NRC FORM 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

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TITLE (4)
Two Trains of Standby Gas Treatment Inoperable

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
									Unit 3	05000269
03	08	1999	1999	-- 001 -	00	04	07	1999	NA	DOCKET NUMBER 05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)	096		20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)
			20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
			20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify In Abstract below or In NRC Form 366A
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Steve Austin, Senior Licensing Project Manger	256.729.2070

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

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 March 8, 1999, at approximately 2042 hours Central Standard Time (CST), it was determined that two trains of Standby Gas treatment (SGT) were inoperable. Prior to the event, on March 8, 1999, at approximately 0518 hours CST, B SGT train was removed from service for planned maintenance activities. The appropriate seven day Technical Specification (TS) Limiting Condition for Operation (LCO) for one inoperable SGT train was entered. At approximately 2038 hours CST, B SGT train was placed in service to support planned post maintenance testing activities. At 2042 hours CST, C SGT was declared inoperable due to a tripped blower motor breaker and, TS LCO 3.0.3 was entered for Units 2 and 3. Operations commenced a TS required shutdown of both operating Units 2 and 3. At 2237 hours CST, C SGT was declared operable and TS LCO 3.0.3 was exited. The cause of this event was a trip of the C SGT blower motor breaker. Subsequent testing of the tripped breaker revealed no definitive cause for the trip of the C SGT train blower breaker. This report is submitted in pursuant to 10 CFR 50.73 (a) (2) (i) (B) as any operation or condition prohibited by the plant's Technical Specifications.

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I. PLANT CONDITION(S)

At the time of the event, Unit 1 was shutdown and defueled. Unit 2 was in Mode 1 at 96 percent reactor power, approximately 3160 megawatts thermal, coasting down for a scheduled refueling outage. Unit 3 was in mode 1 at 100 percent reactor power at approximately 3458 megawatts thermal.

II. DESCRIPTION OF EVENT

A. Event:

On March 8, 1999, at approximately 2042 hours Central Standard Time (CST), it was determined that two trains of Standby Gas treatment (SGT) [BH] were inoperable. This required entry into Technical Specification Limiting Condition For Operation 3.0.3 for both Units 2 and 3.

Prior to the event, on March 8, 1999, at approximately 0518 hours CST, B SGT train was removed from service and declared inoperable for planned maintenance activities. The appropriate seven day LCO for one inoperable SGT train was entered. At approximately 2038 hours CST, B SGT train was started to support planned post maintenance testing.

At 2042 hours the Unit 2 operator received alarms, C SGT Train Relative Humidity Heater Temperature High and C SGT Filter Bank Heater Element Power Lost. The control room also received alarm, SGT Train C Unavailable. Accordingly, C SGT train was declared inoperable. Field observations determined that the supply breaker [BKR] for the C SGT train blower [FAN] had tripped.

In accordance with plant TS Action Statement for SGT, with two of three SGT trains inoperable, enter TS LCO 3.0.3. TS LCO 3.0.3 requires in part, when an LCO is not met actions shall be initiated within one hour to place the unit as applicable in: MODE 2 in seven hours, MODE 3 in 13 hours; and mode four in 37 hours. At 2141 hours CST, TVA initiated a reduction in reactor power for both Units 2 and 3 in accordance with General Operating Instruction, Unit Shutdown From Power to Cold Shutdown And Reductions In Power During Power Operations.

Troubleshooting did not identify a cause for the breaker trip. The alarms were caused by the inadvertent operation of the C SGT train heater flow switch, 0-FS-065-0070B [FS], and the C SGT train breaker trip while B SGT train was operating. The breaker was reset and the alarms cleared.

At 2220 hours flow switch 0-FS-065-0070B was declared inoperable. In accordance with the Browns Ferry Technical Requirements Manual Action statement for SGT instrumentation, when one or more of the required flow instrument channels is inoperable, trip the logic for the inoperable flow switch and start the affected SGT subsystem. Therefore, C SGT train was placed in operation with the relative humidity heater controls in the 'ON' position to trip the flow switch logic and subsequently declared operable. Hence, TVA exited TS LCO 3.0.3 at approximately 2237 hours CST.

At 2239 hours TVA made a one hour non-emergency notification to NRC in accordance with 10 CFR 50.72(b)(1)(i)(A) as the initiation of a nuclear plant shutdown required by the plant's Technical Specifications. Units 2 and 3 were returned to the pre-event thermal power by 2309 hours CST and 2311 hours CST respectfully.

