



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-17-087

July 7, 2017

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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: **Justification for Performing Extended Watts Bar Nuclear Plant (WBN) Unit 2 Technical Specification (TS) Surveillances during the First WBN Unit 2 Refueling Outage (U2R1)**

- Reference:
1. TVA Letter to NRC, CNL-16-159, "Application to Modify Watts Bar Nuclear Plant Unit 2 Technical Specifications to Extend Surveillance Requirement (SR) Intervals for SRs 3.6.11.2 and 3.6.11.3 (WBN-TS-16-022)," dated September 30, 2016 (ML16277A477)
 2. TVA Letter to NRC, CNL-16-164, "Application to Modify Watts Bar Nuclear Plant Unit 2 Technical Specifications to Extend Surveillance Requirement Intervals for AC Sources (WBN-TS-16-024)," dated October 17, 2016 (ML16291A543)
 3. TVA Letter to NRC, CNL-16-110, "Application to Modify Watts Bar Nuclear Plant Unit 2 Technical Specifications to Extend Surveillance Requirement Specified Intervals (WBN-TS-16-020)," dated November 23, 2016 (ML16333A250)
 4. TVA letter to NRC, CNL-17-022, "Application to Modify the Watts Bar Nuclear Plant Unit 2 Technical Specification 5.7.2.19 Regarding One-Time Extension of 10 CFR 50, Appendix J Type C Local Leakage Rate Tests (391-WBN-TS-17-05)," dated February 16, 2017 (ML17048A515)
 5. NRC letter to TVA, "Watts Bar Nuclear Plant, Unit 2 - Issuance of Amendment Regarding One-Time Extension of Intervals for Surveillance Requirements 3.6.11.2 and 3.6.11.3 (CAC No. MF8441)," dated January 5, 2017 (ML16343A814)

6. NRC letter to TVA, "Watts Bar Nuclear Plant, Units 1 and 2 - Issuance of Amendments Regarding One-Time Extension of Technical Specification Surveillance Requirements for Alternating Current Sources (CAC Nos. MF8481 AND MF8482)," dated June 28, 2017 (ML17138A100)
7. NRC letter to TVA, "Watts Bar Nuclear Plant, Unit 2 - Issuance of Amendment Regarding One-Time Extension of Intervals for Specified Surveillance Requirements (CAC No. MF8869)," dated April 7, 2017 (ML17074A501)
8. NRC letter to TVA, "Watts Bar Nuclear Plant, Unit 2 - Issuance of Amendment Regarding One-Time Extension of 10 CFR 50, Appendix J Type C Local Leakage Rate Tests (CAC No. MF9297)," dated May 18, 2017 (ML17123A228)

In References 1, 2, and 3, the Tennessee Valley Authority (TVA) submitted requests for amendments to the Watts Bar Nuclear Plant (WBN) Unit 2 Technical Specifications (TS) to extend, on a one-time basis, certain Surveillance Requirements (SRs) that are performed on an 18-month frequency in conjunction with a refueling outage. In Reference 4, TVA submitted an amendment request to revise Technical Specification (TS) 5.7.2.19 to extend, on a one-time basis, the Type C local leak rate tests (LLRTs) for certain containment isolation valves. The purpose of these requests was to prevent a cold shutdown of WBN Unit 2 (i.e., Mode 5) solely to perform these SRs (henceforth the term "SRs" also includes the LLRTs in TS 5.7.2.19). Reference 1 was approved by the Nuclear Regulatory Commission (NRC) in Reference 5. Reference 2 was approved by the NRC in Reference 6. Reference 3 was partially approved by the NRC in Reference 7. Reference 4 was approved by the NRC in Reference 8. The remaining portion of Reference 3 is also currently under NRC review with a need date of July 24, 2017. Each of the SRs that were evaluated in References 1, 2, 3, and 4 included a technical justification as to why the SRs could not be performed when the unit is operating (i.e., Modes 1 through 4). Accordingly, TVA planned to perform the extended SRs during the first WBN Unit 2 refueling outage (U2R1) scheduled for October 2017.

