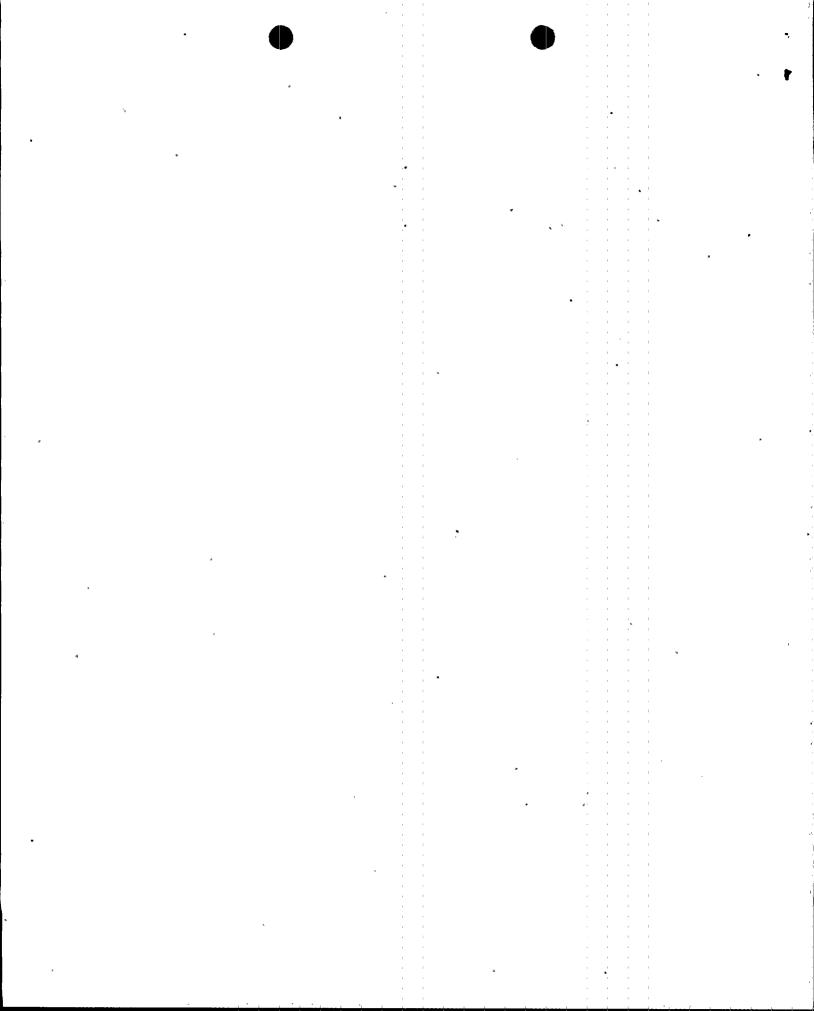
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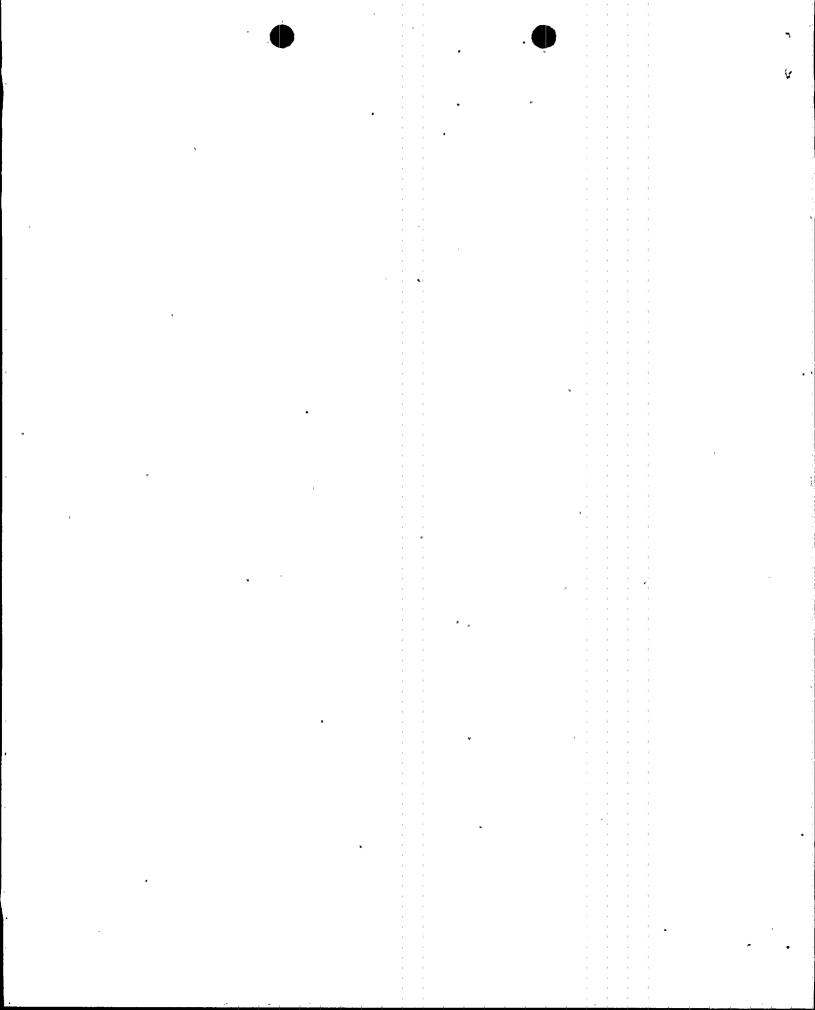