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On March 9, 1999, at approximately 2036 hours CST, B SGT train was declared operable, and the seven day LCO for one inoperable SGT train was exited. This report is submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) as any operation or condition prohibited by the plant's Technical Specifications.

B. Inoperable Structures, Components, or Systems that Contributed to the Event:

None.

C. Dates and Approximate Times of Major Occurrences:

March 8, 1999, at 0518 hours CST	B SGT train is removed from service for scheduled maintenance. A seven day LCO for an inoperable SGT train is entered.
2038 hours CST	B SGT train is placed in service.
2042 hours CST	Received alarm C SGT train Relative Humidity Temperature High, followed by alarm B SGT Train Filter Bank Heater Element Power Lost. Alarm SGT Train C Unavailable was also received. Declared C SGT train inoperable and entered TS LCO 3.0.3 for inoperable B and C SGT trains.
2141 hours CST	As required by TS LCO 3.0.3, initiated shutdown of both Units 2 and 3.
2237 hours CST	C SGT is declared operable. TS LCO 3.0.3 is exited. Commenced power ascension back to pre-event thermal power for both Units 2 and 3.
2239 hours CST	TVA made a one hour Non-emergency notification in accordance with 10 CFR50.72 (b) (1) (i) (A).
March 9, 1999, at 2036 hours CST	Following satisfactory completion of post maintenance testing associated with B SGT train, it was declared operable and the seven day LCO for one inoperable SGT was exited.

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

The Unit 2 and 3 operators received alarms indicating C SGT Relative Humidity Heater Temperature High and C SGT Filter Bank Heater Element Power Lost, and alarm, SGT Train C Unavailable.

F. Operator Actions

No operator actions contributed to this event.

G. Safety System Responses

None.

III. CAUSE OF THE EVENT

A. Immediate Cause

The immediate cause of the event was the trip of the C SGT train blower motor breaker thus, rendering C SGT train inoperable. This combined with B SGT train being inoperable for planned maintenance activities, left only A SGT train operable, requiring entry into TS LCO 3.0.3.

The immediate cause for the alarm associated with the relative humidity heater was calibration of the C SGT fan discharge flow switch (0-FS-65-0070B). The switch was out of calibration and was actuated by a small amount of back flow from B SGT train.

B. Root Cause

The root cause for the trip of the C SGT train blower motor breaker could not be identified. The operator dispatched to the associated motor control center (MCC) [ED] noted that the breaker that feeds the C SGT train blower motor had tripped. The operator also noted that no unusual actions were required to close the breaker. This breaker feeds the C SGT train blower motor (which was not running and had not attempted to start) also supplies the control power transformer for the C SGT train blower, damper, and the relative humidity heater.

When the breaker was reported tripped, the MCC breaker cubicle was examined for signs of an electrical fault and no signs were found. A data recorder was connected to the low side of the control power transformer and the control circuit was monitored under conditions similar to the initial event. No unusual values or wave forms were recorded. It was concluded that there were no problems with the control circuit or the transformer.

The breaker was then removed from the MCC and bench tested. The test results verified that the breaker was operating normally and applicable performance parameters were within acceptable limits. The breaker was then disassembled and an internal inspection was performed. Evidence of overheating was observed in the area of the A phase magnetic trip device. The breaker case was discolored and the varnish on the current coil on the trip device appeared burned. The cause of the overheating was determined to be the bolt that secured the movable contact pig-tail to the current sensing coil being insufficiently torqued. The effects of this heating, may have contributed to reduced reliability of the breaker.

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Following the event, the C SGT blower motor breaker was closed and C SGT train was placed in service March 8, 1999, at 2220 hours CST and operated continuously until B SGT was declared operable on March 9, 1999, at 2036 hours. This type breaker does not have any history of failure at BFN; therefore, TVA considers this a random event.

C. Contributing Factors

None.

IV. ANALYSIS OF THE EVENT

The SGT system exhausts the secondary containment atmosphere to the environment through appropriate treatment equipment. The SGT system consists of three fifty percent filter subsystems each with a designed flow rate of 9000 standard cubic feet per minute (SCFM). Two of the three subsystems are necessary for the SGT system to perform its designed function. Two subsystems will draw down the secondary containment to less than or equal to 0.25 inches of vacuum water gauge. During this evolution, planned activities were in progress in accordance with applicable procedural and Technical Specification requirements. The appropriate LCO was entered during the planned testing activities which allows 7 days of continued power operation due to B SGT train out of service.

