

**LICENSEE EVENT REPORT (LER)**

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 60.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-8 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20565-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20803.

<b>FACILITY NAME (1)</b> Watts Bar Nuclear Plant - Unit 1	<b>DOCKET NUMBER (2)</b> 05000390	<b>PAGE (3)</b> 1 OF 10
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**TITLE (4)**  
INCOMPLETE SURVEILLANCE INSTRUCTION

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
04	28	97	97	011	00	05	23	97		05000
										05000

<b>OPERATING MODE (9)</b> 1	<b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)</b>									
<b>POWER LEVEL (10)</b> 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					
	20.2203(a)(2)(iv)	50.36(c)(2)		50.73(a)(2)(vii)	per NRC Form 366A					

**LICENSEE CONTACT FOR THIS LER (12)**

<b>NAME</b> R. M. Brown, Licensing Engineer	<b>TELEPHONE NUMBER (Include Area Code)</b> (423)-365-8195
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**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	BE	HS	W120	N					

<b>SUPPLEMENTAL REPORT EXPECTED (14)</b> YES (If yes, complete EXPECTED SUBMISSION DATE).	<input checked="" type="checkbox"/> NO	<b>EXPECTED SUBMISSION DATE (15)</b>	MONTH	DAY	YEAR
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**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)**

The purpose of this LER is to report findings in accordance with 10 CFR 50.73 associated with Generic Letter (GL) 96-01, "Testing of Safety Related Logic Circuits" reviews. GL 96-01 requires each licensee to compare electrical schematic drawings and logic diagrams for the Reactor Protection System, Emergency Diesel Generator load shedding and sequencing, and actuation logic for the Engineered Safety Feature Actuation System (ESFAS) against plant surveillance test procedures to ensure that all portions of the logic circuitry including the parallel logic, interlocks, bypasses and inhibit circuits, are adequately covered in the surveillance procedures to fulfill the Watts Bar Technical Specification requirements. The first surveillance deficiencies identified involved unverified parallel circuit paths and were discovered on April 28, 1997. Some additional findings have been discovered since April 28 and have been included in the report. The cause of the surveillance instruction deficiencies have been attributed to inadequate technical reviews. Corrective actions consist of completing the reviews, addressing verification of any unverified logic circuits, informing technical reviewers of the requirements of GL 96-01, and correcting any hardware deficiencies found.

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I. PLANT CONDITIONS:

Watts Bar Nuclear Plant Unit 1 has been operating in Mode 1 at approximately 100 percent rated thermal power (RPT) under the subject LER conditions.

II. DESCRIPTION OF EVENT

A. Event

The purpose of this LER is to report findings in accordance with 10 CFR 50.73 associated with Generic Letter (GL) 96-01, "Testing of Safety Related Logic Circuits" reviews. GL 96-01 requires each licensee to compare electrical schematic drawings and logic diagrams for the Reactor Protection System (Energy Industry Identification System (EIS) code JC/JG), Emergency Diesel Generator (EIS code EK) load shedding and sequencing, and actuation logic for the Engineered Safety Feature Actuation System (ESFAS) (EIS code JE) against plant surveillance test procedures to ensure that all portions of the logic circuitry including the parallel logic, interlocks, bypasses and inhibit circuits, are adequately covered in the surveillance procedures to fulfill the Technical Specification (TS) requirements. It was established to address industry problems with testing of safety related logic circuits. TVA's letter to NRC dated April 18, 1996, indicated that WBN GL 96-01 reviews would be completed by startup after the first refueling outage currently scheduled to begin in September 1997. As a result of ongoing reviews, the first reportable GL 96-01 findings were identified on April 28, 1997. The findings have been listed in Section II.C by the date of discovery. If additional GL 96-01 reportable findings are discovered, TVA will supplement the subject LER.

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

None

C. Dates of Discovery and Reportable Findings

Each finding is listed in a table by the date of discovery. Any additional findings will be added to the table list in supplemental reports until the GL 96-01 review is complete.

