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)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Dresden Nuclear Power Station, Unit 2	05000237	1 OF 5

TITLE (4)
Inoperable Control Room HVAC Booster Fans Due To Improperly Sized Thermal Overload Heater Devices Caused By a Design Process Deficiency

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
01	03	95	95	-- 001 --	01	08	29	97	Dresden Unit 3	05000249
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N (N)
POWER LEVEL (10)	098 (097)

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

	20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(iii)		73.71(b)
	20.2203(a)(1)		20.2203(a)(3)(ii)		50.73(a)(2)(iv)		73.71(c)
	20.2203(a)(2)(i)		20.2203(a)(4)	X	50.73(a)(2)(v)		OTHER
	20.2203(a)(2)(ii)		50.36(c)(1)		50.73(a)(2)(vii)		(Specify in Abstract below and in Text, NRC Form 366A)
	20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(viii)(A)		
	20.2203(a)(2)(iv)		50.73(a)(2)(i)		50.73(a)(2)(viii)(B)		
	20.2203(a)(2)(v)		50.73(a)(2)(ii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
P. Garrett, Plant Engineering Ext. 2713	(815) 942-2920

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
N/A										

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)

On January 3, 1995, at 2300 hours, with Unit 2 at 98% rated core thermal power and Unit 3 at 97% rated core thermal power, during Dresden Operating Surveillance (DOS) 5750-01, the Control Room heating, ventilation, and air conditioning (HVAC) system, booster fan A tripped. The surveillance was continued by operating booster fan B. Booster fan B operated successfully. An engineering evaluation was performed to determine the cause of the trip for booster fan A. That evaluation stated that the thermal overload (TOL) devices for booster fans A and B were set at a level that would not prevent spurious trips during normal plant conditions (including degraded voltage conditions). Both Control Room HVAC booster fans were declared inoperable, effective the date of the trip of the booster fan A. The booster fan A TOL device was replaced at 2128 hours on January 7, 1995, and the Control Room HVAC System was declared operable at that time. The booster fan B TOL device was replaced at 2233 hours on January 10, 1995. The cause of this event was a design process deficiency. The current modification process includes technical guidance for selecting TOLs. The safety significance of this event is considered minimal.

PLANT AND SYSTEM IDENTIFICATION

General Electric - boiling water reactor - 2527 MWt rated core thermal power.

Energy Industry Identification System (EIIS) codes are identified in the text as [XX] and are obtained from IEEE Standard 805-1984, IEEE Recommendation Practice for System Identification in Nuclear Power Plants and Related Facilities.

Control Room HVAC System [VI]

EVENT IDENTIFICATION:

Inoperable Control Room HVAC Booster Fans Due To Improperly Sized Thermal Overload Heater Devices Caused By a Design Process Deficiency

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 2/3 Event Date: January 3, 1995 Event Time: 2300 hours

Reactor Mode: N (N) Mode Name: Run (Run) Power Level: 97% (91%)

Reactor Coolant System Pressure: 999 psig (996 psig)

B. DESCRIPTION OF EVENT:

On January 3, 1995, at 2300 hours, with Unit 2 at 98% rated core thermal power and Unit 3 at 97% rated core thermal power, during performance of Dresden Operating Surveillance (DOS) 5750-01 on the Control Room heating, ventilation, and air conditioning (HVAC) system, booster fan A tripped. The surveillance was continued by operating booster fan B. Booster fan B operated successfully. An engineering evaluation was performed to determine the failure mode of the booster fan A trip. That evaluation determined that the thermal overload (TOL) devices for the booster fans of both the A and B Control Room HVAC system were set at a level that would not prevent spurious trips during normal plant conditions (including during degraded voltage conditions). Both Control Room HVAC booster fans were declared inoperable, effective the date of the booster fan A trip, January 3, 1995.

The booster fan A TOL device was replaced at 2128 hours on January 7, 1995, and the Control Room HVAC System was declared operable at that time. The booster fan B TOL device was replaced at 2233 hours on January 10, 1995.

No other system or component inoperabilities have been identified which contributed to the event. In addition, no manual or automatic engineered safety feature (ESF) actuation occurred as a result of this event.

C. CAUSE OF EVENT:

This event is being submitted in accordance with 10CFR50.73(a)(2)(v) which requires the reporting of any event or condition that could have prevented the fulfillment of the safety functions of systems that are needed to mitigate the consequences of an accident.

The root cause of the fan trip was determined to be that the TOL heater devices for the Control Room HVAC booster fans, both A and B, were incorrectly selected and sized to provide sufficient margin to prevent spurious tripping due to a Design Process Deficiency (NRC cause code B, inadequate design). The design process for the modification that installed the B Train of Control Room HVAC (modification M12-2/3-82-1) did not provide sufficient guidance for sizing of the TOL. This resulted in insufficient margin to ensure the TOL would not spuriously trip.

