



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

CNL-19-050

May 13, 2019

10 CFR 50.90

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

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

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

Subject: **Response to NRC Request for Additional Information Regarding Application to Revise Watts Bar Nuclear Plant, Units 1 and 2, Technical Specifications 3.8.1, 3.8.7, 3.8.8, and 3.8.9, Regarding Electrical Power Systems (WBN-TS-18-08) (EPID L-2018-LLA-0492)**

- References:
1. TVA letter to NRC, CNL-18-119, "Application to Revise Watts Bar Nuclear Plant, Units 1 and 2, Technical Specifications 3.8.1, 3.8.7, 3.8.8, and 3.8.9, Regarding Electrical Power Systems (WBN-TS-18-08)," dated November 26, 2018 (ML18331A134)
 2. NRC Electronic Mail to TVA, "Watts Bar TS 3.8.1 3.8.7 3.8.8 and 3.8.9 RAIs" dated April 15, 2019

In Reference 1, TVA submitted a request for an amendment to the technical specifications (TS) for Watts Bar Nuclear Plant (WBN), Units 1 and 2.

The proposed amendment revises the WBN Unit 1 and Unit 2 TS 3.8.1, "AC Sources - Operating," TS 3.8.7, "Inverters - Operating," TS 3.8.8, "Inverters - Shutdown," and TS 3.8.9, "Distribution Systems - Operating," to support performance of the 6.9 kiloVolt (kV) and 480 Volt (V) shutdown board (SDBD) maintenance. In Reference 2, NRC issued a Request for Additional Information (RAI) and requested TVA respond by May 15, 2019. The enclosure to this letter provides the response to the RAI.

The enclosure to this letter does not change the no significant hazard considerations or 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.

U.S. Nuclear Regulatory Commission
CNL-19-050
Page 2
May 13, 2019

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

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 13th day of May 2019.

Respectfully,



Erin K. Henderson
Director, Nuclear Regulatory Affairs

Enclosure: Response to NRC Request for Additional Information

cc (Enclosure):

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

Enclosure

WATTS BAR, UNITS 1 AND 2
REQUEST FOR ADDITIONAL INFORMATION (RAI) REGARDING
CHANGES TO TECHNICAL SPECIFICATIONS SECTIONS 3.8.1, 3.8.7, 3.8.8, AND 3.8.9
(EPID NO. L-2018-LLA-0492)

By letter dated November 26, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession number ML18331A134), Tennessee Valley Authority (the licensee) requested an amendment to the Technical Specifications (TSs) for Watts Bar Nuclear Plant (WBN) Units 1 and 2. The proposed license amendment request (LAR) would revise the WBN Unit 1 and Unit 2 TS 3.8.1, "AC Sources - Operating," TS 3.8.7, "Inverters - Operating," TS 3.8.8, "Inverters - Shutdown," and TS 3.8.9, "Distribution Systems - Operating," to support performance of the 6.9 kiloVolt (kV) and 480 Volt (V) shutdown board (SDBD) maintenance.

The U.S. Nuclear Regulatory Commission (NRC) staff from Electrical Engineering Operating Branch (EEOB) has determined that additional information is needed to complete the review of the WBN license amendment. The staff requests the licensee to provide additional information as stated below:

Regulatory Requirement

The regulations at 10 CFR 50.36, "Technical specifications," establish the requirements related to the content of the TS. Pursuant to 10 CFR 50.36(c) TS are required to include items in five specific categories related to station operation: (1) Safety limits, limiting safety system settings, and limiting control settings, (2) Limited conditions of operation (LCOs), (3) Surveillance requirements (SR), (4) Design features; and (5) Administrative controls. The proposed changes in this LAR relate to the LCO and SR categories.

EEOB-RAI-1

In TS 3.8.1, Condition D, Completion Time D.3 is being proposed as 7 days. To keep the risk low while performing preventive maintenance (PM) on any 6.9 kV shutdown board and its related downstream equipment, please provide following additional information:

- a. Describe how the remaining 6.9 kV shutdown boards and related downstream equipment will be protected. Also confirm that that no discretionary maintenance will be performed on this equipment during the Completion Time.*
- b. List any other compensatory measures.*

TVA Response to EEOB-RAI-1

- a. With equipment or components out of service, TVA employs a graded approach to defense-in-depth (DID) and protected equipment strategies based on the operating status of the affected unit and a unit in an outage. Because the alternating current (AC) electrical distribution system is a system shared between WBN Units 1 and 2, the DID strategies address both the outage unit and the operating unit.*

