Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381

JAN 1 2 1996

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of) Docket Nos. 50-390
Tennessee Valley Authority)

WATTS BAR NUCLEAR PLANT (WBN) - UNIT 1 - FACILITY OPERATING LICENSE NPF-20 - LICENSEE EVENT REPORT (LER) 50-390/95002

The enclosed report provides details regarding a failure to identify equipment conditions which exceeded specified limits. Submittal of the report is in accordance with 10 CFR 50.73(a)(2)(i).

Sincerely,

for D. V. Kehoe
Nuclear Assurance
and Licensing Manager

Enclosure
cc: See page 2

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JAN 1 2 1996

cc (Enclosure):
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NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 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-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20603.

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Watts Bar Nuclear Plant - Unit 1	05000390	1 OF 8

TITLE (4)

Failure To Comply With Technical Specifications for 480 Volt Shutdown Board Voltages Which Exceed Acceptance Criteria

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
										05000
12	10	95	95	95-002	00	01	12	96	FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	5
POWER LEVEL (10)	00

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

	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
	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	TELEPHONE NUMBER (Include Area Code)
Charles W. Touchstone, Regulatory Licensing Engineer	(423)-365-3820

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)

Technical Specification Surveillance Requirement (SR) 3.8.10.1, requires in part, verification of correct voltage to required AC bus electrical power distribution subsystems every seven days while in Modes 5 and 6. On December 13, 1995, at approximately 1115 hours (EST), Operations personnel identified that SR 3.8.10.1, as implemented by Surveillance Instruction (SI) 0-SI-0-3, "Weekly Log," had not been adequately satisfied on December 10, 1995, at approximately 0130 hours (EST), for four of the eight 480 Volt Shutdown Boards (SDBDs). Voltage levels of 510 volts had been recorded for the four SDBDs but were not recognized as failing to meet the acceptance criteria of 440V to 508V. During this time period, Unit 1 was in Mode 5 preparing for Mode 4 entry following initial core load. Evaluation of this voltage condition determined there was no adverse impact on plant equipment or on the ability of the electrical power system to fulfill its required functions. The cause for the event was insufficient attention to detail and lack of self-checking by the performer and reviewers of the surveillance instruction. Corrective measures include counseling and disciplinary action for the involved personnel, briefings with licensed and unlicensed Operations shift personnel, and reviews of other surveillances for similar occurrences.

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

I. PLANT CONDITIONS

At 1950 hours (EST) on December 9, 1995, Watts Bar Unit 1 was in Mode 5 at the beginning of Cycle 1, preparing for initial entry to Mode 4 during the early phase of the Power Ascension Test Program. The primary plant was at 96°F and 29 psig (water solid), with reactor coolant system (RCS) (AB) boron concentration of 2015 ppm. The voltage for the four subject 480V SDBDs (ECBD/ED) was recorded at approximately 0137 hours (EST) on December 10, 1995. The event was discovered at approximately 1115 hours, December 13, 1995, with Unit 1 in Mode 5. Plant conditions at 0800 hours (EST) on December 13, 1995, were that Unit 1 was in Mode 5 with the primary plant at 175°F and 348 psig, with RCS boron concentration of 2022 ppm.