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		EVENT REPORT (L T CONTINUATION	ER)	
,	FACILITY NAME (1)	DOCKET	LER NUMBER (6)	PAGE (3)
			YEAR SEQUENTIAL REVISION NUMBER	2 of 7
Browns Ferry	y Nuclear Plant - Unit 2		I	
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EXT (If more s	pace is required, use additional copies of NRC For	m 366A) (17)		
Ι.	PLANT CONDITION(S)		•	
	At the time of the event, Unit 1 was shi reactor power, approximately 3160 me outage. Unit 3 was in mode 1 at 100 p thermal.	gawatts thermal, coasti	ng down for a scheduled refueli	ng
11.	DESCRIPTION OF EVENT			
	A. <u>Event:</u>		*	
	On March 8, 1999, at approximate determined that two trains of Stand required entry into Technical Speci 2 and 3.	by Gas treatment (SGT) [BH] were inoperable. This	เ Units
	Prior to the event, on March 8, 199 removed from service and declare appropriate seven day LCO for one hours CST, B SGT train was starte	d inoperable for planned e inoperable SGT train v	d maintenance activities. The was entered. At approximately :	
	At 2042 hours the Unit 2 operator r High and C SGT Filter Bank Heate Train C Unavailable. Accordingly, determined that the supply breaker	r Element Power Lost C SGT train was declar	The control room also received red inoperable. Field observation	alarm, SG
Å	In accordance with plant TS Action TS LCO 3.0.3. TS LCO 3.0.3 requ one hour to place the unit as applic four in 37 hours. At 2141 hours CS in accordance with General Operat Reductions In Power During Power	ires in part, when an LC cable in: MODE 2 in sev ST, TVA initiated a redu ling Instruction, Unit Shu	CO is not met actions shall be in ven hours, MODE 3 in 13 hours; ction in reactor power for both U	itlated withi and mode Jnits 2 and 3
	Troubleshooting did not identify a c inadvertent operation of the C SGT breaker trip while B SGT train was	F train heater flow switcl	h, 0-FS-065-0070B [FS], and th	e C SGT tra
	At 2220 hours flow switch 0-FS-065 Ferry Technical Requirements Man the required flow instrument chann the affected SGT subsystem. The heater controls in the 'ON' position Hence, TVA exited TS LCO 3.0.3 a	nual Action statement for lels is inoperable, trip th refore, C SGT train was to trip the flow switch lo	or SGT instrumentation, when one of the second seco	ne or more witch and si lative humic
	At 2239 hours TVA made a one ho 50.72(b)(1)(i)(A) as the initiation of Specifications. Units 2 and 3 were 2311 hours CST respectfully.	a nuclear plant shutdov	wn required by the plant's Techr	nical

