From:	Kimberly Green
Sent:	Friday, November 22, 2024 7:14 AM
To:	Hughes, Shawna Marie
Cc:	Wells, Russell Douglas
Subject:	Request for Additional Information -TVA LAR to Revise Watts Bar TS 3.7.11 for Main Control Room Chiller Extension of Completion Time (EPID L-2024-LLA-0041)
Attachments:	MCR Chiller LAR Final RAI - November 20 2024.docx

Dear Shawna Hughes:

By letter dated April 4, 2024 (Agencywide Documents Access and Management System Accession No. ML24059A159), Tennessee Valley Authority (TVA) submitted a license amendment request to the U.S. Nuclear Regulatory Commission (NRC) that requested changes to Watts Bar Nuclear Plant (Watts Bar), Units 1 and 2, Technical Specification (TS) 3.7.11, "Control Room Emergency Air Temperature Control System (CREATCS)." Specifically, the proposed changes would modify the TS Required Actions for two inoperable CREATCS trains; add a new Condition that is applicable in Modes 5 and 6, or during movement of irradiated fuel assemblies; and delete the temporary footnote associated with Condition E.

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing your submittal and has identified areas where additional information is needed to complete its review. A draft request for additional information (RAI) was previously sent to you via email on October 29, 2024. At your request, a clarification call was held on November 6, to clarify the NRC staff's request (ML24318A860). As a result of the November 6, clarification call, the NRC revised all draft RAIs except RAI IOLB-1, added additional information to the regulatory basis section to support the revisions, and added draft RAIs SCPB-2 and SCPB-3 to request information regarding the non-safety related chiller. The revised draft RAI was transmitted to you by email dated November 13, 2024 (ML24325A471). TVA requested a call to obtain clarification on draft RAI STSB-2 and draft RAI SCPB-3 (new). A clarification call was held on November 19, 2024. As a result of the clarification call, the NRC eliminated RAI SCPB-3 and added a reworded version as part b to RAI SCPB-2.

After the November 19, 2024, call, the NRC staff added part c to RAI SCPB-2. A draft of this new part was transmitted to you by email dated November 21, 2024. TVA did not request clarification regarding the new request.

A response to the attached RAI is due by January 10, 2025, the date requested by TVA. The NRC staff considers that timely responses to RAIs help ensure sufficient time is available for staff review and contribute toward the NRC's goal of efficient and effective use of staff resources. If circumstances result in the need to revise the requested response date, please me at (301) 415-1627 or via email at Kimberly.Green@nrc.gov.

Sincerely,
Kimberly J. Green, Senior Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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Created By: Kimberly.Green@nrc.gov

Recipients:
"Wells, Russell Douglas" <rdwells0@tva.gov>
Tracking Status: None
"Hughes, Shawna Marie" <smhughes@tva.gov>
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REQUEST FOR ADDITIONAL INFORMATION

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

MAIN CONTROL ROOM CHILLER COMPLETION TIME EXTENSION

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-390 AND 50-391

Introduction

By letter dated April 4, 2024, (Agencywide Documents Access Management System (ADAMS) Accession No. ML24095A159), Tennessee Valley Authority (TVA, the licensee) submitted a license amendment request (LAR) for Watts Bar Nuclear Plant (WBN), Units 1 and 2, to revise Technical Specification (TS) 3.7.11, "Control Room Emergency Air Temperature Control System (CREATCS)," to: modify the TS Required Actions for two inoperable CREATCS trains; add a new Condition that is applicable in Modes 5 and 6, or during movement of irradiated fuel assemblies; and delete the temporary footnote associated with Condition E.

The purpose of the CREATCS is to provide air temperature control for the main control room (MCR) during normal operation, anticipated transients, and design basis accidents to support operator habitability and operability of the MCR equipment. The CREATCS is not explicitly credited in the accident analysis, but the analyses assume that the MCR temperature supports its purpose. The system has two independent and redundant trains that provide cooling of recirculated air inside the MCR; a single train can provide the required temperature control. WBN, Units 1 and 2, share an MCR.