D. SAFETY ANALYSIS:

The safety function of the Control Room HVAC System is to maintain the habitability of the Control Room, such that the plant can be safely shutdown under all design basis conditions. The function of the Booster Fans is to provide filtered makeup air to pressurize the Control Room. If both Booster Fans were to fail during a design basis event, it would have two undesirable results. First, the Control Room HVAC System would not be able to maintain a positive pressure relative to the adjacent areas in the Control Room. The positive pressure is designed to ensure that any airborne contamination (that might result from the event) does not enter the Control Room. Secondly, the Control Room HVAC System would not be able to filter contaminated outside air through a charcoal filter, a process that would remove airborne contamination that may have entered the Control Room. Upon the Station's notification by engineering that the TOL devices for both A and B trains were incorrectly set, the Control Room HVAC System was administratively declared inoperable.

The Control Room HVAC System's isolation/pressurization mode is manually operated, and has no automatic start feature. It is required to be manually started within 40 minutes of a Design basis Accident. In the surveillance of January 3, 1995, booster fan A operated for over four hours, out of a surveillance requirement of five hours, before tripping. Booster fan B ran successfully throughout its five hour surveillance period. Although the system is fundamentally a single train, with many of its components lacking a redundant or diverse backup component, the two booster fans are redundant to each other: either fan alone could support the safety function of the Control Room HVAC System. If one or the other booster fan tripped (i.e. due to the improper setting of its TOL device), the TOL device could be manually reset within a matter of minutes. By that time, they would have cooled, thus allowing the system to be manually restarted. The worst resulting circumstance would have been that the operators may have had to alternate operation of booster fan A with booster fan B, switching the fans every few hours, and if necessary, occasionally resetting the TOL device. This is considered to have a minimal impact on the ability to safely shutdown the plant. Therefore, the safety significance of this event is considered to be minimal.

The above safety analysis was developed at the time of the event based on the information available. Subsequent, to the event, on October 7, 1996, it was identified that the Control Room HVAC system was significantly outside of its design basis. This was reported to the NRC in LER 96-017-01, Docket number 05000237.

E. CORRECTIVE ACTIONS:

Nuclear Tracking System (NTS) tracking code numbers are identified in the text as (XXX-XXX-XX-XXXXX).

Immediate corrective action was to initiate Work Requests D29206 (Train A) and D29207 (Train B) to replace the TOL devices. The new TOL model numbers and settings were provided by Plant Support Engineering. The TOL devices for both Booster Fans were replaced, set properly, and tested. The Control Room HVAC System was declared operable at 2128 hours on January 7, 1995. (Complete)

Guidance was developed in 1993 for selection and setting of TOLs, Technical Information Document-E/I&C-03. (Complete)

In view of the root cause determined for this event, Dresden Station has performed a complete review of the modification that installed the B Train of Control Room HVAC (modification M12-2/3-82-1). That review uncovered no reason to call into question the operability of the Control Room HVAC System. However, subsequent review in October 1996, identified that the Control Room HVAC was significantly outside its design bases and was declared inoperable. It is believed to have been outside its design basis since installation of modification M12-2/3-82-1. This was reported to the NRC in LER 96-017-01, Docket number 05000237.

System Engineering reviewed existing Dresden Operating Procedures and evaluated a motor replacement to improve the air filtration system operation. DOS 5750-01 and DOS 5750-03 were deleted and DOS 5750-04 was written to perform the monthly surveillance under design conditions and verify operability of the air handling unit and the air filtration unit at the same time. The engineering study concluded that motor replacement was unnecessary, but thermal overload devices were upgraded for each motor. (Complete, NTS# 237-180-95-00101)

F. PREVIOUS OCCURRENCES:

LER/Docket Numbers	Title
92-032/050237	Inadequate 4KV Degraded Voltage Setting Resulting in Control Room Air Filtration Unit Booster Fans Inoperable due to Inaccurate Calculational Assumption.

The Nuclear Engineering Department notified Dresden Station that a calculation of the "Second Level Undervoltage Setpoint" revealed an inadequate voltage supply to the A and B Train Booster Fans. Replacement of control power transformers resolved the situation, and the system was declared operable.

94-007/050237 Potentially Unanalyzed Control Room Habitability Condition due to Purge Mode.

A Systems Engineer noted that the Control Room HVAC System was operating in the "outside purge" mode. This mode provided for a supply of outside make-up air at a rate in excess of the analyzed value of 2000 scfm. Administrative controls were put in place to assure the system remains in the normal mode of operation.

G. COMPONENT FAILURE DATA:

Manufacturer	Nomenclature	Model Number	Mfg. Part Number
N/A	N/A	N/A	N/A

This event is not the result of a failed component, but rather an improper setpoint. The TOL device did its job, by tripping the motor on what it observed to be a slightly excessive current for a prolonged time.