



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

August 19, 2019
WBL-19-040

10 CFR 50.73

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

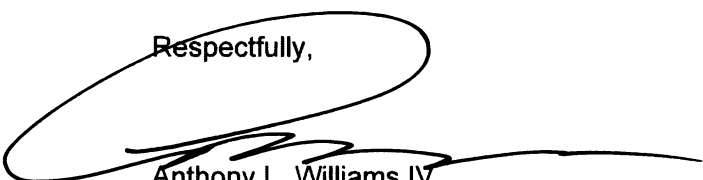
Watts Bar Nuclear Plant, Unit 2
Facility Operating License No. NPF-96
NRC Docket No. 50-391

Subject: Licensee Event Report 391/2019-002-00, Breach Due to Penetration Boot Seal Separation Results in Shield Building Inoperability

This submittal provides Licensee Event Report (LER) 391/2019-002-00. This LER provides details concerning a breach in the Watts Bar Nuclear Plant (WBN) Unit 2 Shield Building annulus in excess of allowable margin, due to a penetration boot seal that had pulled away from the shield building wall. This event is being reported to the Nuclear Regulatory Commission (NRC) as an event or condition that could have prevented fulfillment of a safety function of structures or systems that are needed to control the release of radioactive material in accordance with 10 CFR 50.73(a)(2)(v)(C).

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

Respectfully,




Anthony L. Williams IV
Site Vice President
Watts Bar Nuclear Plant

Enclosure
cc: See Page 2

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cc (Enclosure):

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

NRC FORM 366 (04-2018)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020 <small>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.</small>						
		LICENSEE EVENT REPORT (LER)									
1. Facility Name Watts Bar Nuclear Plant, Unit 2					2. Docket Number 05000391			3. Page 1 OF 5			
4. Title Breach Due to Penetration Boot Seal Separation Results in Shield Building Inoperability											
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	
06	20	2019	2019	- 002	- 00	08	19	2019	N/A	05000	
									Facility Name	Docket Number	
									NA	05000	
9. Operating Mode		11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)									
1		<input type="checkbox"/> 20.2201(b)			<input type="checkbox"/> 20.2203(a)(3)(i)			<input type="checkbox"/> 50.73(a)(2)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
		<input type="checkbox"/> 20.2201(d)			<input type="checkbox"/> 20.2203(a)(3)(ii)			<input type="checkbox"/> 50.73(a)(2)(ii)(B)		<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
		<input type="checkbox"/> 20.2203(a)(1)			<input type="checkbox"/> 20.2203(a)(4)			<input type="checkbox"/> 50.73(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(ix)(A)	
		<input type="checkbox"/> 20.2203(a)(2)(i)			<input type="checkbox"/> 50.36(c)(1)(i)(A)			<input type="checkbox"/> 50.73(a)(2)(iv)(A)		<input type="checkbox"/> 50.73(a)(2)(x)	
10. Power Level		<input type="checkbox"/> 20.2203(a)(2)(ii)			<input type="checkbox"/> 50.36(c)(1)(ii)(A)			<input type="checkbox"/> 50.73(a)(2)(v)(A)		<input type="checkbox"/> 73.71(a)(4)	
100		<input type="checkbox"/> 20.2203(a)(2)(iii)			<input type="checkbox"/> 50.36(c)(2)			<input type="checkbox"/> 50.73(a)(2)(v)(B)		<input type="checkbox"/> 73.71(a)(5)	
		<input type="checkbox"/> 20.2203(a)(2)(iv)			<input type="checkbox"/> 50.46(a)(3)(ii)			<input checked="" type="checkbox"/> 50.73(a)(2)(v)(C)		<input type="checkbox"/> 73.77(a)(1)	
		<input type="checkbox"/> 20.2203(a)(2)(v)			<input type="checkbox"/> 50.73(a)(2)(i)(A)			<input type="checkbox"/> 50.73(a)(2)(v)(D)		<input type="checkbox"/> 73.77(a)(2)(i)	
		<input type="checkbox"/> 20.2203(a)(2)(vi)			<input type="checkbox"/> 50.73(a)(2)(i)(B)			<input type="checkbox"/> 50.73(a)(2)(vii)		<input type="checkbox"/> 73.77(a)(2)(ii)	
		<input type="checkbox"/> 50.73(a)(2)(i)(C)			<input type="checkbox"/> OTHER		Specify in Abstract below or in NRC Form 366A				
12. Licensee Contact for this LER											
Licensee Contact Amber Aboulfaida, Licensing Engineer								Telephone Number (Include Area Code) (423) 365-1818			
13. Complete One Line for each Component Failure Described in this Report											
Cause	System	Component	Manufacturer	Reportable to ICES	Cause	System	Component	Manufacturer	Reportable to ICES		
N/A	N/A	N/A	N/A	N/A							
14. Supplemental Report Expected <input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> No					15. Expected Submission Date			Month	Day	Year	
								N/A	N/A	N/A	
Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines) On June 20, 2019, at 1340 Eastern Daylight Time (EDT), a breach in excess of allowable margin was identified in the Watts Bar Nuclear Plant (WBN) Unit 2 Shield Building annulus. The breach consisted of a penetration boot seal that had pulled away from the shield building wall, creating a gap between the boot seal and the annulus wall. As a result, WBN U2 entered Technical Specification (TS) Limiting Condition for Operation (LCO) 3.6.15, Condition A, for the shield building being inoperable. On June 21, 2019, at 0036, the boot seal was repaired, and WBN U2 exited LCO 3.6.15, Condition A. There were no human performance errors identified that contributed to this event. Corrective actions included repairing the boot seal, and modifying permanent scaffolding. This event is being reported to the Nuclear Regulatory Commission (NRC) under 10 CFR 50.73(a)(2)(v)(C) as an event or condition that could have prevented fulfillment of a safety function of structures or systems that are needed to control the release of radioactive material.											

