



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

July 9, 2015

Mr. Joseph W. Shea  
Corporate Vice President, Nuclear Licensing  
Tennessee Valley Authority  
1101 Market Street, LP 3R-C  
Chattanooga TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 1 – SUPPLEMENTAL INFORMATION  
NEEDED FOR ACCEPTANCE OF REQUESTED LICENSING ACTION  
REGARDING APPLICATION TO ADD TECHNICAL SPECIFICATIONS TO  
SUPPORT DUAL-UNIT OPERATIONS (TAC NO. MF6376)

Dear Mr. Shea:

By letter dated June 17, 2015, Tennessee Valley Authority (TVA) submitted a license amendment request for Watts Bar Nuclear Plant (WBN), Unit 1 (Agencywide Documents Access and Management System Accession No. ML15170A474). The proposed amendment request would modify the Technical Specifications (TSs) to define support systems needed in the first 48 hours after a unit shutdown when steam generators are not available for heat removal. The proposed change is required to support dual-unit operation of WBN, if Unit 2 receives an operating license. The purpose of this letter is to provide the results of the U.S. Nuclear Regulatory Commission (NRC) staff's acceptance review of this amendment request. The acceptance review was performed to determine if there is sufficient technical information in scope and depth to allow the NRC staff to complete its detailed technical review. The acceptance review is also intended to identify whether the application has any readily apparent information insufficiencies in its characterization of the regulatory requirements or the licensing basis of the plant.

Consistent with Section 50.90 of Title 10 of the *Code of Federal Regulations* (10 CFR), an amendment to the license (including the TSs) must fully describe the changes requested, and following, as far as applicable, the form prescribed for original applications. Section 50.34 of 10 CFR addresses the content of technical information required. This section stipulates that the submittal address the design and operating characteristics, unusual or novel design features, and principal safety considerations.

The NRC staff has reviewed your application and concluded that the information delineated in Enclosures 1, 2, 3, and 4 to this letter is necessary to enable the staff to make an independent assessment regarding the acceptability of the proposed amendment in terms of regulatory requirements and the protection of public health and safety and the environment.

In order to make the application complete, the NRC staff requests that TVA supplement the application to address the information described in the enclosures. This will enable the NRC staff to complete its detailed technical review. If information responsive to the NRC staff's request is not received in a timely manner, the application will not be accepted for review pursuant to 10 CFR 2.101, and the NRC staff will cease its review activities associated with the application. If the application is subsequently accepted for review, you will be advised of any

J. Shea

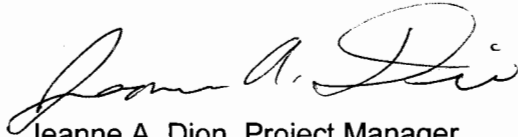
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further information needed to support the NRC staff's detailed technical review by separate correspondence.

The information requested and associated timeframes in the Enclosures were discussed with Gordon Arent and other members of your staff on July 1, 2015.

If you have any questions, please contact me at (301) 415-1349 or [jeanne.dion@nrc.gov](mailto:jeanne.dion@nrc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Jeanne A. Dion". The signature is fluid and cursive, with the first name "Jeanne" being the most prominent.

Jeanne A. Dion, Project Manager  
Watts Bar Special Projects Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-390

Enclosures:

1. Supplemental Information Related to Balance of Plant
2. Supplemental Information Related to Containment
3. Supplemental Information Related to Human Factors
4. Supplemental Information Related to Radiological Protection

cc w/enclosures: Distribution via Listserv

SUPPLEMENTAL INFORMATION NEEDED FOR BALANCE OF PLANT

LICENSE AMENDMENT REQUEST TO ADD TECHNICAL

SPECIFICATIONS TO SUPPORT DUAL UNIT OPERATIONS

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-390

Information needed by the U.S. Nuclear Regulatory Commission staff to begin its review of the Tennessee Valley Authority's (TVA) request to add technical specifications to support dual-unit operations related to balance of plant considerations is described below.

1. Proposed Component Cooling System (CCS) TS 3.7.16 and Essential Raw Cooling Water (ERCW) system TS 3.7.17 include APPLICABILITY NOTE b, which states that the limiting conditions for operation (LCOs) are not applicable "When complying with Required Actions to be in MODE 5." The only justification provided in the submittal for this MODE APPLICABILITY exclusion is stated in the proposed Bases for these Technical Specifications (TSs), which refer to proposed additions to LCO 3.0.6 Bases consistent with Technical Specifications Task Force (TSTF) Traveler TSTF-273-A. TSTF-273-A clarifies the Safety Function Determination Program (SFDP) process by specifying that assuming a single failure or loss of electrical power when performing an analysis is not required. To adopt a TSTF change the licensee must state that the reasoning for the change applies for its facility and specifically how it applies to the plant-specific licensing basis.

The submittal did not provide justification for the inclusion of APPLICABILITY NOTE b. Also, the relationship of the proposed TSTF-273-A changes to the proposed CCS and ERCW TSs was not articulated.

The staff needs this information to understand the application of the proposed exception and SFDP clarification to the interpretation of the proposed CCS and ERCW TSs. For example, the staff postulated a scenario in which the MODE APPLICABILITY NOTE b exception may result in the inability to complete required actions of other TSs. Specifically, TS 3.8.1 (AC [Alternating Current] Sources – Operating), ACTION G, requires in the event of a loss of offsite power with loss of an onsite emergency power train that Unit 1 be in Mode 5 in 37 hours. The licensee has acknowledged that in the event that this postulated scenario occurs shortly following a unit shutdown it may be incapable of completing this required action in the specified time period without ensuring the availability of the additional CCS and ERCW pumps that the proposed TSs would make available; however, the MODE APPLICABILITY NOTE b exception appears to exclude requiring the availability of these pumps in the event of a TS-required shutdown.