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NRC FORM 366A (6-1998)				5, NOCLAN NL	GOLATONT	Commission
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•	FACILITY NAME (1)	DOCKET	YEAR	LER NUMBER (6 SEQUENTIAL	REVISION	PAGE (3)
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Browns Ferry Nucl	lear Plant - Unit 2	05000260	1999	001	00	
TEXT (If more space is	required, use additional copies of NRC Form 366,	4) (17)		•		
	On March 9, 1999, at approximately 203 the seven day LCO for one inoperable S to 10 CFR 50.73(a)(2)(i)(B) as any opera Specifications.	GT train was exite	ed. Thisr	eport is subm	itted pursu	Jant
В.	Inoperable Structures, Components, o	or Systems that (Contribut	ed to the Ev	ent:	
•	None.					
с,	Dates and Approximate Times of Maic	or Occurrences:				
		B SGT train is ren maintenance. A s entered.	noved fro seven day	m service for LCO for an i	schedulec noperable	I SGT train is
	2038 hours CST	B SGT train is pla	aced in se	rvice.		
		Received alarm C High, followed by Element Power Lo received.	alarm B S	GT Train Filt	er Bank H	eater
		Declared C SGT inoperable B and	rain inope C SGT tra	erable and en ains.	tered TS L	.CO 3.0.3 for
		As required by TS and 3.	5 LCO 3.0	.3, initiated st	nutdown o	f both Units 2
		C SGT is declared Commenced pow for both Units 2 a	er ascens	e. TS LCO 3. ion back to p	0.3 is exite re-event th	ed. Iermal power
	2239 hours CST	TVA made a one accordance with 1	hour Non- 10 CFR50	emergency n .72 (b) (1) (i)	otification (A).	in ^r
	March 9, 1999, at 2036 hours CST	Following satisfa testing associate operable and the SGT was exited.	d with B S seven da	GT train, it w	as declare	ed
D.	Other Systems or Secondary Function	ns Affected		•		
	None.					
E.	Method of Discovery					, e
``	The Unit 2 and 3 operators received alar Temperature High and C SGT Filter Ban Unavailable.	rms indicating C S k Heater Element	GT Relat Power Lo	ive Humidity ost, and alarm	Heater I, SGT Tra	in C

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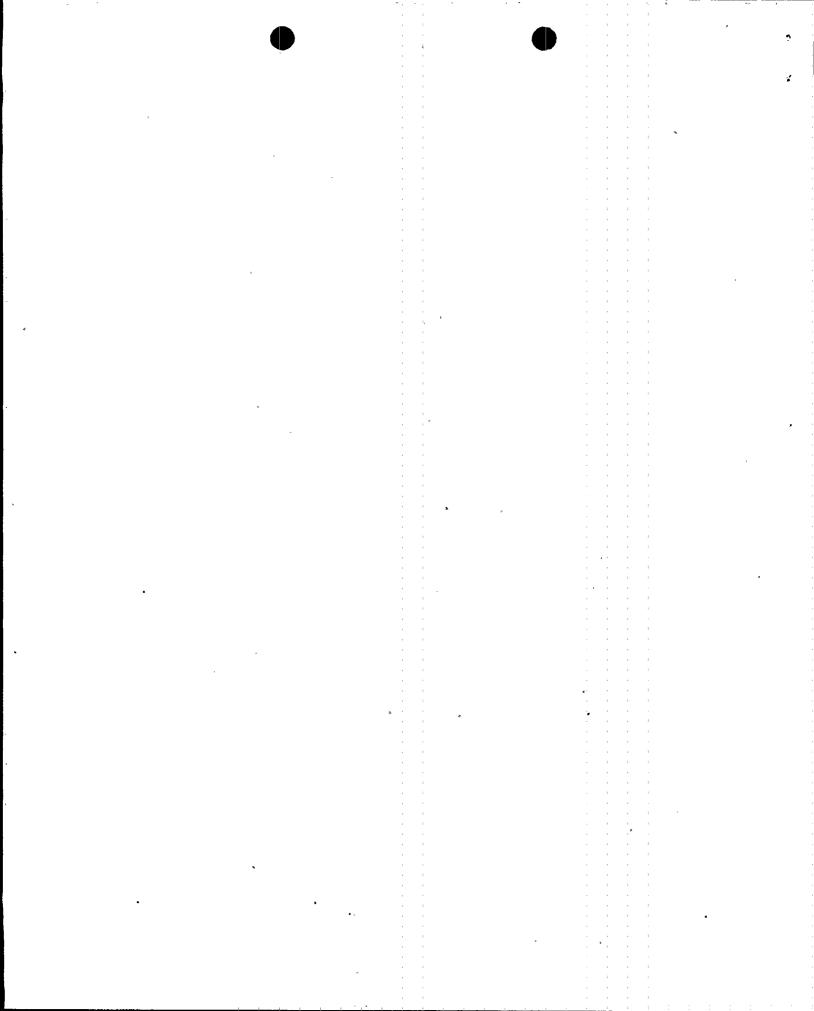
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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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Browns Ferry Nuclear Plant - Unit 2					
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

