

## LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)

Watts Bar Nuclear Plant - Unit 1

DOCKET NUMBER (2)

05000390

PAGE (3)

1 OF 8

TITLE (4)

Technical Specification required entry into LCO 3.0.3

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
08	25	1998	1998	003	00	09	25	1998	FACILITY NAME	DOCKET NUMBER
										05000
									FACILITY NAME	DOCKET NUMBER
										05000
OPERATING MODE (9)		1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)							
POWER LEVEL (10)		100	20.2201(b)		20.2203(a)(2)(v)		<input checked="" type="checkbox"/>		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
			20.2203(a)(2)(iv)		50.36(c)(2)				50.73(a)(2)(vii)	or in NRC Form 366A

## LICENSEE CONTACT FOR THIS LER (12)

NAME

Jerry L. Bushnell, Licensing Engineer

TELEPHONE NUMBER (Include Area Code)

(423)-365-8048

## 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)

YES

(If yes, complete EXPECTED SUBMISSION DATE).

☒ NO

EXPECTED

SUBMISSION  
DATE (15)

MONTH

DAY

YEAR

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

During the performance of Surveillance Instruction (SI) 0-SI-31-31-B, Train B of the Control Room Emergency Air Temperature Control System (CREATCS) is in operation. The control switch in the main control room for Train A of CREATCS is placed in the "pull-to-lock stop" position to ensure that both trains will not operate simultaneously. With Train A in this configuration, Action A for limiting condition for operation (LCO) 3.7.11, "CREATCS," is entered. To test the B Train, 0-SI-31-31-B requires that transfer switch, 0-XS-31-11-B, be placed in the in the "Appendix R" position. This position provides a secondary power supply to the control circuit for Train B of CREATCS. The expected results of this action is that Train B of CREATCS will continue to operate. However, at approximately 15:47 EDT during the performance of 0-SI-31-31-B, power to Train B of CREATCS was lost and the system shutdown. Since the control switch for Train A was in the pull-to-lock stop position, the shutdown of Train B resulted in both trains being inoperable. In this condition, Action E of LCO 3.7.11 requires entry into LCO 3.0.3. Train A of CREATCS was placed in service at approximately 15:53 EDT and LCO 3.7.11 for Train A along with LCO 3.0.3 were exited. Train B of CREATCS remained in Action A of LCO 3.7.11. The immediate action taken included the revision of 0-SI-31-31-B and the retesting of 0-XS-31-11-B. The planned recurrence controls include the training of involved personnel. Additional corrective measures include the testing of the Train B motor; the revision of the Fire Protection Report (FPR), the revision of the SIs to reflect the FPR requirements.

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LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION	
Watts Bar Nuclear Plant, Unit 1	05000				2 OF 8
	05000390	1998 - 003 - 00			

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

## I. PLANT CONDITIONS:

On August 25, 1998, at 1530 EDT, the plant was in Mode 1, Reactor Coolant System (RCS) (EHS AB) average temperature was 586.9° F, RCS pressure was 2229.8 psig.

## II. DESCRIPTION OF EVENT

A. Event

A 1997 Problem Evaluation Report (PER) (WBPER970777) documented a condition where the cabling for the primary control circuits for Train A and Train B of the Control Room Emergency Air Temperature Control System (CREATCS) are routed in a common area of the Auxiliary Building. In this configuration, damage to both trains of the cables during a fire is possible. The corrective action for WBPER970777 included the installation of a secondary means of powering CREATCS which is controlled by transfer switches located on the 480V power board supplying each train. A performance of Surveillance Instruction (SI) 0-SI-31-31-B, "Control Room Emergency Air Temperature Control System (CREATCS) Train B Operability Test," was initiated on August 25, 1998, to test the Appendix R circuit. During the performance of this SI, the system is setup so that Train B of CREATCS is in operation. The control switch in the main control room for Train A of CREATCS is placed in the "pull-to-lock stop" position to ensure that both trains will not operate simultaneously. With Train A in this configuration, Action A for Limiting condition for operation (LCO) 3.7.11, "CREATCS," is entered.

0-SI-31-31-B requires for Train B of CREATCS, that transfer switch, 0-XS-31-11-B, be placed in the "Appendix R" position. This position provides the secondary power supply to the control circuit for Train B of CREATCS. The expected results of this action is that Train B of CREATCS will continue to operate. However, at approximately 15:47 EDT during the performance of 0-SI-31-31-B, power to Train B of CREATCS was lost when the supply breaker tripped due to overload current allowing the system to shutdown. Since the control switch for Train A was in the "pull-to-lock stop" position, the shutdown of Train B resulted in both trains being inoperable. In this condition, Action E of LCO 3.7.11 requires entry into LCO 3.0.3. In accordance with Revision 1 of NUREG 1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73, "entry into LCO 3.0.3 is reportable under 10 CFR 50.73(a)(2)(i)(B) as an operation or condition prohibited by the plant's Technical Specifications. Train A of CREATCS was placed in service at approximately 15:53 EDT and LCO 3.7.11 for Train A was exited. LCO 3.0.3 was also exited at this time. The duration of LCO 3.0.3 condition was approximately six minutes.