In the event two CREATCS trains are inoperable, TS 3.7.11, proposed Condition D would be entered, which has a completion time of 96 hours to restore one CREATCS train to operable status, provided mitigating actions ensure the MCR temperature is controlled. The mitigating actions employ, in part, operator actions. The mitigating actions also include the use of a temporary non-safety related chiller with a dedicated diesel generator to provide power to the non-safety related chiller.

The U.S. Nuclear Regulatory Commission (NRC) staff is currently reviewing the LAR and has identified areas where additional information is needed to complete its review. The requests for additional information (RAIs) are identified below.

Regulatory Basis

Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, "Domestic Licensing of Production and Utilization Facilities," establishes the minimum requirements for the principal design criteria for water-cooled nuclear power plants.

WBN, Units 1 and 2, were designed to meet the intent of the "Proposed General Design Criteria for Nuclear Power Plant Construction Permits" published in July 1967, with the WBN

construction permits issued in January 1973. The WBN Dual-Unit Updated Final Safety Analysis Report (UFSAR) (ML23346A225) addresses the General Design Criteria (GDC) specified in Appendix A to 10 CFR Part 50. The specific GDC applicable to this LAR are:

General Design Criterion 4, "Environmental and dynamic effects design bases," states that "[s]tructures, systems, and components important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents."

General Design Criterion 5, "Sharing of structures, systems, and components," states that "[s]tructures, systems, and components important to safety shall not be shared among nuclear power units unless it can be shown that such sharing will not significantly impair their ability to perform their safety functions, including, in the event of an accident in one unit, an orderly shutdown and cooldown of the remaining units."

General Design Criterion 19, "Control room," states, that "[a] control room shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents. Equipment at appropriate locations outside the control room shall be provided: (1) with a design capability for prompt hot shutdown of the reactor, including necessary instrumentation and controls to maintain the unit in a safe condition during hot shutdown, and (2) with a potential capability for subsequent cold shutdown of the reactor through the use of suitable procedures."

General Design Criterion 22, "Protection system independence," states, that "[t]he protection system shall be designed to assure that the effects of natural phenomena, and of normal operating, maintenance, testing, and postulated accident conditions on redundant channels do not result in loss of the protection function, or shall be demonstrated to be acceptable on some other defined basis."

In 10 CFR 50.36, "Technical specifications," the NRC established its regulatory requirements related to the content of TSs. Pursuant to 10 CFR 50.36, TSs are required to include items in the following categories: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation (LCOs); (3) surveillance requirements; (4) design features; and (5) administrative controls. The regulation does not specify the requirements to be included in a plant's TSs.

The regulation at 10 CFR 50.36(a)(1) states, in part, "[a] summary statement of the bases or reasons for such specifications … shall also be included in the application, but shall not become part of the technical specifications."

As required in 10 CFR 50.36(c)(2), LCOs are the lowest functional capability or performance level of equipment required for safe operation of the facility. When LCOs are not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the LCOs can be met.

NUREG-1764, "Guidance for the Review of Changes to Human Actions," Revision 1 (ML072640413), provides the NRC staff guidance about the level of review for the human actions (HAs) described in the proposed amendment using a risk-informed approach. Appendix A to NUREG-1764 contains two tables of generic HAs for boiling-water reactors and

pressurized-water reactors (PWRs) that are risk-important. The NRC staff reviewed Table A.2, "Generic PWR Human Actions That Are Risk Important," for WBN, Units 1 and 2. Based on the review of Table A.2, the staff conducted a Level III review, the least stringent, because the operator actions related to the modification of the MCR CREATCS chillers are not considered risk important. For a Level III review, "The licensee should provide adequate assurance that the proposed change meets current regulations, except where specific exemptions are requested under 10 CFR 50.12 or 10 CFR 2.802."

