TENNESSEE VALLEY AUTHORITY

1101 Market Street, Chattanooga, Tennessee 37402

CNL-21-041

April 29, 2021

10 CFR 50.90

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

Watts Bar Nuclear Plant, Units 1 and 2
Facility Operating Licenses Nos. NPF-90 and NPF-96
NRC Docket Nos. 50-390 and 50-391

Subject: Response to Request for Additional Information Regarding Application to Modify the Watts Bar Nuclear Plant Unit 1 and Unit 2 Technical Specifications 5.7.2.19 'Containment Leakage Rate Testing Program' (WBN-TS-19-01) (EPID L-2020-LLA-0223)

References:
1. TVA letter to NRC, CNL-20-006, "Application to Modify the Watts Bar Nuclear Plant Unit 1 and Unit 2 Technical Specifications 5.7.2.19 'Containment Leakage Rate Testing Program' (WBN-TS-19-01)," dated October 2, 2020 (ML20276A092 and ML20276A093)
2. TVA letter to NRC, CNL-20-093, "Supplement to Application to Modify the Watts Bar Nuclear Plant Unit 1 and Unit 2 Technical Specifications 5.7.2.19 'Containment Leakage Rate Testing Program' (WBN-TS-19-01) (EPID L-2020-LLA-0223)," dated December 15, 2020 (ML20350B799)
3. NRC Electronic Mail to TVA, "Request for Additional Information Regarding TVA's Request to Revise Technical Specification 5.7.2.19, 'Containment Leakage Rate Testing Program' (EPID L-2020-LLA-0223)," dated April 1, 2021 (ML21091A077)

In Reference 1, Tennessee Valley Authority (TVA) submitted a request for an amendment to Facility Operating License Nos. NPF-90 and NPF-96 for the Watts Bar Nuclear Plant (WBN), Units 1 and 2, respectively. The proposed change revises the WBN Units 1 and 2, Technical Specifications (TS) 5.7.2.19, "Containment Leakage Rate Testing Program," by adopting Nuclear Energy Institute (NEI) 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," as the implementation document for the performance-based Option B of 10 CFR Part 50, Appendix J. The proposed change also extends the Type A containment integrated leak rate testing (CILRT)

interval from 10 years to 15 years and the Type C local leakage rate testing intervals from 60 months to 75 months. In Reference 2, TVA submitted a supplement to Reference 1, which, in part, provided the Nuclear Regulatory Commission (NRC) the results of the confirmatory test as recommended in the Kalsi Engineering report that was included in Reference 1.

In Reference 3, the NRC issued a request for additional information (RAI) and requested TVA respond by April 30, 2021. The enclosure to this letter provides the TVA response to the RAI.

This letter does not change the no significant hazard considerations nor the environmental considerations contained in Reference 1. Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and the enclosure to the Tennessee Department of Environment and Conservation.

There are no new regulatory commitments associated with this submittal. Please address any questions regarding this request to Kimberly D. Hulvey at (423) 751-3275.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 29th day of April 2021.

Respectfully,

James T. Policikoski
Director, Nuclear Regulatory Affairs

Enclosure: Response to NRC Request for Additional Information

cc (Enclosure):

NRC Regional Administrator – Region II
NRC Senior Resident Inspector – Watts Bar Nuclear Plant
NRC Project Manager – Watts Bar Nuclear Plant
Director, Division of Radiological Health – Tennessee State Department of Environment and Conservation

Enclosure

Response to NRC Request for Additional Information

NRC INTRODUCTION

By letter dated October 2, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20276A092), the Tennessee Valley Authority (TVA, licensee) submitted a license amendment request (LAR) to the U.S. Nuclear Regulatory Commission (NRC) for an amendment to the operating licenses for the Watts Bar Nuclear Plant (Watts Bar), Units 1 and 2. The proposed change would revise the Watts Bar, Units 1 and 2, Technical Specifications (TS) 5.7.2.19, "Containment Leakage Rate Testing Program," by adopting Nuclear Energy Institute (NEI) 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," as the implementation document for the performance-based Option B of 10 CFR Part 50, Appendix J. The proposed change would also extend the Type A containment integrated leak rate testing (CILRT) interval from 10 years to 15 years and the Type C local leak rate testing intervals from 60 months to 75 months. Additionally, TVA requested to use a bounding value of 15.0 pounds per square inch gauge (psig) for Pa instead of the calculated Pa value as defined 10 CFR 50, Appendix J, Option B, Section II.