Enclosure

TVA procedure NPG-SPP-07.3.4, "Protected Equipment," provides guidance for protecting plant equipment in order to minimize the potential for adverse operational events. The guidance in this procedure applies during normal and degraded plant conditions, including during maintenance activities affecting the operability of plant structures, systems, and components (SSCs). Protecting important equipment is an essential element in managing risk, during both plant operation and shutdown conditions. NPG-SPP-07.3.4 states that risk evaluations are performed in accordance with NPG-SPP-09.11.1, "Equipment Out Of Service Management," for Modes 1 and 2, and NPG-SPP-07.2.11, "Shutdown Risk Management," for all other Modes.

TVA procedure NPG-SPP-07.2.11 provides guidance for implementation of the Shutdown Risk Management Program. For the outage unit, at least once every 24 hours, control room operators complete a DID assessment. The DID assessment provides instructions for verifying the status and availability of components required to maintain key safety functions (reactivity control, decay heat removal, containment, reactor coolant system inventory, power availability, and spent fuel cooling/inventory). The assessment includes guidance to ensure protected equipment/systems are identified and protected. Work is screened to ensure that protected components or systems are not jeopardized. Protected components or systems are identified on a shift turnover checklist and reviewed during shift turnover meetings and pre-job briefings, as well as through the use of physical or administrative barriers to prevent entry into a given area.

For the outage unit, TVA procedure NPG-SPP-09.11.3, "Shutdown Equipment Out of Service Management," provides guidance for using the Shutdown Equipment Out of Service (EOOS) software and site-specific EOOS models to assess risk of maintenance activities, as defined by 10 CFR 50.65 (a)(4), "Requirements for monitoring the effectiveness of maintenance at nuclear power plants." The Shutdown EOOS computer program takes the status (i.e., available, unavailable, protected) of key plant equipment and produces an output of the relative level of safety/defense in depth of key shutdown areas (i.e., reactivity control, shutdown cooling, AC power (onsite, offsite), fuel pool cooling, inventory control, support equipment).

For the operating unit, TVA procedure NPG-SPP-09.11.1 is used to assess risk of maintenance activities, as defined by 10 CFR 50.65 (a)(4). Quantitative risk information provided by the at-power EOOS model is considered as one input to a blended approach to risk management that includes deterministic information, operating experience, engineering judgment, and management standards. For those activities requiring risk management due to elevated risk levels, the following actions are considered to provide additional risk awareness and control, reduce activity duration, and reduce magnitude of risk increase.

- Discussion of the activity with the operating shift and operator approval in advance of the planned evolution.
- Pre-job briefing of maintenance personnel in advance of the evolution emphasizing the risk aspects of the evolution.
- Presence of appropriate engineering or technical personnel for appropriate portions of the activity.

Enclosure

- Pre-staging of parts and materials.
- Crew walk down of the tag out boundary and activity prior to conducting maintenance.
- Consider the use of appropriate HU (Human Performance) tools to reduce the potential for human performance problems.
- Operations personnel walk down redundant and opposite trained/division designated equipment to ensure availability to mitigate challenges.
- Conduct of training and mock ups to familiarize personnel with the activity.
- Consider activity performance around the clock, or on back shifts.
- Establish contingency plans to specifically restore from the out of service condition rapidly, if needed, to make equipment available.
- Minimize other work in areas that could affect event initiators (for example reactor protection system areas, switchyard, diesel generator rooms, switchgear rooms) to decrease the frequency of initiating events that are mitigated by the safety function served by the out of service SSC.
- Minimize work in areas that could affect other redundant systems such that there is enhanced likelihood of the availability of the safety functions at issue served by the SSCs in those areas.
- Establishment of alternate success paths for performance of the safety functions of the out of service SSC.

For both the outage unit and the operating unit, TVA procedures 1/2- PI-OPS-1-PE, "Protected Equipment," define the requirements for physical barriers, which may consist of roping off areas, posting signs, and/or placing cover devices with a Protected Equipment tag attached to a door or breaker compartment handle. When Operations determines that additional barriers are needed, placement of Protected Equipment tags is documented and maintained.