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

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.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
Watts Bar Nuclear Plant, Unit 2	05000391	YEAR	SEQUENTIAL NUMBER	REV NO.
		2019	- 002	- 00

NARRATIVE**I. Plant Operating Conditions Before the Event**

Watts Bar Nuclear Plant (WBN) Unit 2 was at 100 percent rated thermal power (RTP). Unit 1 was unaffected by this event.

II. Description of Event**A. Event Summary**

On June 20, 2019, at 1340 Eastern Daylight Time (EDT), while performing a Radiological Protection (RP) walkdown, a breach in excess of allowable margin was identified in the Watts Bar Nuclear Plant (WBN) Unit 2 Shield Building [EIS: NH] annulus. The breach consisted of a penetration boot seal [EIS: SEAL] that had pulled away from the shield building wall, creating a gap approximately 10 inches square between the boot seal and the annulus wall. As a result, WBN U2 entered Technical Specification (TS) Limiting Condition for Operation (LCO) 3.6.15, Condition A, for the shield building being inoperable. On June 21, 2019, at 0036, the boot seal was repaired, and WBN U2 exited LCO 3.6.15, Condition A.

An 8-hour non-emergency event notification (EN 54127) was made to the Nuclear Regulatory Commission (NRC) in accordance with 10 CFR 50.72(b)(3)(v) as an event or condition that could have prevented fulfillment of a safety function of structures or systems that are needed to control the release of radioactive material. This Licensee Event Report (LER) documents the reportable event under 10 CFR 50.73(a)(2)(v)(C).

B. Status of structures, components, or systems that were inoperable at the start of the event and that contributed to the event

No inoperable structures, systems, or components contributed to this condition.

C. Dates and approximate times of occurrences

<u>Date</u>	<u>Time</u> <u>(EDT)</u>	<u>Event</u>
05/02/19	---	Quality Control (QC) acceptance check on Boot Seal Installation during U2R2 (Work Order (WO) 120237990)
06/20/19	1340	Entered TS LCO 3.6.15, Condition A, Shield Building inoperable.
06/20/19	1641	Authorized performance of WO 120536836 to repair R2S065 boot seal
06/20/19	1759	8 hour report made to the NRC (EN 54127)
06/21/19	0036	Post Maintenance Test (PMT) performed satisfactorily following boot seal repair. Exited TS LCO 3.6.15, Condition A

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NARRATIVE**D. Manufacturer and model number of each component that failed during the event**

There were no components that failed during the event. The R2S065 penetration boot seal pulled away from the shield building wall.