II. DESCRIPTION OF EVENT

A. Event

Surveillance Requirement 3.8.10.1, requires verification of correct breaker alignment and voltage to required AC, vital DC, and AC vital bus electrical power distribution subsystems every seven days while in Modes 5 and 6 and during movement of irradiated fuel assemblies. WBN Surveillance Instruction 0-SI-0-3 implements the requirements of SR 3.8.10.1 every seven days and specifies the required acceptance criteria (breaker positions and voltage limits) for affected equipment in Appendix A of the SI. These quantitative acceptance criteria are not defined within the WBN Unit 1 Technical Specifications. At 0120 hours (EST) on December 10, 1995, 0-SI-0-3 was authorized for performance by the Unit Senior Reactor Operator (SRO). Between 0120 hours and 0137 hours, an assigned test director (licensed unit operator, UO) recorded voltage data on the SI data sheet (Appendix A, pages 11 and 12) for 18 devices including 6.9kV SDBDs (ECBD/BD), vital battery buses (EF), and eight 480V SDBDs. Although not recognized by the UO, the voltages the UO recorded for 480V SDBDs 1A2-A, 1B2-B, 2B1-B, and 2B2-B exceeded the acceptance criteria voltage range of 440V to 508V specified on the SI data sheet. 0-SI-0-3 was completed during the following shift which began at approximately 0725 hours on December 10, 1995. On December 10, 1995, at approximately 1505 hours, the day-shift test director (licensed UO) attested that 0-SI-0-3 acceptance criteria had been met and the independent verifier (Assistant Shift Operations Supervisor (ASOS)/SRO) attested the acceptance criteria had been met at 1630 hours at which time the SI was complete. At approximately 1115 hours (EST) on December 13, 1995, during a confirmatory review of surveillance requirements in support of Mode 4 entry, an offshift SOS discovered the subject condition and notified the onshift SOS. At 1145 on December 13, 1995, the Condition and Required Actions of WBN Technical Specification LCO 3.8.10, "Distribution Systems - Shutdown," were entered and immediate actions were taken to restore the 480V SDBDs to within acceptable voltage limits. The LCO Actions were exited at 1150 hours on December 13, 1995.

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

The operability of four of eight 480V SDBDs (1A2-A, 1B2-B, 2B1-B, and 2B2-B) was indeterminate at the start of the event due to indicated voltage levels which exceeded specified limits. Although the boards were subsequently determined capable of performing their intended function, the overvoltage condition was not detected during the surveillance, resulting in failure to comply with Technical Specifications.

C. Dates and Approximate Times of Major Occurrences

November 16, 1995, 0020 hours (EST) - Unit 1 Enters Mode 5

December 10, 1995, 0120 hours (EST) - 0-SI-0-3 authorized by SRO for performance

December 10, 1995, 0137 hours (EST) - Test director (UO) completes recording of voltage data for eight 480V SDBDs. Four boards have voltages recorded as 510V which exceeds the acceptance criteria limit of 440V to 508V. This failure to meet acceptance criteria is not recognized or documented by the test director. As a result, no notifications are made to the main control room (MCR) as required by WBN procedure, Site Standard Practice (SSP) 8.02, "Surveillance Test Program." This occurrence should have resulted in declaring the affected boards inoperable and the performance of immediate actions in compliance with WBN Technical Specification LCO 3.8.10.

December 10, 1995, 1505 hours (EST) - Day-shift test director (UO) attests in SI data package that acceptance criteria for 0-SI-0-3 are satisfied. UO does not identify condition.

December 10, 1995, 1630 hours (EST) - Independent Verifier (SRO) attests in SI data package that acceptance criteria review is complete for 0-SI-0-3. SRO does not identify condition.

December 13, 1995, approximately 1115 hours (EST) - The overvoltage condition recorded for the 480V SDBDs on December 10, 1995, is discovered during a confirmatory review of surveillance requirements in support of Mode 4 entry.

December 13, 1995, 1145 hours (EST) - Technical Specification Actions for LCO 3.8.10, "Distribution Systems - Shutdown," are entered and immediate actions taken to restore the 480V SDBDs to within acceptable voltage limits. The LCO Actions were exited at 1150 hours on December 13, 1995.

D. Other Systems or Secondary Functions Affected

There were no other systems or secondary functions directly affected by the out of limit voltage condition on the four 480V SDBDs. However, in accordance with LCO 3.8.10, Required Action A.2.5, both trains of the Residual Heat Removal System (BP) were declared inoperable and LCO 3.4.7, "RCS Loops - Mode 5, Loops Filled," Condition B entered at 1145 hours on December 13, 1995. Action was immediately taken to restore the voltage for the four 480V SDBDs to within limits by decreasing the supply voltage to the 6.9kV SDBDs by placing the common station service transformer (CSST) (XFMR/FK) C and CSST D automatic load tap-changers in Manual. The Actions of LCO 3.8.10 were exited at 1150 hours on December 13, 1995.