Problem Evaluation Report (PER) WBPER980971 was initiated to document this event in the TVA Corrective Action Program.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
Watts Bar Nuclear Plant, Unit 1	05000	YEAR	SEQUENTIAL NUMBER	REVISION	3 OF 8
	05000390	1998 - 003 - 00			

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

## II. DESCRIPTION OF EVENT (continued)

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

There were no structures, components, or systems inoperable at the start of the event that contributed to the event.

C. Dates and Approximate Times of Major Occurrences

Time (EDT)	Occurrences on August 25, 1998
15:30	Operations personnel conducted a briefing prior to initiating performance of 0-SI-31-31-B. Included in the briefing was a discussion of the actions to be taken if Train B of CREATCS were to shutdown.
15:35	Operations personnel enter Action A of LCO 3.7.11 upon placing the main control room handswitch for Train A of CREATCS in "pull-to-lock stop."
15:47	Train B of CREATCS shuts down during the manipulation of transfer switch 0-XS-31-11-B. Action E of LCO 3.7.11 was entered which required entry into LCO 3.0.3.
15:53	Train A of CREATCS is placed in service. LCO 3.0.3 is also exited along with LCO 3.7.11 for Train A of CREATCS. Train B of CREATCS remains in Action A of LCO 3.7.11.
Time (EDT)	Occurrences on August 26, 1998
07:00	LCO 3.7.11 is exited for Train B of CREATCS.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION	
Watts Bar Nuclear Plant, Unit 1	05000				4 OF 8
	05000390		1998 - 003 - 00		

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

## II. DESCRIPTION OF EVENT (continued)

D. Other Systems or Secondary Functions Affected

No other systems or secondary functions were affected by this event.

E. Method of Discovery

Operations personnel involved in the performance of O-SI-31-31-B had discussed the possibility of Train B of CREATCS shutting down during the manipulation of the transfer switch and were monitoring for this to occur.

F. Operator Actions

The actions taken by Operations personnel related to this event are discussed in Item C, "Dates and Approximate Times of Major Occurrences," of this Section.

G. Automatic and manual safety system responses

There were no automatic or manual safety system responses and none were required.

## III. CAUSE OF EVENT

The Appendix R transfer switch, O-XS-31-11-B, has a break-before-make contact design to provide electrical separation during switch operation. In accordance with Revision 2 of O-SI-31-31-B, the operation of O-XS-31-11-B opened and closed the motor breaker for Train B of CREATCS. This caused the motor breaker to trip on overload due to the out of phase condition between the motor windings residual voltage and current and the 480V supply board's voltage and current. In a condition like this, currents of up to twice the locked rotor current of the motor could be achieved.

The post modification testing performed after the initial installation of the transfer switch removed the thermal overloads from the starter to the motor breaker. In this configuration the placement of the transfer switch into the "Appendix R" position permitted the motor breaker to close without starting the motor. The test sequence outlined in Revision 2 of O-SI-31-31-B was changed from the post modification test methodology to simplify the switch test by eliminating the need to remove and install thermal overloads at the motor breaker or transfer CREATCS operation from one train to the other and back. The personnel responsible for preparation and review of O-SI-31-31-B were not aware of the potential to overload trip the motor breaker during operation of the transfer switch. In addition, the performance of Revision 2 of O-SI-31-31-B which caused Train B to shutdown was the first time Revision 2 of O-SI-31-31-B had been performed.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION	
Watts Bar Nuclear Plant, Unit 1	05000				5 OF 8
	05000390	1998 - 003 - 00			

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

## IV. ANALYSIS OF EVENT - ASSESSMENT OF SAFETY CONSEQUENCES

The CREATCS system is designed to maintain acceptable temperatures in the MCR Habitability Zone on Elevation 755. This includes the MCR, relay room, technical support center, and mechanical equipment room. This safety-related system is designed to maintain the temperatures in the areas served for personnel access and habitability, and for the protection and reliable operation of plant controls and equipment during normal, accident, and postaccident recovery conditions. Revision 30 of Calculation WBN-OSG4-031, "Equipment Required for Safe Shutdown Per 10 CFR 50 Appendix R," documents an evaluation which determines the time required for the MCR to reach 104° F if both trains of CREATCS have failed. Based on this evaluation, both trains of the CREATCS can be out-of-service for at least 15 minutes before the temperature reaches an unacceptable level. Since this evaluation is analogous to the situation that occurred during the performance of O-SI-31-31-B, there was no impact on safety-related equipment served by the CREATCS during the six minute period the equipment was out-of-service. Further, as discussed previously, Operations personnel anticipated the possibility of the CREATCS motor tripping, and had prepared for this contingency in the pre-test briefing.