Requests

RAI IOLB-1

TVA previously stated that a qualified person would be in charge and trained on the operation of the temporary chiller (refer to section 3.2.5, "Testing and Training," of the LAR dated May 19, 2020 (ML20140A342)). In Section 3.2, "MCR Non-Safety Related Chiller Water Equipment Description," of the current LAR, TVA stated, in part, that "…TVA has decided to retain the non-safety related chiller." However, the LAR does not include information about the qualified individual who will operate the temporary chiller.

a. Describe any changes to this qualified individual's role and its acceptability now that the temporary non-safety related chiller has been proposed to be retained.

b. Describe any changes the continued use of the non-safety related chiller may have on the operator's workload and how any additional workload will be determined to be acceptable.

RAI STSB-1

The current TS 3.7.11, condition D states "Two CREATCS trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies," with Required Action to suspend movement of irradiated fuel assemblies immediately. Based on LCO 3.7.11 modes of applicability (MODES 1, 2, 3, 4, 5, and 6; during movement of irradiated fuel assemblies), proposed TS 3.7.11 Condition D allows fuel movement in the modes of applicability for up to 96 hours before entering Condition F, which requires immediate suspension of movement of irradiated fuel assemblies. Condition F of the proposed change requires entry when Required Action and associated Completion Time of Condition D not met, or during movement of irradiated fuel assemblies.

The proposed bases statement for F.1 conflicts with the proposed TS requirements, as it states:

> F.1
>
> In MODE 5 or 6, or during movement of irradiated fuel assemblies, with two CREATCS trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

Explain these conflicting statements in the Bases for F.1 allowing fuel moves while in proposed condition D for up to 96 hours with two CREATCS trains inoperable.

RAI STSB-2

WBN TS section 5.6, “Technical Specifications (TS) Bases Control Program,” states in part:

> 5.6.2 Licensees may make changes to Bases without prior NRC approval provided the changes do not require either of the following:
>
> a. A change in the TS incorporated in the license; or
> b. A change to the updated FSAR or Bases that requires NRC approval pursuant to 10 CFR 50.59.

The LAR states “[c]hanges to the existing TS Bases are provided for information only and will be implemented under the TS Bases Control Program.” The Bases markup included in the LAR for Condition A.1 includes the following added text, “including the option to provide normal cooling with a non-safety related chiller and the remaining train in standby.” However, there is no corresponding proposed change for TS 3.7.11, Condition A.

a. Confirm that this proposed Bases change has been evaluated under the TS Bases Control Program. If so, provide responses to requests b and c below.

b. For the configuration described in the Bases for Condition A.1, state whether the remaining operable train in standby requires any manual action to perform its specified safety function.

c. As indicated in UFSAR Table 9.4-7 (Sheet 14 of 50), “Either Temp. Switch 0-TS-31-88B or Flow Switch 0-FS-31-84 starts redundant Air Handling Unit B-B.” If the system is unable to perform automatic initiation of the “operable” train in standby to meet its specified safety function, provide the basis for the conclusion that the standby train is operable.

RAI DORL-1

WBN UFSAR section 9.4.1.3 states, in part, that:

> All MCR equipment operates normally at an ambient temperature of 75 °F. Abnormal excursions of short duration (12 hours or less) to 104 °F maximum and 60 °F minimum may occur without adverse effects on the equipment.

These sorts of temperature limits (on equipment or the location where the equipment is located) are typically established based on equipment design specifications and equipment environmental qualification reports.

The current LAR states, “As noted in References 1 and 3, the 90 °F temperature limit provides adequate margin between the normal MCR operating temperature of 75 °F and a limit that ensures that the equipment operability limit of 104 °F is not exceeded.” The May 19, 2020, LAR (i.e., Reference 1), stated that the provision (i.e., the MCR temperature exceeds 90 °F or the duration without a train of CREATCS being operable exceeds four days) is only applicable during pre-planned modification and testing activities for the upgrade of the MCR chillers.