In addition, TVA procedures 1/2- PI-OPS-1-PE preclude work on or near protected equipment and limit access to the area to emergency situations and non-intrusive monitoring of running equipment per operator rounds. The procedures provide for exceptions on a case-by-case basis to maintain operability, as approved by the Shift Manager (SM) or designee. In these cases, the SM/designee ensures the appropriate precautions are taken and necessary oversight is provided, based on the risk of the activity. Prior to entering the protected equipment area, personnel are briefed as to the potential consequences of an error while in the area and that time in the area shall be minimized. Once the evolution has been approved, the personnel conducting the work in the protected equipment area will notify the Control Room prior to entry and immediately upon exit from the area.

- b. The compensatory measures taken for planned maintenance on a 6.9 kV shutdown board are dictated by the TS 3.8.1 requirements for extending the Completion Time for an inoperable diesel generator (DG) beyond 72 hours.

Enclosure

When a 6.9 kV shutdown board is being de-energized for planned maintenance and the notes associated with TS 3.8.1, Condition D, are met, the breakers from the normal and alternate offsite circuits, as well as from the maintenance feeder are opened. Additionally, the emergency DG output breaker to the 6.9 kV shutdown board is opened to preclude the DG from loading onto the de-energized 6.9 kV shutdown board. Upon opening these breakers, the offsite circuit and DG are declared inoperable and TS 3.8.1, Conditions B and D are entered. It is important to note that the planned maintenance on the 6.9 kV and 480 V shutdown boards cannot be performed unless the boards are de-energized. Therefore, any time that Condition D is entered, Condition B will also be entered.

Per TS 3.8.1, Condition B, the Completion Time for the inoperable DG is limited to 72 hours unless a 6.9 kV FLEX DG is available as an alternate power source. Because the shutdown board maintenance is anticipated to require more than 72 hours to complete, a 6.9 kV FLEX DG will be required to be available as an alternate power source prior to performing the planned maintenance on the shutdown boards. In addition, per TS 3.8.1, Condition B, Bases, compliance with the contingency actions listed in Bases Table 3.8.1-2 is required whenever Condition B is entered for a planned or unplanned outage that will extend beyond 72 hours.

The contingencies listed in TS Bases Table 3.8.1-2 and TVA procedure 0-TI-12.16, "Diesel Generator Outage T/S or SR Contingency Actions," include:

- verifying that the offsite power system is stable
- verifying that no adverse weather conditions are expected during the outage period
- ensuring adequate ventilation for the 6.9 kV shutdown board rooms, elevation 772 transformer rooms, and 480 V shutdown board rooms
- precluding the removal from service of the reactor trip breakers
- precluding the removal from service of the turbine-driven auxiliary feedwater (AFW) pump
- precluding the removal from service of the AFW level control valves
- precluding the removal from service of the opposite train residual heat removal pump

EEOB-RAI-2

In TS 3.8.9, Condition G, Completion Time G.1 is being proposed as 24 hours. Please provide following additional information:

- a. *Describe how the remaining AC shutdown boards and related downstream equipment will be protected and confirm that no discretionary maintenance will be performed on this equipment during the Completion Time.*
- b. *List any other compensatory measures.*

Enclosure

TVA Response to EEOB-RAI-2

- a. For planned maintenance on an opposite unit AC electrical power distribution subsystem, the requirements for protected equipment described in the response to EEOB RAI-1 are applied, including the restrictions on working on or near protected equipment. Accordingly, planned entry into TS 3.8.9, Condition G, is precluded, if any redundant equipment is inoperable.

If unplanned entry into TS 3.8.9, Condition G, results in a loss of a safety-function, LCO 3.0.6 requires entry into the associated TS for the affected shared systems. A loss of safety function for one or more shared systems requires entry into LCO 3.0.3, thereby requiring initiation of a shutdown of each operating unit.

- b. There are no compensatory measures necessary for one or more inoperable AC electrical distribution subsystems on the opposite unit. The protected redundant equipment is capable of mitigating design basis events during the 24 hours that the opposite unit AC electrical distribution subsystems are inoperable. If the redundant equipment is inoperable, planned entry into TS 3.8.9, Condition G, is precluded. If a loss of safety function occurs for unplanned entry into TS 3.8.9, Condition G, LCO 3.0.6 requires entry into the associated TS for the affected shared systems. A loss of safety function for one or more shared systems requires entry into LCO 3.0.3, thereby requiring initiation of a shutdown of each operating unit.