



---

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

WBL-23-029

July 3, 2023

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 390/2023-001-00, Interpretation of Technical Specification (TS) Table 1.1-1 Leads to a Condition Prohibited by TS**

This submittal provides Licensee Event Report (LER) 390/2023-001-00. This LER provides details concerning a recent event where operation with Unit 1 above Mode 6 with one reactor head bolt not installed led to a condition prohibited by the Technical Specifications, which is reportable in accordance with Title 10 of the Code of Federal Regulations (10 CFR) 50.73(a)(2)(i)(B).

There are no new regulatory commitments contained in this letter. Please direct any questions concerning this matter to Jonathan Johnson, WBN Licensing Manager, at [jtjohnson0@tva.gov](mailto:jtjohnson0@tva.gov).

Respectfully,

A handwritten signature in black ink, appearing to read 'Anthony L. Williams IV', is written over a large, stylized, looping flourish.

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

U.S. Nuclear Regulatory Commission  
WBL-23-029  
Page 2  
July 3, 2023

Enclosure: LER 390/2023-001-00, "Interpretation of Technical Specification (TS) Table 1.1-1  
Leads to a Condition Prohibited by TS"

cc (w/Enclosure):

NRC Regional Administrator – Region II  
NRC Senior Resident Inspector – Watts Bar Nuclear Plant  
NRC Project Manager – Region II

**ENCLOSURE**  
**Tennessee Valley Authority**  
**Watts Bar Nuclear Plant**  
**Unit 1**

**LER 390/2023-001-00, "Interpretation of Technical Specification (TS) Table 1.1-1 Leads to a Condition Prohibited by TS"**



**LICENSEE EVENT REPORT (LER)**

(See Page 2 for required number of digits/characters for each block)  
(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 FOIA, Library, and Information Collections Branch (T-6 A10M), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by email to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; email: [oira\\_submission@omb.eop.gov](mailto:oira_submission@omb.eop.gov). The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

<b>1. Facility Name</b> Watts Bar Nuclear Plant, Unit 1	<input checked="" type="checkbox"/> <b>050</b> <input type="checkbox"/> <b>052</b>	<b>2. Docket Number</b> 00390	<b>3. Page</b> 1 OF 5
--	---	----------------------------------	--------------------------

**4. Title**  
 Interpretation of Technical Specification (TS) Table 1.1-1 Leads to a Condition Prohibited by TS

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved		
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	<input type="checkbox"/> 050	Docket Number
05	03	2023	2023	001	00	07	03	2023	N/A	<input type="checkbox"/> 050	
									N/A	<input type="checkbox"/> 052	

<b>9. Operating Mode</b> 5	<b>10. Power Level</b> 000
-------------------------------	-------------------------------

**11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)**

<input type="checkbox"/> <b>10 CFR Part 20</b>	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> <b>10 CFR Part 50</b>	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.1200(a)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 73.1200(b)
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	<input type="checkbox"/> 73.1200(c)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.1200(d)
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> <b>10 CFR Part 21</b>	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> <b>10 CFR Part 73</b>	<input type="checkbox"/> 73.1200(e)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.77(a)(1)	<input type="checkbox"/> 73.1200(f)
<input type="checkbox"/> 20.2203(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(2)(i)	<input type="checkbox"/> 73.1200(g)
<input type="checkbox"/> 20.2203(a)(2)(iv)		<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(ii)	<input type="checkbox"/> 73.1200(h)
<input type="checkbox"/> 20.2203(a)(2)(v)		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)		

**OTHER** (Specify here, in abstract, or NRC 366A).

**12. Licensee Contact for this LER**

<b>Licensee Contact</b> Dean Baker, Licensing Engineer	<b>Phone Number (Include area code)</b> 423-452-4589
---	---

**13. Complete One Line for each Component Failure Described in this Report**

Cause	System	Component	Manufacturer	Reportable to IRIS	Cause	System	Component	Manufacturer	Reportable to IRIS
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

<b>14. Supplemental Report Expected</b>				<b>15. Expected Submission Date</b>		
<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)			Month	Day	Year
				N/A	N/A	N/A

**16. Abstract** (Limit to 1326 spaces, i.e., approximately 13 single-spaced typewritten lines)

On May 3, 2023, while starting up from a refueling outage, an NRC inspector questioned compliance for Watts Bar Nuclear Plant (WBN) Unit 1 being in Mode 5 with 53 of 54 Reactor Vessel head closure bolts fully tensioned, which NRC determined was not in compliance with Technical Specification (TS) Table 1.1-1. Following review of this issue within WBN and NRC management, WBN Unit 1 was returned to Mode 6 on May 4, 2023 at 0237 Eastern Daylight Time (EDT). Investigation shows the WBN Unit 1 had operated with only 53 reactor vessel head closure bolts fully tensioned for Cycles 17 and 18 due to a damaged reactor head closure stud hole, which represents a condition prohibited by TS.