E. Other systems or secondary functions affected

There were no other systems or secondary functions affected by this event.

F. Method of discovery of each component or system failure or procedural error

An RP technician identified the breach while performing a walkdown in the WBN Unit 2 annulus.

G. Failure mode, mechanism, and effect of each failed component

There were no components that failed during the event.

H. Operator actions

The Shield Building was declared inoperable due to the breach associated with the R2S065 penetration boot seal exceeding the allowed Unit 2 annulus breach margin. Unit 2 entered TS LCO 3.6.15, Condition A.

I. Automatically and manually initiated safety system responses

There were no automatic or manually initiated safety system responses associated with this event.

III. Cause of the Event**A. Cause of each component or system failure or personnel error**

There were no components that failed during the event. The R2S065 penetration boot seal pulled away from the shield building wall. An investigation into the event did not identify any workmanship causes. The boot seal was installed during the previous spring refueling outage (U2R2) with a Quality Control (QC) acceptance check on May 2, 2019.

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

Inadvertent contact with the boot seal is a potential cause of the annulus breach; however, no human performance causes were identified. Annulus access records were reviewed and all personnel were interviewed regarding activities conducted in the

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CONTINUATION SHEET**

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Watts Bar Nuclear Plant, Unit 2	05000391	YEAR	SEQUENTIAL NUMBER	REV NO.
		2019	- 002	- 00

NARRATIVE

annulus. No activity could be identified that would have had the potential to impact the boot seal.

IV. Analysis of the Event

The shield building is a concrete structure that surrounds the steel containment vessel. Between the containment vessel and the shield building inner wall is an annular space that collects containment leakage that may occur following a loss of coolant accident (LOCA) as well as other design basis accidents (DBAs) that release radioactive material. The shield building is required to be operable in Modes 1, 2, 3, and 4.

During normal operations when containment integrity is required, annulus vacuum is established and maintained by the annulus vacuum control subsystem. During an emergency, the Emergency Gas Treatment System (EGTS) [EIS: BH] establishes a negative pressure in the annulus between the shield building and the steel containment vessel.

The R2S065 penetration boot seal pulled away from the shield building wall, which created a 10 inch by 1 inch gap between the boot seal and the annulus wall. The 10 square inch breach exceeded the Unit 2 annulus breach margin. With this leakage the EGTS could not maintain a pressure equal to or more negative than -0.50 inches water gauge in the annulus at an elevation equivalent to the top of the Auxiliary Building, as required by Surveillance Requirement (SR) 3.6.15.4.

V. Assessment of Safety Consequences

There were no actual safety consequences as a result of this event. The WBN probabilistic risk assessment model does not specifically credit the use of EGTS when calculating the probability of core damage or large early release. Accordingly, the risk associated with this event is considered to be negligible.

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

There were no systems or components that failed during the event.

- 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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- 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

Approximately 11 hours elapsed from the time the breach was discovered until Unit 2 exited TS LCO 3.6.15.

VI. Corrective Actions

These events were entered into the Tennessee Valley Authority (TVA) Corrective Action Program and are being tracked under Condition Report (CR) 1526540.

A. Immediate Corrective Actions

The R2S065 penetration boot seal was repaired, a PMT was performed, and WBN Unit 2 exited LCO 3.6.15, Condition A.

B. Corrective Actions to Prevent Recurrence or to reduce probability of similar events occurring in the future

No workmanship or human performance errors were identified. However, learnings were shared regarding the failure, and care and attention for sensitive plant components and configuration control was emphasized. Also, permanent scaffolding was modified to preclude a similar event from occurring.

VII. Previous Similar Events at the Same Site

LER 390/2018-002-00 submitted on March 19, 2018, documents an event where the shield building was declared inoperable due to spurious equipment operation which resulted in the shield building pressure limits exceeding TS allowed values.

The cause of the previous similar event has a different direct cause than this event.

VIII. Additional Information

There is no additional information.

IX. Commitments

There are no new commitments.