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

July 10, 2017

10 CFR 50.73

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Unit 1
Facility Operating License No. NPF-90
NRC Docket No. 50-390

Subject: **Licensee Event Report 390/2017-005-00, Isolation of the 1B-B Safety Injection Pump Leads to a Condition Prohibited by Technical Specifications**

This submittal provides Licensee Event Report (LER) 390/2017-005-00. This LER provides details concerning the isolation of a Safety Injection pump leading to a condition prohibited by Technical Specifications and an event that could have prevented the fulfillment of a safety function. This report is being submitted in accordance with 10 CFR 50.73(a)(2)(i)(B) and 10 CFR 50.73(a)(2)(v)(D).

There are no regulatory commitments contained in this letter. Please direct any questions concerning this matter to Kim Hulvey, WBN Licensing Manager, at (423) 365-7720.

Respectfully,

Paul Simmons
Site Vice President
Watts Bar Nuclear Plant

Enclosure
cc: See Page 2

cc (Enclosure):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Watts Bar Nuclear Plant

NRC FORM 366 (04-2017) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

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4. TITLE

Isolation of the 1B-B Safety Injection Pump Leads to Condition Prohibited by Technical Specifications

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
05	10	2017	2017	- 005	- 00	07	10	2017	N/A	05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
46	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☒ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Dean Baker, Licensing Engineer	423-452-4589

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO				

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

On May 10, 2017, at 0907 Eastern Daylight Time (EDT), Watts Bar Nuclear Plant (WBN) Unit 1 operations personnel discovered the 1B-B Safety Injection pump discharge isolation valve (1-ISV-63-527) closed. Technical Specification (TS) 3.5.2, ECCS - Operating, Condition A was immediately entered for one or more trains of the Emergency Core Cooling System (ECCS) inoperable. TS 3.5.2 Condition A was exited at 0913 EDT when 1-ISV-63-527 was opened. Investigation determined that the 1B-B SI pump discharge isolation valve had been closed prior to Unit 1 entering Mode 3 on April 26, 2017, representing a condition prohibited by TS. During this time period, the 1A-A SI pump was inoperable for 21 minutes, representing a condition that could have prevented fulfillment of a safety function.

The cause of the mispositioned valve was the result of an individual failing to follow procedure use and adherence requirements during the performance of Emergency Diesel Generator (EDG) Blackout testing. The safety injection pump discharge valve was closed to support the test but was not reopened following the testing. Corrective actions for this event include personal accountability actions, revision of the EDG blackout procedures to ensure the SI pump discharge valves are reopened, and additional station focus on procedure use, particularly use of Not Applicable (N/A) in performing procedures.

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Watts Bar Nuclear Plant, Unit 1	05000390	2017	- 005	- 00

NARRATIVE

I. PLANT OPERATING CONDITIONS BEFORE THE EVENT

Watts Bar Nuclear Plant (WBN) Unit 1 was at 46 percent rated thermal power (RTP) .

II. DESCRIPTION OF EVENT

A. Event Summary

On May 10, 2017, at 0907 Eastern Daylight Time (EDT), Watts Bar Nuclear Plant (WBN) Unit 1 operations personnel discovered the 1B-B Safety Injection (SI) {EIIS:BQ} pump discharge isolation valve {EIIS:V}(1-ISV-63-527) closed. Technical Specification (TS) 3.5.2, ECCS - Operating, Condition A was immediately entered for one or more trains of the Emergency Core Cooling System (ECCS) inoperable. TS 3.5.2 Condition A was exited at 0913 EDT when 1-ISV-63-527 was opened. Investigation determined that the 1B-B SI pump discharge isolation valve had been closed since prior to Unit 1 entering Mode 3 on April 26, 2017, representing a condition prohibited by TS. During this time period, the 1A-A SI pump was inoperable for 21 minutes, representing a loss of safety function.

This event is being reported to the Nuclear Regulatory Commission (NRC) under 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TS and under 10 CFR 50.73(a)(2)(v)(D) as an event or condition that could have prevented fulfillment of a safety function.

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

No inoperable equipment contributed to this event.

C. Dates and Approximate Times of Occurrences

Date	Time (EDT)	Event
4/11/2017		Preparations occur to perform 0-SI-82-4, 1B EDG Blackout Test, with Unit 1 in Mode 6. To prevent injection of water into the reactor coolant system, the SI pump discharge isolation valve was closed.
4/26/2017	1624	Unit 1 enters Mode 3
5/9/2017	1240	1A-A Emergency Diesel Generator (EDG) declared inoperable to check water in cylinders.
5/9/2017	1301	1A-A EDG declared operable.
5/10/2017	0907	1B-B SI pump discharge isolation valve found closed, pump declared inoperable.
5/10/2017	0913	1B-B SI pump discharge isolation valve opened, pump declared operable.

D. Manufacturer and Model Number of Components that Failed During the Event

Not applicable.

E. Other Systems or Secondary Functions Affected

No other systems or secondary functions were affected .

F. Method of discovery of each Component or System Failure or Procedural Error

This valve misposition was discovered by an operator performing routine operator rounds.

G. Failure Mode and Effect of Each Failed Component

Not applicable.

H. Operator Actions

Upon discovering valve 1-ISV-63-527 isolated, the operator promptly opened the valve.

I. Automatically and Manually Initiated Safety System Responses

Not applicable.

III. CAUSE OF THE EVENT

A. The cause of each component or system failure or personnel error, if known.

The test director for the EDG Blackout Test failed to follow procedure use and adherence requirements related to the application of Not Applicable (N/A), and did not obtain Section Manager concurrence for the use of N/A.