No human performance cause is attributed to this event. The 10 CFR 50.59 screening associated with this determined prior NRC approval was not required. WBN's position was supported by vendor analysis. The NRC applied a different interpretation of TS Table 1.1-1. Corrective actions included the submittal and the receipt of a TS amendment allowing operation of WBN Unit 1 with 53 reactor head closure bolts being fully tensioned. A permanent license amendment request will be submitted to allow operation with 53 reactor head closure bolts. Training will also be provided to 10 CFR 50.59 qualified individuals at WBN on this event.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 FOIA, Library, and Information Collections Branch (T-6 A10M), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: [oira\\_submission@omb.eop.gov](mailto:oira_submission@omb.eop.gov). The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. FACILITY NAME  Watts Bar Nuclear Plant, Unit 1	<input checked="" type="checkbox"/> 050	2. DOCKET NUMBER  00390	3. LER NUMBER		
	<input type="checkbox"/> 052		YEAR	SEQUENTIAL NUMBER	REV NO.
			2023	- 001	- 00

**NARRATIVE**

**I. Plant Operating Conditions before the Event**

Watts Bar Unit 1 was in Mode 5 and in process of start-up following a refueling outage.

**II. Description of Event**

**A. Event Summary**

On May 3, 2023, while starting up from a refueling outage, a Nuclear Regulatory Commission (NRC) inspector questioned compliance for Watts Bar Nuclear Plant (WBN) Unit 1 being in Mode 5 with 53 of 54 Reactor Vessel [EIS:RPV] head closure bolts fully tensioned. NRC determined this was not in compliance with Technical Specification (TS) Table 1.1-1, MODES. Following review of this issue within the Tennessee Valley Authority (TVA) and NRC management, WBN Unit 1 was returned to Mode 6 on May 4, 2023 at 0237 Eastern Daylight Time (EDT). Investigation shows that WBN Unit 1 operated with 53 reactor vessel head closure bolts fully tensioned for Cycles 17 and 18 due to a damaged reactor head closure stud hole.

This event is being reported to the NRC under 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TS.

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

None.

**C. Dates and approximate times of occurrences**

Dates and Approximate Times	Occurrence
May 13, 2020	Condition Report 1607752 documents damaged stud hole threads with reactor closure bolt location 34.
May 26, 2020 at 1132 EDT	WBN Unit 1 enters Mode 5 using Temporary Modification WBN-20-1371 to allow Unit 1 operation with one Reactor Vessel Closure bolt out of service
May 2020 through April 2023	WBN Unit 1 operates for two cycles with 53 Reactor Vessel Closure bolts in service.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 FOIA, Library, and Information Collections Branch (T-6 A10M), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: [oir\\_submission@omb.eop.gov](mailto:oir_submission@omb.eop.gov). The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. FACILITY NAME  Watts Bar Nuclear Plant, Unit 1	<input checked="" type="checkbox"/> 050	2. DOCKET NUMBER  00390	3. LER NUMBER		
	<input type="checkbox"/> 052		YEAR	SEQUENTIAL NUMBER	REV NO.
			2023	- 001	- 00

**NARRATIVE**

Dates and Approximate Times	Occurrence
May 2, 2023 at 2155 EDT	WBN Unit 1 enters Mode 5 after refueling during U1R18
May 3, 2023	NRC Resident inspector questions Operations personnel related to compliance with TS Table 1.1-1.
May 4, 2023 at 0237 EDT	WBN Unit 1 enters Mode 6
May 4, 2023	WBN submits an Emergency License Amendment Request to allow Unit 1 operation with 53 Reactor Head Closure bolts.
May 5, 2023	NRC issues Unit 1 TS Amendment 161 allowing operation with 53 Reactor Head Closure bolts for one cycle.

**D. Manufacturer and model number of each component that failed during the event**  
N/A

**E. Other systems or secondary functions affected**  
None.

**F. Method of discovery of each component or system failure or procedural error**  
On May 3, 2023, an NRC resident inspector questioned compliance with TS Table 1.1-1 for Unit 1 being in Mode 5 with 53 of 54 reactor head bolts being tensioned.