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II. DESCRIPTION OF EVENT (continued)

C. Dates of Discovery and Reportable Finding

Item	Date of Discovery	Incomplete Procedures	Test Deficiency
1	4/28/97	1-SI-99-5	<p>The surveillance instruction did not verify that the manual handswitches for Phase A Containment Isolation (EIS code JM), Containment Vent Isolation (EIS code JM), and Containment Spray (EIS code BE) functioned properly. The trip actuating device operational test (TADOT) to satisfy SR 3.3.2.8 and SR 3.3.6.6 was incomplete. Specifically, the procedure did not include:</p> <ol style="list-style-type: none"> <li>(1) Verification that 1-HS-30-63A successfully initiates Containment Isolation Phase A and Containment Vent Isolation to Train A and Train B of the Solid State Protection System (SSPS) (EIS code JC/JG).</li> <li>(2) Verification that 1-HS-30-63B successfully initiates Containment Isolation Phase A and Containment Vent Isolation to Train A and Train B of SSPS.</li> </ol> <p>(For items 1 and 2 above, simultaneous action of handswitches as performed in the surveillance instruction did not verify operability of each switch because Containment Isolation Phase A and Containment Vent Isolation manual signals occur through parallel logic circuit paths.)</p> <ol style="list-style-type: none"> <li>(3) Verification that 1-HS-30-64A in combination with 1-HS-30-64B successfully initiates a Containment Spray signal to Train A and Train B of SSPS.</li> <li>(4) Verification that 1-HS-30-68A in combination with 1-HS-30-68B successfully initiates a Containment Spray signal to Train A and Train B of SSPS.</li> </ol> <p>(For items 3 and 4 above, Containment Spray initiation as performed in the surveillance instruction did not verify operability of each switch because Containment Spray and Containment Isolation Phase B signals occur through parallel circuit paths.</p>

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II. DESCRIPTION OF EVENT (continued)

Item 1 (continued)

Applicable LCOs

LCO 3.3.2 The ESFAS instrumentation for each function in Technical Specification (TS) Table 3.3.2-1, "Engineered Safety Feature Actuation Instrumentation," shall be operable.

LCO 3.3.6 The containment vent isolation instrumentation for each function in TS Table 3.3.6-1, "Containment Vent Isolation Instrumentation," shall be operable.

A continuity problem was encountered during the testing of 1-HS-30-68A (EIS code HS). Entry into LCO 3.0.3 was required briefly because the manual handswitch circuits were not restored to service within 24 hours after discovery (SR 3.0.3) of the missed surveillance. A 20 minute delay beyond the 24 hours was encountered during restoration of the switch operability. Handswitch 1-HS-30-68A was replaced. All four listed handswitch functions were verified and returned to operable status.

Item	Date of Discovery	Incomplete Procedures	Test Deficiency
2	5/1/97	1-SI-92-41 1-SI-92-42 1-SI-92-43 1-SI-92-44 1-SI-92-141 1-SI-92-142 1-SI-92-143 1-SI-92-144	There was no verification in surveillance instructions that indicated the Power Range Protection (P-10) interlock (EIS code IEL) was in the required state for existing unit conditions. Thus, the channel operability test (COT) to satisfy SR 3.3.1.7 was incomplete.

Applicable LCO

LCO 3.3.1 RTS instrumentation for each function in TS Table 3.3.1-1, "Reactor Trip System Instrumentation," shall be operable.

Plant Engineering Data System (PEDS) (EIS code ID) archive data indicated that the P-10 interlock (EIS code IEL) was in the required state for existing unit conditions at the time of the channel operational test (COT) for SR 3.3.1.7.

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II. DESCRIPTION OF EVENT (continued)

Item	Date of Discovery	Incomplete Procedures	Test Deficiency
3	5/1/97	1-SI-92-131 1-SI-92-132	There was no verification in surveillance instructions to indicate the Intermediate Range Neutron Flux (P-6) interlock (EIS code IEL) was in the required state for existing unit conditions during performance of the COT. Thus, the COT to satisfy SR 3.3.1.8 was incomplete.
<p><u>Applicable LCO</u> (Applicable to items 3, 4, and 5 respectively) LCO 3.3.1 RTS (EIS code JC/JG) instrumentation for each function in TS Table 3.3.1-1, "Reactor Trip System Instrumentation," shall be operable.</p> <p>PEDS (EIS code ID) computer point archive data indicated the P-6 interlock (EIS code IEL) was in the required state for existing unit conditions at the time of the previous COT for SR 3.3.1.8.</p>			

