have not yet been operated. On July 13, 1994, TVA discovered that the ACU condensers were designed to a lower pressure than their operating pressure. The condensers were designed and American Society of Mechanical Engineers Section (ASME) VIII stamped for a pressure of 150 psig. However, under post-accident conditions, the condensers could experience an operating pressure of 300 psig. The ACUs provide cooling to the Unit 1 and Unit 3 electrical board rooms. The design error in the condensers applies to all four ACUs (common mode failure) and could cause their failure when operated. However, no current safety hazard exists since BFN Units 1 and 3 are defueled and the ACUs are not required to be operational. This event does not affect the operating unit (i.e., Unit 2). TVA performed a substantial safety hazard determination and, on August 23, 1994, determined that this event was reportable per 10 CFR Part 21.

1. **Name and address of the Individual (or individuals) informing the Commission.**

   R. D. Machon, Site Vice President
   Browns Ferry Nuclear Plant
   Browns Ferry Nuclear Plant Road
   Athens, Alabama 35611

2. **The facility, the activity, or the basic component supplied for such facility or such activity within the U.S. which failed to comply or contains a defect.**

   The defect involves four 25-Ton safety related water cooled air Conditioning Units (ACUs) installed for BFN Units 1 and 3.

3. **The firm constructing or supplying the basic component which fails to comply or contains a defect.**

   Ellis and Watts supplied the ACUs. International Telephone and Telecommunication (ITT) Standard supplied the water cooled condensers (a subcomponent of the ACUs) to Ellis and Watts.

4. **Nature of the defect, or failure to comply, and the safety hazard created, or could be created.**

   Nature of the defect or failure to comply

   The condensers for the ACUs were designed to a lower pressure than the system (refrigerant) operating pressure. During the procurement process for the ACUs, TVA and its subcontractor, Bechtel, provided Ellis and Watts with the plant parameters needed for the ACUs (e.g., cooling capacity required, air temperature, condenser cooling water temperature and flow rate). Ellis and Watts provided this information to their subcontractor, ITT Standard. Ellis and Watts subsequently informed TVA that the condensers should be designed and ASME Section VIII stamped for shell side (refrigerant side) pressure of 150 psig. This pressure was then specified in the purchase specifications for the ACUs.

   During performance testing at the factory, normal pressure at the compressor discharge (inlet to the condensers) was 277 psig and for post accident conditions the pressure reached 300 psig. The shell-side safety relief valve and the compressor high-pressure cutoff switch were set to 350 psig. Thus the condensers shell-side would be subjected to a pressure well above their design.

Evaluation of Safety Hazard Created

Currently, BFN Unit 2 is operating with Units 1 and 3 defueled. No immediate safety hazard exists since these ACUs are not required with Unit 1 and 3 defueled and their failure does not impact the operating unit. Temporary cooling is provided for Unit 1 and 3 components needed for Unit 2 support. The Unit 2 ACUs are not affected by this design problem.

Evaluation of Potential Safety Hazard Created

Units 1 and 3 each have two redundant ACUs (total of four, two for Unit 1 and two for Unit 3), each having 100% capacity to cool the electric board rooms in their respective units. The electric board rooms contain numerous safety-related components including 480 volt and 4KV distribution systems (480 volt and 4KV Boards). The 480 volt distribution system provides power to the ACUs, safety-related 480 volt Motor Control Centers, 480 volt power for safety-related isolation valves, containment monitoring sample pumps, standby gas treatment system blowers, and numerous emergency ventilation blowers. The electric board rooms also contain 4KV distribution systems providing Class 1E 4KV power to safety-related equipment and 4KV power to the diesel generator distribution system.

The design error in the condensers applies to all four of the ACUs (common mode failure) and could cause failure of both safety-related ACUs in a reactor unit. If the ACU condensers fail due to overpressurization, the ACUs cannot provide the necessary cooling for the Electrical Board Rooms resulting in a temperature in excess of the Environmental Qualification of the components served by the ACUs.

5. **The date on which the information of such defect or failure to comply was obtained.**

TVA notified Ellis and Watts of this condition on July 13, 1994.

6. **In the case of a basic component which contains a defect or fails to comply, the number and location of all such components in use at, supplied for, or being supplied for one or more facilities or activities.**

There are four total ACUs (two for Unit 3 and two for Unit 1), with each ACU having one condenser. The Unit 2 ACUs are not affected by this design problem.

7. **The corrective action planned or being taken, the responsible organization, and the schedule for completion of planned actions.**

   A refrigerant cycle analysis is being performed to ensure a coordinated design pressure. The condensers are being removed, rebuilt, and restamped to the proper design pressure by Ellis and Watts through ITT Standard. The condensers will then be reinstalled and overall ACU system tested prior to Unit 3 fuel load.

8. **Any advice that has been given, is being, or will be given, about the defect.**

   Ellis & Watts has indicated to TVA that these ACUs were custom designed for BFN and that this problem should not apply to any other ACUs.

9. **Commitments**

   All four ACU's will be reworked prior to Unit 3 Fuel Load.