In TS 3.7.11, Condition D, TVA proposes to allow the temperature in the MCR to go up to 90 °F for up to 96 hours to allow the restoration of one train of CREATCS to operable on a permanent basis. However, TVA has not provided any information regarding why or how the 90 °F temperature limit ensures equipment operability.

Justify the proposed 90 °F temperature limit (for up to 96 hours) in the proposed Action D.2 and explain how this limit ensures equipment operability in the event of the loss of cooling function.

RAI SCPB-1

In the LAR, TVA provides operating experience to justify the proposed 96-hour completion time for restoring one train of CREATCS when two trains are inoperable (i.e., proposed Condition D). The NRC staff notes that the times for restoring one train of CREATCS to operable status cited in the LAR were for entry into Condition A, which allows a flexible restoration period to restore one train of CREATCS to operable within the 30-day Completion Time. The NRC staff also notes that the times given in the LAR for the recent MCR chiller outages are for the total outage time, not necessarily the time to restore the train to operable. The times cited in Table 3 of Reference 1 (ML20140A342) in the LAR are also the amount of time the chiller was unavailable, not the amount of time to restore the train to operable.

TVA cites the Braidwood amendments issued in 2018, and the Catawba amendments issued in 2024 as precedence. In those LARs, the licensees cite operating experience related to two trains inoperable, which requires a more expedited restoration and is more appropriate for TVA's proposed Condition D. In those instances, one train of CREATCS was restored to operable within 23 hours or less. In the NRC staff's safety evaluations, the staff found that the proposed 24-hour Completion Time was consistent with precedent and industry experience that has shown a 24-hour Completion Time provides a reasonable time to restore operability to at least one train of CREATCS. Therefore, the staff does not see any relevance of the referenced precedence regarding industry experience to justify the extended 96-hour completion time.

TVA provided list of events in the LAR resulting in both WBN CREATCS trains inoperable and, based on the licensee event reports, were resolved well under the 24-hour duration.

- May 9, 1997, TVA reported an event for WBN, Unit 1 (ML073250262). – Condition was resolved in 3 minutes
- September 24, 1998, TVA reported an event for WBN, Unit 1 (ML073250317) – Condition was resolved in 6 minutes
- August 7, 2019, TVA reported an event for WBN, Unit 1 (ML19219A219) – Event was not directly related to CREATCS failure and condition was resolved in 6 hours

As indicated in LAR:

> There are TS in the Westinghouse improved STS (NUREG-1431, Revision 5) which provide a Completion Time for two inoperable filtration systems due to an inoperable building boundary. These include TS 3.7.10, "Control Room Emergency Filtration System," TS 3.7.12, "Emergency Core Cooling System Pump Room Exhaust Air Cleanup System," and TS 3.7.13, "Fuel Building Air Cleanup System." The Completion Time was found to be acceptable for these TS based on the low probability of an event and the use of compensatory measures.

These are based on a 24-hour Completion Time which was found to be acceptable based on the low probability of an event and the use of compensatory measures.

The NRC staff notes that the initial basis for the 96-hour delayed entry into LCO 3.0.3 cited in the LAR, dated May 19, 2020, was approved on a one-time basis to allow post-maintenance testing (PMT) following the replacement of the MCR chiller(s). TVA noted that during testing of the modified train, there may be cooling water flow and/or air flow anomalies, therefore, a delayed entry into LCO 3.0.3 was needed to allow stabilization of the water and air flow from the modified CREATCS train during PMT. The NRC staff cited this basis in its safety evaluation dated May 5, 2021 (ML21078A484). In the current LAR, TVA is requesting a delayed entry into proposed Condition E no matter the cause of the two trains being inoperable.

Provide a justification and basis for the proposed 96-hour Completion Time to restore one train of CREATCS to operable in proposed Condition D.