Item	Date of Discovery	Incomplete Procedures	Test Deficiency
4	5/1/97	1-SI-92-31 1-SI-92-32 1-SI-92-131 1-SI-92-132	There was insufficient testing in surveillance instructions to completely demonstrate Intermediate Range Neutron Flux, and Source Range Neutron Flux in the COT and channel calibration respectively to satisfy SR 3.3.1.8 and 3.3.1.11. Surveillance instructions did not completely verify Source Range Channel I high flux reactor trip, Source Range Channel II high flux reactor trip, Intermediate Range Channel I high flux reactor trip, Intermediate Range Channel II high flux reactor trip, Intermediate Range Channel I P-6 interlock, and Intermediate Range Channel II P-6 interlock. Thus, it was not conclusively demonstrated that Train B of the SSPS input relays (EIS code RLY) for Intermediate Range Neutron Flux, and Source Range Neutron Flux were verified as required by SR 3.3.1.8 and 3.3.1.11.
<p>PEDS (EIS code ID) computer point archive data from the previous COT performance indicated the correct state change for Source Range, Intermediate Range, and P-6 outputs. Emergency Response Facility Data System (ERFDS) (EIS code ID) data from April 24, 1997, during the performance of 1-SI-92-131 demonstrated that the SSPS Train B input relay operated.</p>			

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II. DESCRIPTION OF EVENT (continued)

Item	Date of Discovery	Incomplete Procedures	Test Deficiency
5	5/1/97	1-SI-47-28 1-SI-47-30 1-SI-47-32 1-SI-47-34 1-SI-47-73 1-SI-47-74 1-SI-47-75	There was insufficient testing in the Channel Calibration / Trip Actuating Device Operational Test surveillance instructions for Turbine Trip Low Fluid Oil Pressure (EIS code IT/TA), and Turbine Trip Turbine Stop Valve Closure (EIS code IT/TA) to completely demonstrate verification to satisfy SR 3.3.1.10 and 3.3.1.14. The test methodology used in these instructions did not conclusively demonstrate verification of the subject inputs to Train B SSPS.

Archived computer data from PEDS (EIS code ID) indicates that during the last performance of the subject instructions the plant process computer received the proper signals, thus indicating that Train B SSPS received the proper signals.

Item	Date of Discovery	Incomplete Procedures	Test Deficiency
6	5-9-97	1-SI-99-300-A 1-SI-99-300-B	<p>The Volume Control Tank (VCT) (EIS code CB/TK) to Refueling Water Storage Tank (RWST) (EIS code CA/TK) swapper of the Centrifugal Charging Pump (CCP) (EIS code CB/P) suction was not conclusively determined to occur via the safety related interlock.</p> <p>There was insufficient testing in surveillance instructions to verify that 1-LCV-62-135-A (EIS code LCV) provided the close interlock signal to 1-LCV-62-132-A.</p> <p>There was insufficient testing in surveillance instructions to verify that 1-LCV-62-136-B provided the close interlock signal to 1-LCV-62-133-B.</p> <p>Thus, it was not conclusively demonstrated that the VCT to RWST swapper of the CCP suction was completely tested to satisfy SR 3.3.2.7.</p>

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II. DESCRIPTION OF EVENT (continued)

Item 6 (continued)

Applicable LCO

LCO 3.3.2 - ESFAS (EIS code JE) for each function in TS Table 3.3.2-1 shall be operable.

1-SI-99-603-A response time test of slave relay K603A was reviewed and it was determined that 1-LCV-62-135-A provided the closed interlock for 1-LCV-62-132-A. PEDS data for the March 6, 1997, inadvertent safety injection was reviewed and it was determined that 1-LCV-62-136-B initiated the closing of 1-LCV-62-133-B. Since acceptable documentation/data has been extracted from 1-SI-99-603-A and also from the March 6, 1997, inadvertent Train B safety injection, the VCT to RWST swapover is considered to be satisfactorily tested.

II. DESCRIPTION OF EVENT (continued)

D. Other Systems or Secondary Functions Affected

No other systems or secondary functions were affected.

E. Method of Discovery

GL 96-01 reviews.

F. Operator Actions

Entry into applicable TS actions upon notification as applicable.