The operation of the transfer switch during an actual fire safe shutdown event will not cause CREATCS to fail like that experienced during the performance of O-SI-31-31-B. Abnormal Operating Instruction (AOI) 30.2, "Fire Safe Shutdown," requires that both trains of CREATCS be shutdown prior to placing transfer switch O-XS-31-11-B in the Appendix R position. Therefore the over current condition experienced by the cycling of the motor breaker will not occur.

## V. CORRECTIVE ACTIONS

A. Immediate Corrective Actions

1. The immediate response by operations personnel was the placement of Train A of CREATCS into service. This allowed LCO 3.0.3 to be exited. Train B of CREATCS remained in Action A of LCO 3.7.11.
2. Troubleshooting was performed on Appendix R transfer switch, O-XS-31-11-B. This inspection verified that the transfer switch contacts operated as break-before-make contacts.
3. Motor breaker O-BKR-31-11-B was verified to have tripped on overload and troubleshooting was performed on the motor breaker. The breaker rotary handle linkage was adjusted to permit resetting the breaker. No other problems were identified.
4. The SI for Train A of CREATCS, O-SI-31-31-A, "Control Room Emergency Air Temperature Control System (CREATCS) Train A Operability Test," was placed on administrative hold due to testing methodology being similar to that contained in O-SI-31-31-B.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION	
Watts Bar Nuclear Plant, Unit 1	05000				6 OF 8
	05000390		1998 - 003 - 00		

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

## V. CORRECTIVE ACTIONS (continued)

A. Immediate Corrective Actions (continued)

5. Revision 3 to O-SI-31-31-B was issued on September 3, 1998, to change the testing methodology for transfer switch O-XS-31-11-B of Train B of CREATCS. This revision made the testing similar to the test used for the initial installation of the Appendix R transfer switch.
6. Transfer switch O-XS-31-11-B was tested in accordance with Revision 3 of O-SI-31-31-B on September 4, 1998.

B. Corrective Actions to Prevent Recurrence

1. Training will be provided to System Engineering, Operations Support and Work Control personnel regarding the lessons learned from LER 390/98003.
2. Initial training programs for Operations and Engineering Support programs will be revised to include LER 390/98003.

Implementation of the above two corrective actions will occur by January 29, 1999.

C. Additional Corrective Actions\*

Due to the breaker controlling Train B of CREATCS tripping on over current, a bridge test and megger of the motor will be performed. Further, Table 3.2, "Safe Shutdown Equipment List," of the Fire Protection Report (FPR) lists the equipment required for a Fire Safe Shutdown (FSSD) and includes Train A and B CREATCS components that are tested in accordance with Surveillance Requirement (SR) 3.7.11.1. FSSD components that are not equipment controlled by the Technical Specifications or Technical Requirements Manual surveillance requirements are listed in Table 14.10, "Safe Shutdown Equipment," so that appropriate testing and inspection requirements can be developed. However, testing requirements for transfer switches O-XS-31-11-B and O-XS-31-12-A were not defined by SR 3.7.11.1 or as testing and inspection requirements for FPR Table 14.10 equipment. Therefore, Table 14.10 of the Fire Protection Report will be updated to include testing requirements for transfer switches O-XS-31-11-B and O-XS-31-12-A. Appropriate revisions to O-SI-31-31-A and O-SI-31-31-B will be made to reflect the testing requirements contained in the Fire Protection Plan. The revised procedures will be scheduled and performed as required to support the 18 month frequency of the SIs.

- \* TVA does not consider this information to constitute a regulatory commitment. TVA's Corrective Action Program will track completion of the required actions.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION	
Watts Bar Nuclear Plant, Unit 1	05000				7 OF 8
	05000390		1998 - 003 - 00		

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

## VI. ADDITIONAL INFORMATION

A. Failed Components1. Safety Train Inoperability

The cause of LER 390/98003 was not due to a component failure that rendered a train or a safety system inoperable.

2. Component/System Failure Information

## a. Method of Discovery of Each Component or System Failure:

There were no component failures involved.

## b. Failure Mode, Mechanism, and Effect of Each Failed Component:

There were no component failures involved.

## c. Root Cause of Failure:

There were no component failures involved.

## d. For Failed Components With Multiple Functions, List of Systems or Secondary Functions Affected:

There were no component failures involved.

## e. Manufacturer and Model Number of Each Failed Component:

There were no component failures involved.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION	
Watts Bar Nuclear Plant, Unit 1	05000				8 OF 8
	05000390		1998 - 003 - 00		

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

B. Previous Similar Events

LER 390/96021 and LER 390/97009 both report conditions where the main control room handswitches for both trains of CREATCS were placed in the pull-to-lock position at the same time. The cause of both of these LERs was procedural and personnel errors related to the swapover from Train A to B of CREATCS or the startup of a particular train of CREATCS. LER 390/98003 is also attributed to procedural and personnel errors. However, the problems documented in LER 390/98003 associated with the testing O-XS-31-11-B are not related to the problems documented in the previous LERs.

## VII. COMMITMENTS

The actions committed to be implemented in response to this event are tabulated in Section V, Corrective Actions.