E. Method of Discovery

The condition that four 480V SDBDs had voltages recorded in 0-SI-0-3 which were out of limit was discovered during a confirmatory review of surveillance requirements in support of Mode 4 entry at approximately 1115 hours on December 13, 1995. The condition was identified by an offshift SOS involved with the certification of readiness to enter Mode 4. The review of 0-SI-0-3 by the SOS was not required or related to the completion/approval of the SI performance.

F. Operator Actions

The actions taken by Operations personnel related to this event are discussed in Section III, Item B, and in Section V, Items A and B.

G. Automatic and Manual Safety System Response

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

III. CAUSE OF EVENT

A. Immediate Cause

The immediate cause of this event was the failure to identify a failed surveillance requirement and implement immediate actions for inoperable equipment in accordance with Technical Specifications.

B. Root Cause

The root cause of this event was personnel error. WBN licensed personnel (evening shift test director-UO, day-shift test director-UO, and independent verifier-SRO) failed to follow procedural requirements to which they had been trained by failing to identify that the recorded voltage for the four 480V SDBDs exceeded the acceptance criteria. This resulted from insufficient review and inattention to detail, and inadequate self-checking. SSP-8.01, "Conduct of Test," and SSP-8.02 "Surveillance Test Program," require a qualified test director and independent reviewer to verify and attest that acceptance criteria are satisfied and immediately notify the MCR of failure to meet any acceptance criteria which may affect the operability of affected equipment.

IV. ANALYSIS OF EVENT - ASSESSMENT OF SAFETY CONSEQUENCES

There was no adverse impact as a result of this event. The 480V SDBD voltage range in 0-SI-0-3 is provided on WBN Drawing 1-15E500-3 based on ANSI Standard C84.1-1982 nominal voltage limits. The higher voltages experienced resulted from lightly loaded 480V SDBD conditions which may occur while the 6.9kV SDBDs remain within limits. The upper limit is concerned with protection of connected loads; voltages exceeding the upper limit do not necessarily indicate the boards are incapable of performing their intended function. Although sustained overvoltage results in long term equipment degradation, the voltages and durations experienced have no adverse impact on the 480V SDBDs or the connected equipment. Specifically:

- Motors are rated at 460V, +/- 10 percent, or 506 volts. The voltage drop on the feeder is normally 14 volts, thus in the subject case the voltage expected at the motor terminals is 496V and within the 506V upper limit.

- The 510 Volts is seen at the shutdown board bus. The equipment connected to the bus includes undervoltage relay coils, indicating lights, potential transformers, breaker main contacts, and current limiting reactors. The undervoltage relay function is alarm only. Indicating lights, which are for status only, may experience a reduced life. The potential transformers and breaker main contacts are rated at 600 volts and the current limiting reactors are rated at 1200 volts.

An evaluation has determined that an allowable voltage range for the 480V SDBDs is 440V to 515V; this value has been reflected in a change to 0-SI-0-3.

Therefore, the initial conditions for Design Basis Accident and transient analyses in the FSAR which assume Engineered Safety Feature (ESF) Systems (JE) are operable, were not affected. Specifically, the ability of the AC electric power distribution system to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, the RCS, and containment design limits are not exceeded, was not impaired.

V. CORRECTIVE ACTIONS

A. Immediate Corrective Actions

1. On December 13, 1995, at 1150 hours, action was immediately taken to restore the voltage for the four 480V SDBDs to within limits by decreasing the supply voltage to the 6.9kV SDBDs by placing the CSST C and D automatic load tap-changers in Manual.

2. On December 13, 1995, the MCR evening shift personnel were notified of this event during the shift turnover meeting and informed of expectations for review of acceptance criteria.