In a letter dated December 15, 2020 (ADAMS Accession No. ML20350B799), TVA submitted a supplement to its LAR to provide the results of confirmatory tests recommended in Kalsi Engineering Report No. 3960C (Revision 0), "Evaluation of Higher Test Pressure on Leakage for Watts Bar."

<u>REGULATORY BASIS</u>

Option B, "Performance-Based Requirements" of Appendix J, "Primary Containment Leakage Testing for Water-Cooled Power Reactors," to Part 50 of Title 10 of the Code of Federal Regulations (10 CFR), requires, in part, for Type B and C tests, that "The performance-based testing program must contain…when establishing test intervals…comparison to previous test results to examine the performance history of the overall containment system to limit leakage."

<u>INFORMATION REQUESTED</u>

The Kalsi Engineering report includes Type B and C LLRT history tables for valves in various groups at Watts Bar, Units 1 and 2. These tables are:

- *Table 1-2, "Unit 1 and 2 LLRT Leakage History," in Attachment 1, "Local Leak Rate Test Leakage Evaluation at Watts Bar for MOV Gate Valves;"*
- *Table 1-2, "Leakage History," in Attachment 2, "Local Leak Rate Test Leakage Evaluation at Watts Bar for MOV/AOV Plug Valves;"*
- *Table 1-2, "Unit 1 and Unit 2 LLRT Leakage History," in Attachment 3, "Local Leak Rate Test Leakage Evaluation at Watts Bar for Swing Check Valves;"*
- *Table 1-2, "Leakage History of Valves in Unit 1 and 2," in Attachment 4, "Local Leak Rate Test Leakage Evaluation at Watts Bar for Lift/Piston Check Valves;" and*
- *Table 1-2, "Unit 1 and Unit 2 LLRT Leakage History," in Attachment 5, "Local Leak Rate Test Leakage Evaluation at Watts Bar for AOV Globe Valves."*

In these tables, several valves were reported to have "unfavorable" leakage history. Section 4.2, "Leakage History Summary," of the main body of the Kalsi Engineering report states that "Some valves show unacceptable leakage history, but it is assumed that corrective actions are performed to restore leakage to acceptable levels (see Assumption 5.2)." Assumption 5.2 states, "For all valves it is assumed that the tested leakage at normal LLRT DP is acceptable. This assumption is reasonable since corrective actions are required if leakage exceeds acceptance criteria and does not require verification." However, there was no discussion of the evaluation or resolution of "unfavorable" or "unacceptable" leakage history in the LAR that supports the Kalsi Engineering report assumption that corrective actions were taken to address leakage history. Briefly describe the activities performed to address the "unfavorable" or "unacceptable" LLRT leakage history with respect to the tables above.

TVA Response

At the Watts Bar Nuclear Plant (WBN), each local leak rate test (LLRT) performance where the measured leakage rate exceeds the specified administrative limit is entered into the TVA corrective action program. In addition, when a measured leakage rate exceeds the administrative limit, the LLRT crew will perform basic troubleshooting to determine the source of the leakage. For example, the testers will check for external leakage of the test rig and connecting tubing/fittings, verify adequate closure of test boundary valves, and check for air flowing from the vent on the low pressure side of the containment isolation valve. This troubleshooting is important for those LLRTs where multiple valves are tested in parallel and it is necessary to determine which of those containment isolation valves needs corrective action.

In cases where an LLRT with unacceptable results involved two valves in parallel, the Kalsi Engineering report provided in the LAR identified both valves with unfavorable history. This is because TVA had provided only the raw LLRT results to Kalsi as input for their evaluation, without distinguishing which of the two valves was determined to be cause of the high leakage rate. Additional information for such situations is included in the discussion in the following tables.

When an individual component LLRT exceeds the specified administrative limit during two consecutive periodic performances, the performance criteria for unreliability of containment isolation valves (established for the 10 CFR 50.65 maintenance rule program at WBN) are exceeded. Such components are entered in the Maintenance Rule Program for Cause Determination and Evaluation (CDE). This was done for the valves identified in the Kalsi Engineering report with an unfavorable LLRT history, except for 1-CKV-67-575D. This one exception was a case where the as-found LLRT for the valve had been missed and, as a result, the as-found leakage rate had been recorded as a gross leak rate for the purposes of calculating the as-found minimum pathway leakage of the total containment leakage to comply with WBN TS 5.7.2.19. The missed as-found LLRT was entered into the WBN corrective action program.