In References 1, 2, 3, and 4, TVA included a commitment to perform the SRs listed in the proposed amendments prior to their extended due date, "if WBN Unit 2 entered Mode 5 of sufficient duration such that the SRs can be performed." WBN Unit 2 entered Mode 5 on April 26, 2017, as part of a forced outage to perform a condenser vacuum repair. WBN Unit 2 is scheduled to remain in Mode 5 until approximately July 9, 2017.

There are 64 SRs in References 1, 2, 3, and 4 that encompass the performance of 28 surveillance instructions (SIs). In most cases, full completion of an SR requires the performance of multiple SIs that can involve various plant conditions. During the current WBN Unit 2 forced outage, TVA performed eight SIs related to the extended SRs, which resulted in the full or partial completion of 12 of the extended SRs.

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The purpose of this letter is to provide the NRC with the justification for those specific SRs that are not scheduled to be completely performed during the current extended outage. TVA takes our commitment in the referenced licensed amendments seriously. Each of the SRs that are not scheduled to be performed was evaluated by a team including Operations, Work Management, and Licensing. This review included a risk evaluation for conducting each SI that considered the effect on nuclear safety and the effect on plant personnel from a safety and radiological aspect. The enclosure to this letter provides the justification for not performing each of the extended SRs during the current WBN Unit 2 forced outage. Overall, TVA determined that performing the extended SRs during the current forced outage does not provide a corresponding safety benefit. Furthermore, performing these extended SRs during the WBN U2R1 outage will not affect the safe operation and accident mitigation ability of WBN Unit 2.

Therefore, TVA has determined that it is more prudent from a plant and personnel safety aspect and reduced risk to the plant to perform the SRs, listed in the enclosure to this letter, during the WBN U2R1 outage rather than during the current WBN Unit 2 forced outage.

There are no new regulatory commitments contained in this submittal. Please address any questions regarding this submittal to Mr. Edward D. Schrull at (423) 751-3850.

Respectfully,

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Enclosure: Justification for not Performing Extended Surveillance Requirements during the Watts Bar Nuclear Plant Unit 2 Extended Forced Outage

cc (Enclosures):

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

Enclosure

Justification for not Performing Extended Surveillance Requirements during the Watts Bar Nuclear Plant Unit 2 Extended Forced Outage

Evaluation

Table 1 to this enclosure provides the justification for not performing certain extended surveillance requirements (SRs), listed in References 1 through 4, during the current Watts Bar Nuclear Plant (WBN) Unit 2 forced outage. Specifically, Table 1 lists the surveillances Instructions (SIs) associated with the extended SRs, the affected SRs, the status of the NRC review of the extended SRs, and the justification for not performing the SRs during the current WBN Unit 2 forced outage. The extended SRs will be performed during the WBN Unit 2 refueling outage (U2R1) outage scheduled for October 2017 and prior to their required completion dates in accordance with References 1 through 4.

TVA decided to maintain WBN Unit 2 in Mode 5 during the forced outage with the RCS pressurized to support reactor coolant pump (RCP) operation. This configuration minimized the impact on nuclear safety by ensuring diverse means of decay heat removal. By maintaining the reactor coolant system (RCS) pressurized and loops filled (as defined in Technical Specification (TS) 3.4.7), the RCPs could be utilized for decay heat removal in addition to two trains of residual heat removal (RHR). Additionally, in the event of a loss of all forced circulation (i.e., the RCPs and RHR), natural circulation could be readily established with plant procedures for decay heat removal.