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.

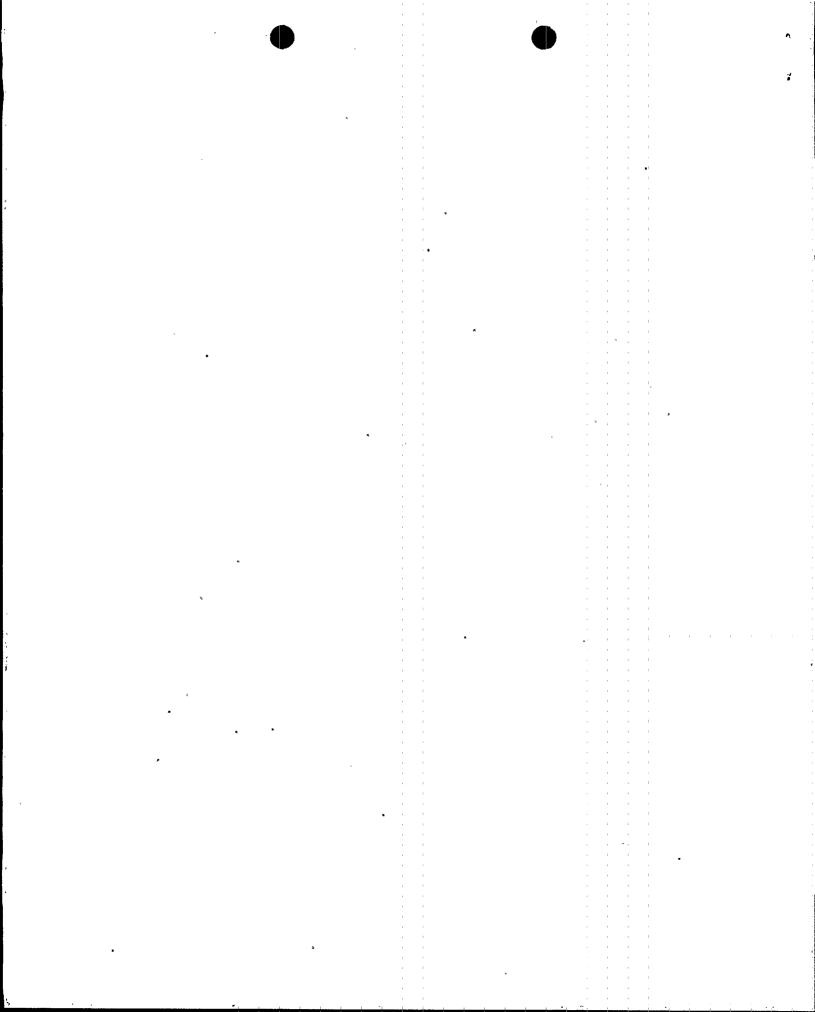
B. Root Cause

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,

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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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