**G. The failure mode, mechanism, and effect of each failed component**  
No components failed associated with this event.

**H. Operator actions**  
Operations returned Unit 1 to Mode 6 when it was determined that TS compliance was in question.

**I. Automatically and manually initiated safety system responses**  
None.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 FOIA, Library, and Information Collections Branch (T-6 A10M), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: [oir\\_submission@omb.eop.gov](mailto:oir_submission@omb.eop.gov). The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. FACILITY NAME  Watts Bar Nuclear Plant, Unit 1	<input checked="" type="checkbox"/> 050	2. DOCKET NUMBER  00390	3. LER NUMBER		
	<input type="checkbox"/> 052		YEAR	SEQUENTIAL NUMBER	REV NO.
			2023	- 001	- 00

**NARRATIVE**

**III. Cause of the event**

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

No component or system failure or personnel error was involved.

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

No human performance cause is attributed to this event. The related 10 CFR 50.59 screening was properly developed and considered TS impacts and previous operating experience. WBN's position was supported by vendor analysis. This analysis showed that 53 tensioned bolts were required to meet ASME Code requirements.

**IV. Analysis of the event**

During the Spring 2016 refueling outage on WBN Unit 1, difficulty was encountered while attempting to remove the reactor vessel closure bolt at Location number 34. The reactor vessel is a component within the Reactor Coolant System (RCS) [EII:AB]. The bolt was eventually removed, but visual inspection of the bolt determined there was damage to the lower portion of the threads. Inspection of the bolt hole at the end of the outage determined the threads were potentially damaged and would require significant planning and equipment mobilization to repair. The site elected to perform a temporary modification to operate with one bolt removed. An Engineering evaluation and 10 CFR 50.59 screening concluded that operation with one bolt removed was acceptable. The engineering evaluation demonstrated that compliance with the American Society of Mechanical Engineers (ASME) Code, Section III would be met with 53 reactor head closure bolts installed, which is the controlling technical basis for this activity. Additional analysis was performed prior to the Spring 2023 refueling outage to support extended operation with 53 reactor head bolts tensioned. This analysis was used to support the Emergency License amendment approved by NRC for this issue.

**V. Assessment of Safety Consequences**

Operation with 53 reactor head bolts fully tensioned has been determined to be acceptable by engineering analysis.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 FOIA, Library, and Information Collections Branch (T-6 A10M), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: [oir\\_submission@omb.eop.gov](mailto:oir_submission@omb.eop.gov). The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. FACILITY NAME  Watts Bar Nuclear Plant, Unit 1	<input checked="" type="checkbox"/> 050	2. DOCKET NUMBER  00390	3. LER NUMBER		
	<input type="checkbox"/> 052		YEAR	SEQUENTIAL NUMBER	REV NO.
			2023	- 001	- 00

**NARRATIVE**

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

No components failed as a result of this issue. As shown by analysis, the reactor vessel remained in full compliance with ASME Code requirements with 53 reactor vessel closure bolts fully tensioned.

**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**

All systems required for safe shutdown remained functional.

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

Not applicable.

**VI. Corrective Actions**

This event was entered into the TVA Corrective Action Program and is being tracked under Condition Report 1854299.

**A. Immediate Corrective Actions**

Immediate corrective actions included the submittal of an emergency license amendment request and the receipt and implementation of a TS amendment allowing operation of WBN Unit 1 with 53 reactor head closure bolts being fully tensioned.

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

A license amendment will be submitted to allow permanent operation of Watts Bar Units 1 and 2 with 53 reactor head closure bolts being fully tensioned.

To reduce the potential for a similar event, training will be provided on this event to 10 CFR 50.59 qualified individuals at WBN





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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 FOIA, Library, and Information Collections Branch (T-6 A10M), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: [oir\\_submission@omb.eop.gov](mailto:oir_submission@omb.eop.gov). The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. FACILITY NAME  Watts Bar Nuclear Plant, Unit 1	<input checked="" type="checkbox"/> 050	2. DOCKET NUMBER  00390	3. LER NUMBER		
	<input type="checkbox"/> 052		YEAR	SEQUENTIAL NUMBER	REV NO.
			2023	- 001	- 00

**NARRATIVE**

**VII. Previous Similar Events at the Same Site**

None

**VIII. Additional Information**

None.

**IX. Commitments**

None.