References

1. TVA Letter to NRC, CNL-16-159, "Application to Modify Watts Bar Nuclear Plant Unit 2 Technical Specifications to Extend Surveillance Requirement(SR) Intervals for SRs 3.6.11.2 and 3.6.11.3 (WBN-TS-16-022)," dated September 30, 2016 (ML16277A477)
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Enclosure

Table 1
Justification for not Performing the Extended SRs During the WBN Unit 2 Forced Outage

Item Number	SI	Description	SR	Status of NRC Review	Justification
1	2-SI-61-2	18 Month Ice Weighing	3.6.11.2 and 3.6.11.3	Note 1	Performance of this SI requires extensive equipment staging, readiness, and pre-outage work. This SI typically takes 45 to 50 days for preparation and implementation. Specialized resources needed to perform this SI were involved with the recent Sequoyah Nuclear Plant outage that ended on June 2, 2017. Therefore, performing this SI would have extended the current forced outage for Unit 2 without a commensurate benefit to plant and personnel safety.

Enclosure

Table 1
Justification for not Performing the Extended SRs During the WBN Unit 2 Forced Outage

Item Number	SI	Description	SR	Status of NRC Review	Justification
2	2-TRI-63-903	System Leakage Test - Safety Injection System [centrifugal charging pump (CCP) Injection]	5.7.2.4b,	CNL-16-110 Attachment 17 Group 2, currently under NRC review	As discussed in Technical Requirements Instruction (TRI) 2-TRI-63-903, Section 1.3A., this TRI should be performed during Mode 6 (or Core Empty), but it could be performed in Mode 5. The rationale for performing this SI in Mode 6 (or Core Empty) in conjunction with 2-SI-63-905, "Boron Injection Check Valve Flow Test During Refueling Outages," is that it requires plant conditions to be established to allow diverting CCP flow from the normal (or alternate) charging flow path to the high-head safety injection flow path. Performance of this SI during Mode 5 requires careful coordination of injection flow, charging flow, letdown flow, and reactor coolant pump seal flows to satisfy RCS pressure and temperature limits (TS 3.4.3), and to maintain approximately constant levels in the pressurizer and volume control tank (VCT). Further, if this SI were performed in Mode 5, injection of cold water from the refueling water storage tank (RWST) could challenge allowable RCS and pressurizer cooldown rates.

Enclosure

Table 1
Justification for not Performing the Extended SRs During the WBN Unit 2 Forced Outage

Item Number	SI	Description	SR	Status of NRC Review	Justification
3	2-SI-63-915-A 2-SI-63-915-B	Safety Injection System - Valve PIV and Full-Stroke Exercising (Train A and B)	3.3.2.10-1.c 3.3.2.10-1.d 3.3.2.10-1.e 3.3.2.10-7.b 3.3.3.3-11	Note 2	Performance of these SIs requires draining portions of the RHR and containment spray headers (Train A for 2-SI-63-915-A and Train B for 2-SI-63-915-B). With one train of RHR inoperable or unavailable, shutdown risk would increase due to less than the full complement of equipment to satisfy decay heat removal. Portions of the SIs also require the unit to be in Mode 6 (or core empty) with the reactor pressure vessel (RPV) head removed. Mode 6 is not planned until U2R1.
4	2-SI-99-648-A 2-SI-99-648-B	Response Time Test - Containment Sump To RHR Pump 2A-A Slave Relay K648 Train A and B	3.3.2.10-7.b	Note 2	Performance of these SIs requires removing the respective train of RHR from service. With one train of RHR inoperable or unavailable, shutdown risk would increase due to less than the full complement of equipment to satisfy decay heat removal. Therefore, as noted in the Evaluation section of this Enclosure, TVA decided to maintain WBN Unit 2 in Mode 5 during the forced outage with the RCS pressurized to support RCP operation. This configuration minimized the impact on nuclear safety by ensuring diverse means of decay heat removal. By maintaining the reactor coolant system (RCS) pressurized and loops filled (as defined in Technical Specification (TS) 3.4.7), the RCPs could be utilized for decay heat removal in addition to two trains of residual heat removal (RHR).