A brief description of activities performed or planned for each valve identified in the Kalsi Engineering report with an unfavorable history is provided in the table below. The valves are listed in the order they appear in the report.

Valves identified in Attachment 1, Table 1-2, of the Kalsi Engineering report		
Valve	**Containment Penetration / Boundary**	**Description of Actions Taken / Planned**
1-FCV-62-61	X-44 / Inboard Note: This valve is leak rate tested in parallel with 1-CKV-62-639 (listed in Attachment 4, Table 1-2 of the Kalsi Engineering report)	The unfavorable leakage was attributed to valve 1-CKV-62-639. See the description of actions taken for 1-CKV-62-639 in the table of this enclosure regarding Attachment 4, Table 1-2 of the Kalsi Engineering Report.
1-FCV-70-134	X-50B / Outboard	In the WBN Unit 1 Cycle 14 refueling outage (U1R14) (spring 2017), the as-found LLRT exceeded the administrative limit. The valve disc was cut to fit the seat properly. The as-left LLRT was 0.00 standard cubic feet per hour (scfh). The as-found LLRTs in U1R15 (fall 2018) and U1R16 (spring 2020) were acceptable.

Valves identified in Attachment 2, Table 1-2, of the Kalsi Engineering report		
Valve	**Containment Penetration / Boundary**	**Description of Actions Taken / Planned**
2-FCV-31-327	X-66 / Inboard Note: This valve is leak rate tested in parallel with 2-CKV-31-3392 (listed in Attachment 4, Table 1-2 of the Kalsi Engineering report)	The unfavorable leakage was attributed to 2-CKV-31-3392. See the description of actions taken for 2-CKV-31-3392 in the table of this enclosure regarding Attachment 4, Table 1-2 of the Kalsi Engineering Report.
2-FCV-31-329	X-67 / Inboard Note: This valve is leak rate tested in parallel with 2-CKV-31-3378 (listed in Attachment 4, Table 1-2 of the Kalsi Engineering report)	The unfavorable leakage was attributed to 2-CKV-31-3378. See the description of actions taken for 2-CKV-31-3378 in the table of this enclosure regarding Attachment 4, Table 1-2 of the Kalsi Engineering Report.
2-FCV-67-130	X-69 / Outboard	In U2R2 (spring 2019), the as-found LLRT exceeded the administrative limit. Several unsuccessful attempts at making adjustments to the actuator and plug vertical position were made during U2R2 without success. The as-left LLRT also exceeded the administrative limit. An evaluation was performed to accept the leakage rate above the administrative limit based on total containment leakage rate margin in accordance with site procedures, which ensures that the overall containment acceptance criteria is not exceeded. In U2R3 (fall 2020), the as-found LLRT was less than the administrative limit and no maintenance was performed on the valve.

Valves identified in Attachment 3, Table 1-2, of the Kalsi Engineering report		
Valve	**Containment Penetration / Boundary**	**Description of Actions Taken / Planned**
1-CKV-26-1260	X-78 / Inboard	In U1R15 (fall 2018), the as-found LLRT exceeded the administrative limit. The valve was disassembled, cleaned, inspected, and reassembled. The as-left LLRT was less than the administrative limit. In U1R16 (spring 2020), the as-found LLRT was less than the administrative limit. Due to poor LLRT history, this valve has been placed in a 10 CFR 50.65 Maintenance Rule (a)(1) plan intended to drive further corrective action.
1-CKV-26-1296	X-31 / Inboard	The as-found LLRT during U1R12 (spring 2014) exceeded the administrative limit. The valve was disassembled, cleaned, inspected, and reassembled. The as-left LLRT was below the administrative limit. The as-found LLRTs during U1R13 (fall 2015), U1R14 (spring 2017), and U1R16 (spring 2020) were less than the administrative limit. The valve was not tested in U1R15. Due to poor LLRT history, this valve has been placed in a Maintenance Rule (a)(1) plan intended to drive further corrective action.
2-CKV-26-1260	X-78 / Inboard	In U2R3 (fall 2020), the as-found LLRT exceeded the administrative limit. The valve was disassembled, cleaned, inspected, and reassembled. The as-left LLRT was less than the administrative limit. Due to poor LLRT history, this valve has been placed in a Maintenance Rule (a)(1) plan intended to drive further corrective action.
1-CKV-70-679	X-50B / Inboard	In U1R12 (spring 2014), the as-found LLRT exceeded the administrative limit. The valve was disassembled, cleaned, inspected, and reassembled. During this process it was discovered that the disc was misaligned. The valve disc, hinge pin, and hinge assembly were replaced. The as-left LLRT was less than the administrative limit. The as-found LLRTs have been less than the administrative limit in subsequent periodic tests.