G. Automatic and manual safety system responses

No automatic or manual safety system responses have been associated with the subject LER.

III. CAUSE OF EVENT

The cause of this event has been attributed to inadequate technical reviews similar in nature to the GL 96-01 issues.

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IV. ANALYSIS OF EVENT - ASSESSMENT OF SAFETY CONSEQUENCES

There was no safety significance for the circuits identified in the subject LER that were successfully tested or verified and documented as being operable by alternate means.

1-HS-30-68A (EIS code HS)

There was no decrease in nuclear safety associated with the inoperability of handswitch 1-HS-30-68A. The continuity problem encountered during testing indicated that the circuit involving 1-HS-30-68A in combination with 1-HS-30-68B required to successfully initiate a Containment Spray signal to Train A and Train B of SSPS was not functional. However, manual initiation is not credited in any accident events analyzed in the Safety Analysis Report (SAR). Therefore, the consequence of failure of 1-HS-30-68A does not represent a decrease in nuclear safety.

Redundant manual initiation switches are also provided in the control room (1-HS-30-64A and 1-HS-30-64B). In addition, capability for manual initiation of Containment Spray is provided at the system level via control room operation of the Containment Spray header isolation valves and Containment Spray pumps.

V. CORRECTIVE ACTIONS

A. Immediate Corrective Actions

Item 1:

A test procedure was written and the logic circuits listed under item 1 were tested. Handswitch 1-HS-30-68A contacts were found unacceptable. Work Order 97007350-01 replaced the handswitch.

B. Corrective Actions to Prevent Recurrence

In accordance with the schedule provided in TVA's letter to NRC dated April 18, 1996, technical reviews are being performed to compare electrical schematic drawings and logic diagrams for the Reactor Protections System (EIS code JC/JG), Emergency Diesel Generator (EIS code EK) load shedding and sequencing, and actuation logic for Engineered Safety Feature Actuation Systems (EIS code JE) against plant surveillance test procedures to ensure that all portions of the logic circuitry including the parallel logic, interlocks, bypasses, and inhibit circuits are adequately covered in the surveillance procedures to fulfill the TS requirements. The review includes relay contacts, control switches, and other relevant electrical components within these systems, utilized in the logic circuits performing a safety function.

Upon discovery of questionable items, the conditions have been determined to be valid or invalid.

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V. CORRECTIVE ACTIONS (continued)

Historical data including PEDS (EIS code ID), ERFDS (EIS code ID), and startup test data have been reviewed to determine if questionable logic circuits can be verified by alternate means. Records have been generated to document acceptance of alternate data in lieu of test verification documentation.

In the absence of acceptable verification documentation, the unverified circuit logic paths have been verified via testing.

Incomplete procedures will be revised prior to their next use or prior to restart of the first refueling outage (whichever comes first).

The appropriate Technical Reviewers will be informed of the requirements of GL 96-01 prior to restart of the first refueling outage.

The first refueling outage is currently scheduled for September 1997.

VI. ADDITIONAL INFORMATION

A. Failed Components

1. Safety Train Inoperability

Item 1:

An inoperable condition existed for handswitch 1-HS-30-68A in combination with 1-HS-30-68B to successfully initiate a Containment Spray signal to Train A and Train B of SSPS. Manual initiation of these two switches to initiate a Containment Spray signal is not credited in any accident event analyzed in the Safety Analysis Report (SAR).

2. Component/System Failure Information

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

Item 1:

Work Order 97007350-01 found dirty and intermittent contacts on 1-HS-30-68A (EIS code HS).

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

Item 1:

Switch contacts were intermittent.

c. Root Cause of Failure:

Item 1:

Dirt was observed on the switch contacts.

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VI. ADDITIONAL INFORMATION (continued)

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

There were no component failures of this nature.

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

Item 1:  
Westinghouse type W-2

B. Previous Similar Event

The subject LER is bounded by the findings of GL 96-01 reviews. GL 96-01 findings will be supplemented by the subject LER until the reviews are complete.

VII. COMMITMENTS

1. The appropriate Technical Reviewers will be informed of the requirements of GL 96-01 prior to restart of the first refueling outage.
2. Incomplete procedures will be revised prior to their next use or prior to restart of the first refueling outage (whichever comes first).