Enclosure

Table 1
Justification for not Performing the Extended SRs During the WBN Unit 2 Forced Outage

Item Number	SI	Description	SR	Status of NRC Review	Justification
5	0-SI-82-5 0-SI-82-6	18 Month Loss of Offsite Power With Safety Injection DG 2A-A and DG 2B-B	3.8.1.9 3.8.1.10 3.8.1.11 3.8.1.12 3.8.1.13 3.8.1.16 3.8.1.17 3.8.1.19	Note 3	Performance of these SIs requires RCS temperature < 140°F and isolation of cooling water to the RCP motor coolers, oil coolers and thermal barrier cooler flow. This requires all four RCPs to be removed from service. As noted in the Evaluation section of this Enclosure, TVA decided to maintain WBN Unit 2 in Mode 5 during the forced outage with the RCS pressurized to support RCP operation. Thus, in the event of a loss of all forced circulation (i.e., the RCPs and RHR), natural circulation could be readily established with plant procedures for decay heat removal. Performance of these SIs also requires actuation of relays resulting in isolation of the containment glycol system. Not having the glycol system in service to support the ice bed could lead to higher rates of ice melt and sublimation. Removing the glycol system from service is of higher concern during the summer. Ice condenser air handling units are limited in their ability to remove humidity from containment atmosphere. Atmospheric humidity conditions are of concern during the summer months in maintaining the glycol system in service to sustain adequate containment ice bed temperatures. Removing the glycol system from service could also result in having to reweigh and / or refill ice baskets. Refer to Item 1.
			3.3.2.10-1.c 3.3.2.10-1.d 3.3.2.10-1.e 3.3.2.10-2.c 3.3.2.10-6.b 3.3.2.10-6.e 3.3.3.3-11	Note 2	

Enclosure

Table 1
Justification for not Performing the Extended SRs During the WBN Unit 2 Forced Outage

Item Number	SI	Description	SR	Status of NRC Review	Justification
6	2-SI-99-300-A 2-SI-99-300-B	Engineered Safety Features Actuation System Slave Relay Go Test Train A and B	3.3.3.3-11	Note 2	These SIs are scheduled to be performed in conjunction with 0-SI-82-5 and 0-SI-82-6 because these SIs also test some of the same components tested by 2-SI-99-300-A and B. See Item 5 for further justification.
			3.3.2.5-1.b 3.3.2.5-2.b 3.3.2.5-3.a(2) 3.3.2.5-3.b(2) 3.3.2.5-4.b 3.3.2.5-5.a 3.3.2.5-6.a 3.3.2.5-7.a 3.3.2.7-3.b(2) 3.3.2.8-2.a 3.3.2.8-3.a(1) 3.3.2.8-3.b(1) 3.3.6.5-2 3.5.2.5 3.6.3.6 3.6.6.3 3.6.6.4 3.6.9.3 3.7.7.3 3.7.7.4 3.7.8.2 3.7.8.3	CNL-16-110 Attachments 6, 7, 12, and 15 Group 2, currently under NRC review	

Enclosure

Table 1
Justification for not Performing the Extended SRs During the WBN Unit 2 Forced Outage