Valves identified in Attachment 4, Table 1-2, of the Kalsi Engineering report		
Valve	**Containment Penetration / Boundary**	**Description of Actions Taken / Planned**
2-CKV-31-3378	X-67 / Inboard Note: This valve is leak rate tested in parallel with 2-FCV-31-329 (listed in Attachment 2, Table 1-2 of the Kalsi Engineering report)	The as-found LLRTs during U2R1 (fall 2017), U2R2 (spring 2019), and U2R3 (fall 2020) exceeded the administrative limit. After corrective maintenance, the as-left LLRTs for each outage were below administrative limits. Due to poor LLRT history, this valve has been placed in a Maintenance Rule (a)(1) plan intended to drive further corrective action.
2-CKV-31-3392	X-66 / Inboard Note: This valve is leak rate tested in parallel with 2-FCV-31-327 (listed in Attachment 2, Table 1-2 of the Kalsi Engineering report)	The as-found LLRTs during U2R1 (fall 2017), U2R2 (spring 2019), and U2R3 (fall 2020) exceeded the administrative limit. Each time the valve was disassembled, cleaned, inspected, and reassembled. As-left LLRTs for each outage were below administrative limits. Due to poor LLRT history, this valve has been placed in a Maintenance Rule (a)(1) plan intended to drive further corrective action.
1-CKV-62-639	X-44 / Inboard Note: This valve is leak rate tested in parallel with 1-FCV-62-61 (listed in Attachment 1, Table 1-2 of the Kalsi Engineering report)	In U1R15 (fall 2018), the as-found LLRT exceeded the administrative limit. A disc to seat contact check (“blue check”) of the seating surfaces of 1-CKV-62-639 was performed and found to be inadequate. The valve was lapped until the blue check was satisfactory. The as-left leak rate was 0.00 scfh. In U1R16 (spring 2020), the as-found LLRT was 0.00 scfh.
1-CKV-67-575D	X-57A / Inboard	In U1R15 (fall 2018), the as-found LLRT was missed as noted in the RAI response. The missed test was entered into the corrective action program and a gross leak rate was assigned for the as-found test for calculation of the minimum pathway total containment leakage rate. The as-found LLRTs for all other periodic tests (before and after the missed test) have been less than the administrative limit.

Valves identified in Attachment 5, Table 1-2, of the Kalsi Engineering report		
Valve	**Containment Penetration / Boundary**	**Description of Actions Taken / Planned**
2-FCV-32-111	X-34 / Outboard	The as-found LLRTs during U2R1 (fall 2017), U2R2 (spring 2019), and U2R3 (fall 2020) exceeded the administrative limit. An evaluation was performed to accept the U2R3 leakage rate above the administrative limit based on valve service conditions, total containment leakage rate margin, and relatively consistent leakage rates measured in each outage. Due to poor LLRT history, this valve has been placed in a Maintenance Rule (a)(1) plan intended to drive further corrective action.
1-FCV-63-23 / 1-FCV-63-84	X-30 / Outboard Note: These valves are leak rate tested in parallel	The as-found LLRTs during U1R15 (fall 2018) and U1R16 (spring 2020) exceeded the administrative limit. An evaluation was performed to accept the leakage rate above the administrative limit based on the relatively low leakage rate, total containment leakage rate margin, and consistent leakage rates in each outage. Troubleshooting determined that 1-FCV-63-23 is the valve that is leaking and not 1-FCV-63-84. Due to poor LLRT history, this valve has been placed in a Maintenance Rule (a)(1) plan intended to drive further corrective action.