B. The cause(s) and circumstances for each human performance related root cause.

The test director for the EDG Blackout Test failed to follow procedure use and adherence requirements related to the application of Not Applicable (N/A), and did not obtain Section Manager concurrence for the use of N/A.

IV. ANALYSIS OF THE EVENT

On April 11, 2017, WBN Unit 1 was in Mode 6 during the Unit 1 fourteenth refueling outage (U1R14). The station was making preparations to perform 0-SI-82-4, 1B EDG Blackout Test. Blackout testing is normally conducted with the unit in Mode 5, however, due to a delay in the U1R14 schedule, the decision was made to conduct the testing in Mode 6. 0-SI-82-4 Appendix B aligns the SI System for the blackout testing to ensure that water is not inadvertently injected into the core. Section 3.1 of Appendix B accomplishes this task by ensuring that the Cold Overpressure Mitigation System (COMS) clearance is in place. Normally, a COMS clearance places a hold order on the breakers and hand switches of the system pumps with the capability to inject high pressure water into the core. Appendix B, Section 3.1, Step [2] assumes this clearance for COMS is in place. Appendix B, Section 3.1, Step [3] takes the additional step of ensuring that the 1B-B SI Pump discharge valve (1-ISV-63-527-B) is closed and tagged. This is accomplished by

verifying that the COMS clearance in Step [2] already holds 1-ISV-63-527-B closed and tagged or that the clearance is modified to include this valve.

0-SI-82-4 is written with the assumption that the unit will be in Mode 5 during the performance of the surveillance. An appendix to the procedure restores system alignment following conduct of the testing. That appendix does not contain restoration steps for 1-ISV-63-527-B because the procedure assumes configuration control for this valve is maintained under the COMS clearance. The surveillance essentially transfers responsibility for configuration control to the COMS clearance, which was not required in this case due to the test being performed in Mode 6. This lack of configuration control in 0-SI-82-4 was a latent error introduced in the procedure in 2004.

The test director recognized that the unit was in Mode 6 and that the COMS clearance was neither required nor hanging at the time of the test. 0-SI-82-4 Appendix B, Section 3.1, Step [2] and [3] were marked N/A during the preparation. Step [2] is marked with a note that states "COMS not required in Mode 6". Step [3] is marked with a note that states "Valve verified closed but not tagged. Mode 6 does not require valve to be tagged for COMS". The test director failed to follow procedure use and adherence requirements. Specifically, the Section Manager concurrence was not obtained prior to moving to the next step in the procedure. Additionally, the test director did not consider the effect of N/A on these steps with regard to configuration control. The system restoration appendix was not reviewed to ensure adequate restoration steps were in place to restore 1-ISV-63-527-B to its required open position for normal operation.

Contributing to the event, while not required, performance of an 18 month locked valve verification and a system alignment verification were waived during the outage.

V. ASSESSMENT OF SAFETY CONSEQUENCES

Both trains of SI were required to be in service to comply with TS 3.5.2 following re-entry into Mode 3 on April 26, 2017. During the time until the valve misposition was identified on May 10, 2017, the 1A-A SI was operable except for a 21 minute period when its associated EDG was inoperable while it was checked to confirm water was not present in the engine cylinders. Therefore, during this 21 minute period, both SI trains were considered inoperable. An evaluation concluded the change in core damage probability from the 1B-B SI pump being isolated for 14 days considering the brief period where the 1A-A SI pump was also unavailable, was less than 1E-7 during this time period, and the risk significance of this event was very small.

A. Availability of systems or components that could have performed the same function as the components and systems that failed during the event

The 1A-A SI pump was operable during the period in question except for a 21 minute period.

B. For events that occurred when the reactor was shut down, availability of systems or components needed to shutdown the reactor and maintain safe shutdown conditions, remove residual heat, control the release of radioactive material, or mitigate the consequences of an accident

Not applicable.

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NARRATIVE

C. For failure that rendered a train of a safety system inoperable, an estimate of the elapsed time from the discovery of the failure until the train was returned to service

The isolated 1B-B SI pump was returned to service seven minutes after discovery. The 1B-B SI pump was out of service from April 26, 2017 until May 10, 2017, or just over fourteen days.

VI. CORRECTIVE ACTIONS

This event was entered into the Tennessee Valley Authority (TVA) Corrective Action Program and is being tracked under Condition Report (CR) 1294133.

A. Immediate Corrective Actions

Upon discovering the 1B-B SI pump discharge isolation valve closed, the valve was immediately opened.

B. Corrective Actions to Prevent Recurrence or to Reduce Probability of Similar Events Occurring in the Future

The EDG blackout procedures will be revised to ensure the SI pump discharge valves are reopened at the completion of testing. Additional management focus has been applied since this event related to procedure use and adherence, particularly in the application of N/A associated with procedure use.

VII. PREVIOUS SIMILAR EVENTS AT THE SAME SITE

LER 390/2017-002 describes a condition prohibited by TS 3.6.3, Containment Isolation Valves, where a clearance was placed on the wrong fuses for a containment purge valve. This led to the purge valve not having power removed to its actuator while leak testing was being performed. While this configuration control issue was also associated with human performance (failure to identify the proper fuse location), it was not associated with procedural compliance.

LER 390/2016-002-00 describes a condition where by misinterpreting the requirements of TS 3.6.3, the containment penetration was not isolated within four hours. The event described in this LER is different in that the correct actions to comply with the TS were understood, but a human performance error resulted in the correct actions not being performed.

Concerns with procedural use and adherence are a station focus area and are described in Section VI.B of this LER.

VIII. ADDITIONAL INFORMATION

None.

IX. COMMITMENTS

None.