Item Number	SI	Description	SR	Status of NRC Review	Justification
7	2-SI-62-701	Containment Isolation Valve LLRT Chemical and Volume Control System (CVCS)	5.7.2.19	Note 4	Performance of this SI would secure RCP seal return. In accordance with TVA procedure 2-GO-10, "Reactor Coolant System Drain and Fill Operations," RCP seal injection should be in service when RCS level is above the RCP seals or the RCS pressure is above atmospheric, unless impellers are back seated. There are no plans to lower the RCS level below RCP seals or back seat the RCPs during this forced outage. Also, the RCS remained pressurized and the RCPs remained in operation for the duration of the forced outage.
8	2-SI-0-53.2-A 2-SI-0-53.2-B	18 Month Remote Shutdown Transfer Switch Verification Outage Train A and B	3.3.4.2-4.b 3.3.4.2-4.c 3.3.4.2-5.a	Note 2	In order to perform these SIs, the RCPs must be secured for portions of this test (see Item 5 for further discussion of the RCPs). Performance of these SIs also requires removal of the glycol system from service, which would adversely affect containment ice bed temperatures (see Item 5 for related justification).
9	2-SI-62-907	CVCS Valve Position Indication Verification and Full Stroke Exercising	3.3.2.10-1.c 3.3.2.10-1.d 3.3.3.3-11 3.3.4.2-3.b	Note 2	In order to perform this SI, the RCPs must be secured for portions of this test (see Item 7 for further discussion of the RCPs).
10	2-SI-67-701-C	Containment Isolation Valve LLRT Lower Compartment Essential Raw Cooling Water (ERCW)	5.7.2.19	Note 4	Performance of this SI requires lower compartment cooling to be removed from service. This challenges the cooling to the in-service RCP motor cooler that could result in shutdown of all RCPs. Stopping of the RCPs would result in a loss of one method of decay heat removal and RCS pressure control.

Enclosure

Table 1
Justification for not Performing the Extended SRs During the WBN Unit 2 Forced Outage

Item Number	SI	Description	SR	Status of NRC Review	Justification
11	2-SI-68-81	Offline Channel Calibration Reactor Vessel Level Instrumentation (RV LIS) and RCS Wide Range Pressure Transmitters Train A and B	3.3.3.2-5 3.3.3.2-6	CNL-16-110 Attachment 9 Group 2, currently under NRC review	This SI requires actions and manipulations to be performed on top of the RPV head, which is completed when the missile shields are removed in order to allow access to the head area. There are no plans to remove the missile shields during the forced outage due to the increased dose to personnel.
12	2-SI-70-908-A 2-SI-70-908-B	Component Cooling System Valve Position Indication Verification Train A and B	3.3.2.10-1.c 3.3.2.10-1.d 3.3.2.10-3.b.(3) 3.3.3.3-11	Note 2	Cycling the valves required by these SIs would momentarily interrupt cooling water flow to either the RCP oil coolers or the thermal barrier coolers. Therefore, the RCPs would have to be secured to perform this test, which is not planned for this forced outage (see Item 5 for related justification).
13	2-SI-304-3	Divider Barrier Seal Inspection	3.6.13.5	CNL-16-110 Attachment 16 Group 2, currently under NRC review	Without the equipment hatch being opened, the only way to get the required amount of scaffolding into containment for this SI would be through the airlock. Large racks and loads of scaffolding are brought in through the equipment hatch (upper containment) and then through hatches down to lower containment during a refueling outage. Opening the equipment hatch requires pulling the shield wall plugs, opening the equipment access doors, and installing the equipment hatch bridge. This operation was not performed during this forced outage.

Enclosure

Table 1
Justification for not Performing the Extended SRs During the WBN Unit 2 Forced Outage

Item Number	SI	Description	SR	Status of NRC Review	Justification
14	2-SI-57-1-B	18 Month Unit 2 B Train ESF Load Sequence and Reset Timer Test	3.8.1.18	Note 3	Performance of this SI requires removing the respective train of RHR from service. With one train of RHR inoperable or unavailable, shutdown risk would increase due to less than the full complement of equipment to satisfy decay heat removal. Therefore, as noted in the Evaluation section of this Enclosure, TVA decided to maintain WBN Unit 2 in Mode 5 during the forced outage with the RCS pressurized to support RCP operation.

Notes

1. Approved by NRC on January 5, 2017 (ML16343A814)
2. Approved by NRC on April 7, 2017 (ML17074A501)
3. Approved by NRC on June 28, 2017 (ML17138A100)
4. Approved by NRC on May 18, 2017 (ML17123A228)