As soon as the second train of SGT was declared inoperable, the appropriate section of TSs was entered (TS LCO 3.0.3) which required beginning an immediate shutdown. This evolution was performed in accordance with the applicable requirements.

During the time that two SGT were inoperable, B SGT remained functional and continued to operate as designed. Once it was determined that SGT C train could be made operable by manually starting, that train was placed in service and TS LCO 3.0.3 was exited.

An ITE-Gould Model Type HE3-H050 three phase 600 VAC, molded case circuit breaker, was involved in this event. This breaker contains only a magnetic trip device as opposed to the more conventional configuration where both magnetic and thermal trip devices are included. In this configuration, overload protection for the blower is provided by thermal overload heaters associated with the motor starter energized from the breaker. The magnetic trip functions to clear a fault. The breaker does not actuate on a small overload situation.

The blower breaker is unique since it is the only breaker configured with only a magnetic trip device. This type and manufacturer breaker is not utilized in any other application at Browns Ferry Nuclear Plant other than the power feeds to the C SGT train.

V. ASSESSMENT OF THE SAFETY CONSEQUENCES

The potential safety consequences of the condition described were not significant. Actions taken during the event placed the plant in the safest possible configuration. In the event secondary containment isolation is required, the SGT system is required to maintain a negative pressure inside secondary containment at less than of equal to 0.25 inches of water with a flow equal to the allowable secondary containment inleakage and the design basis margin.

As previously discussed from March 8, 1999, at 2042 hours, when C SGT train was declared inoperable,

B SGT train, although inoperable due to lack of completion of post maintenance surveillance test, functioned until C SGT train was declared operable at 2237 hours CST. During that time that C SGT train was inoperable, B SGT train was in the same alignment as that for operation during required conditions. The post maintenance surveillance performed on March 9, 1999, was successful, and B SGT train demonstrated that it would have successfully performed its safety function if called upon.

In the unlikely event that SGT B fails to perform its designed function during a Loss-of-Coolant-Accident, potential exfiltration from the reactor building could occur. However, this is not expected to pose a significant increase in the consequences of an accident. One train of SGT is capable of 9000 SCFM. During the previous secondary containment test, two SGT trains maintained a negative 0.25 inches of water on secondary containment with a total flow of 9363 SCFM. Therefore, one SGT train is capable of maintaining the reactor building at a slight negative pressure.

The results of the BFN Probabilistic Safety Assessment (PSA) which was submitted to NRC on September 1, 1992, support this conclusion. The performance of SGT system is evaluated for a number of severe accident scenarios in the level 2 PSA. The impact of the SGT system on the evaluated source term indicated that SGT system performance is not a dominant fission-product removal mechanism; therefore, postulated reduced SGT performance is not a significant contributor to the accident consequences for evaluated scenarios. Accordingly, there were no actual or potential safety consequences as a result of this event.

VI. CORRECTIVE ACTIONS

A. Immediate Corrective Actions

The immediate corrective actions included, the initiation of shutdown of both Units 2 and 3 due to the unavailability of 2 of the 3 SGT trains (LCO 3.0.3). The C SGT blower motor breaker was reset, C SGT train was started, RH control heater switch placed in the ON position and the train was declared operable.

B. Corrective Actions to Prevent Recurrence

The C SGT train blower motor breaker was replaced and 0-FS-065-0070B was calibrated.

VII. ADDITIONAL INFORMATION

A. Failed Components

None.

B. Previous LERs on Similar Events

LER 50-260/1989-022-01, issued on July 21, 1989, discussed an event where trains A and B of the SGT system were declared inoperable following the discovery that the circuit breakers for their relative humidity control heaters were tripped. The root cause for this event was an inadequate initial design and application of a breaker. The initial design application did not address elevated temperatures in the circuit breaker location. The ambient temperature in the

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area near the circuit breaker as well as lack of ventilation in this area lead to this event. This was not a factor in this event and corrective actions taken would not have prevented occurrence of this event.

VIII. COMMITMENTS

None.

Energy Industry Identification System (EIIS) system and component codes are identified in the text with brackets (e.g., [XX]).