RAI SCPB-2

The May 19, 2020, LAR indicated that the non-safety related chiller in conjunction with the existing CREATCS air handling units would be capable of providing adequate cooling to maintain the MCR conservatively below 80 °F. In its letter, dated May 5, 2021, the NRC approved this LAR as a one-time amendment that allowed the use of a temporary, non-safety related chiller to support MCR cooling during the replacement of the CREATCS chillers.

The current LAR describes plans to use a non-safety related chiller to provide backup cooling in the event both CREATCS trains become inoperable. Section 3.2 of the current LAR provides a description of the non-safety related chiller and refers to the May 19, 2020, LAR, the December 16, 2020, RAI response (ML20351A424), the May 5, 2021, safety evaluation, and the NRC regulatory audit summary (ML21012A084).

a. Describe any differences between the “temporary non-safety related chiller system” from the previously reviewed configuration, and the proposed non-safety related chiller equipment and configuration to support the mitigating measures proposed in the current LAR.

b. Confirm that the sizing of the non-safety related chiller and related heatup calculation referenced in the May 19, 2020, LAR are bounding for the proposed non-safety related chiller configuration referred to in the current LAR.

c. The NRC staff notes that in TVA letter CNL-23-015, dated February 27, 2023 (ML23058A447), TVA identified several changes from the May 19, 2020, LAR (Table 2) and the NRC regulatory audit summary (Table 3), and what TVA has currently planned (as of February 27, 2023). One such change is going from a 2.5-inch diameter supply and return hose to 3-, 4-, and 6-inch hoses. However, TVA did not include any information on potential flooding impacts and line breaks due to the larger size hoses. Describe any potential impacts due to the change in hose sizes. Additionally, describe any changes to the control room envelope penetrations, piping connections, and locations due to the larger hose sizes or other reasons that differ from what have been previously described and included on the docket.

RAI EMIB-1

Section 9.4.1.3, “Safety Evaluation,” of the WBN UFSAR states that the control building air-conditioning systems are engineered safety feature (ESF) equipment. Section 3.2, “MCR Non-Safety Related Chilled Water Equipment Description,” of the LAR states that the non-safety related chiller was initially planned to be a temporary system during the MCR CREATCS chiller project, but that TVA has decided to retain the non-safety related chiller. Therefore, TVA proposes to have the chiller and supporting equipment available to be attached to the existing air handling units through permanent connections in the CREATCS chilled water loop. Further, the proposed change to the TS Bases on page B 3.7-60 indicates that the proposed chiller modification includes the option to provide normal cooling with a non-safety related chiller and the remaining train in standby. Additionally, the proposed Bases for Conditions D.1, D.2, and D.3 state that a non-safety related chiller system with a diesel generator to provide power to the non-safety related system will be operated.

a. With the assumed use of the proposed non-safety related chiller system to perform an ESF function, discuss the applicability of the chiller system, including its pumps, valves, and dynamic restraints, to the requirements in paragraph ISTA-1100, “Scope,” of Subsection ISTA, “General Requirements,” in the American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code), 2004 Edition through the 2006 Addenda (current OM Code of Record for WBN, Units 1 and 2) as incorporated by reference in 10 CFR 50.55a, “Codes and standards.”

b. If the non-safety related chiller system is justified to be outside the scope of ISTA-1100, describe the periodic testing and maintenance activities that will demonstrate the operational readiness of the non-safety related components within the chiller system to perform the ESF functions of the CREATCS.

c. In 10 CFR 50.65(b), the NRC states that the scope of the monitoring program specified in 10 CFR 50.65(a)(1) is to include non-safety related structures, systems, and components whose failure could cause a reactor scram or actuation of a safety-related system. Based on the proposed TS Bases statement for Conditions D.1, D,2, and D.3 regarding use of the non-safety chiller and standby safety-related chiller configuration, confirm that the non-safety related chiller system will be incorporated into the Maintenance Rule program.