3. On December 13, 1995, an independent review was performed of five 0-SI-0-3 data packages performed since WBN Unit 1 fuel load, including the December 10, 1995 performance. There were no other instances where the recorded data failed to meet the specified acceptance criteria. In one case however, the switch positions for four switches (IS) on vital inverter 2-I (INVT/EF) were not documented (0-SI-0-3, December 10, 1995). Based on discussions with the operator who recorded the data, the switch positions were verified on a field-copy of the data sheet but had been over-looked during transfer of the field data to the official test data package. This error was not detected by the test director or independent reviewers (same reviewers involved with this 480V SDBD event). These inverter switches are currently in the correct position.

4. On December 14, 1995, the Operations Manager, Plant Manager, and Site Vice President emphasized expectations concerning licensed activities at WBN to the Operations Staff and Shift Operations Supervisors, including discussion of this event.

5. To confirm that the personnel errors are not widespread, a sample of 43 Operation's surveillance instructions were reviewed for Technical Specification acceptance criteria. These SIs were selected to include performance and review by the individuals involved in the event but also included performance and review by other Operations personnel not involved. No additional instances were observed where data exceeding acceptance criteria limits were certified as acceptable.

B. Corrective Actions to Prevent Recurrence

6. In addition to the December 14, 1995, meeting to discuss expectations with the Operations staff (Number 4 above), Operations management discussed this event with each Operations shift crew including expectations for the prompt review of acceptance criteria during performance of surveillances. These discussions were followed-up by a written directive from the Operations Manager to Operations personnel reiterating expectations for performance of surveillances.

7. The discussion in Number 6 above was followed by issuance of Operations Standing Order SO-96-001 on January 5, 1996. The SO provides additional guidance for review of acceptance criteria in Operation's "data-taking" type surveillances such as 0-SI-0-3, and should result in more thorough and efficient procedure reviews by delegating the independent review function to any of several SROs, instead of only the Unit SRO. Each operating crew is required to review and become familiar with the SO contents /requirements prior to assuming shift responsibilities.

8. The licensed individuals involved with the out-of-limit voltage data have been counseled and disciplined. The AUO involved with data transfer for the vital inverter 2-I switch positions has also been counseled.

VI. ADDITIONAL INFORMATION

A. Failed Components

1. Safety Train Inoperability

There were no actual component or system failures related to this event. As discussed in Section IV, the ability of the 480V SDBDs to perform their required function was not impaired. The boards were deemed inoperable based on exceeding specified voltage limits which were subsequently determined to be overly-restrictive for the lightly loaded condition of the Plant at the time of the event.

2. Component/System Failure Information

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

There were no component failures involved. Refer to Item VI.A.1 above.

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

There were no component failures involved. Refer to Item VI.A.1 above.

c. Root Cause of Failure:

There were no component failures involved. Refer to Item VI.A.1 above.

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

There were no component failures involved. Refer to Item VI.A.1 above.

e. Manufacturer and Model Number of Each Failed Component:

There were no component failures involved. Refer to Item VI.A.1 above. The 480V SDBDs are Westinghouse, Type DS, Low Voltage Metal Enclosed Switchgear.

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

B. Previous Similar Events

No events similar to the events described in this report have been previously reported under 10 CFR 50.72 or 10 CFR 50.73.

Although not reportable under 10 CFR 50.73, a similar event occurred on December 31, 1995, while the plant was in Mode 3 at normal operating temperature and pressure of 557°F and 2235 psig, respectively. The event involved failure of a non-licensed operator to identify and inform the MCR of out-of-limit temperature conditions in the WBN main steam valve vaults (NF/SB). The temperature was recorded during a 12-hour temperature monitoring surveillance required by the WBN Technical Requirements Manual. Subsequent evaluation determined that operability of the main steam safety valves (RV/SB) was not affected. The analysis and specific corrective actions for this event are being addressed under the WBN Corrective Action Program, however, actions to prevent its recurrence are included within Section V.B of this report.

VII. COMMITMENTS

The actions taken in response to this event are tabulated in Section V, Corrective Actions. These actions are complete.