Provide information to justify and explain the inclusion of APPLICABILITY NOTE b in the proposed TSs 3.7.16 and 3.7.17. Also, clearly articulate the relationship of the proposed adoption of TSTF-273-A changes to the proposed CCS and ERCW TSs. All known scenarios similar to that of TS 3.8.1 discussed above should be identified and discussed.

2. The licensee's letter dated January 22, 2015 (ADAMS Accession Number ML15187A403), stated that there are two events where a unit may need to be returned to Mode 3 from Mode 4 or Mode 5, without all the conditions for a mode change required by the TS being satisfied. The descriptions of the proposed CCS and ERCW TSs in TVA's letter dated June 17, 2015, address one of the events, but do not address the other event, described in TVA's January 22 letter as:

"A simultaneous or near simultaneous shutdown of both units occurs. The units are being cooled down. The units may be in Mode 4 or Mode 5, a loss of offsite power occurs, and simultaneously there is the loss of an emergency power train."

Provide discussion of this second event in the proposed change.

3. The licensee stated that Unit 1 could be maintained in Mode 3 or Mode 4 with decay heat being removed through the steam generators for at least 48 hours as one of the options for managing a unit shutdown. Using the steam generators in some scenarios, including a loss of offsite power, would require operation of Auxiliary Feed Water (AFW) for up to 48 hours; however, the Condensate Storage Tank (CST) lacks sufficient inventory to support operation of AFW for 48 hours. Final Safety Analysis Report (FSAR) Section 9.2.6.1 states, "The ERCW system pool quality feedwater will be used during an extreme emergency when safety is the prime consideration and steam generator cleanliness is of secondary importance."

Address the use of available and approved clean water sources, ERCW, and the CST in accordance with the approved licensing basis. The submittal should address whether ERCW would be added to the non-accident unit's steam generators for events other than those described in FSAR 9.2.6.3. Also address a dual-unit shutdown and cooldown to Mode 5, for instance as required by LCO 3.0.3, and the available water sources that are credited for use, including reference to approved procedures that implement these water sources for steam generator cooldown methods.

The information listed in this enclosure was discussed with Gordon Arent and other members of your staff on July 1, 2015. A supplement addressing this information is expected by July 14, 2015.

SUPPLEMENTAL INFORMATION NEEDED FOR CONTAINMENT

LICENSE AMENDMENT REQUEST TO ADD TECHNICAL

SPECIFICATIONS TO SUPPORT DUAL UNIT OPERATIONS

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-390

Information needed by the U.S. Nuclear Regulatory Commission staff to begin its review of the Tennessee Valley Authority's (the licensee) request to add technical specifications to support dual-unit operations related to containment considerations is described below.

In the June 17, 2015, submittal, the licensee committed to provide a revised containment pressure analysis by separate correspondence to reflect the dual-unit Essential Raw Cooling Water (ERCW) system flowrate to the Component Cooling System (CCS) heat exchangers. Please provide quantitative information regarding the impact of changes resulting from dual-unit operation of the ERCW and CCS systems, including the changes proposed to ensure compliance with General Design Criterion 5, on containment performance for both Unit 1 and Unit 2.

The information provided for both units should include the results of containment pressure, temperature, and sump temperature responses, and net positive suction head analysis. These analyses should include corrections for errors in the WCAP-10325-P-A loss of coolant accident (LOCA) mass and energy (M&E) release methodology reported in Nuclear Safety Advisory Letters (NSALs)-06-6, -11-5, and -14-2.

Additionally, the NRC staff is aware of Westinghouse's InfoGram IG-14-1, dated November 5, 2014, which states that the LOCA containment M&E release analysis methodology was found to use a reactor coolant system (RCS) stainless steel volumetric heat capacity value lower than the American Society of Mechanical Engineers (ASME) values. The staff has received information which indicates that the impact on the LOCA peak containment pressure in the current licensing basis would be significant if the analysis included the ASME values for the RCS metal volumetric heat capacity. Therefore, the information provided in response to this request should include use of the ASME values for the RCS metal volumetric heat capacity.

The analysis for Unit 1 should also provide information consistent with the licensee's December 17, 2014, response to Request for Additional Information (RAI) regarding Watts Bar Unit 2 Final Safety Analysis Report (FSAR), Amendment 112, Chapter 6, RAI Number SCVB-RAI-3 (ADAMS Accession Number ML14352A248). In addition, consistent with Watts Bar Unit 2, please revisit the initial containment temperatures stated in assumption number (10) in Section 6.2.1.3.3 of the Watts Bar Unit 1 FSAR, and revise the containment analysis for conservatism based on the maximum containment air temperatures specified in TS 3.6.5.

The information listed in this enclosure was discussed with Gordon Arent and other members of your staff on July 1, and with Bob Bryan of your staff on July 9, 2015. A supplement addressing this information for Unit 2 is expected by August 19, 2015, and for Unit 1 is expected by September 11, 2015.

SUPPLEMENTAL INFORMATION NEEDED FOR HUMAN FACTORS

LICENSE AMENDMENT REQUEST TO ADD TECHNICAL  
SPECIFICATIONS TO SUPPORT DUAL UNIT OPERATIONS

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-390

Information needed by the U.S. Nuclear Regulatory Commission staff to begin its review of the Tennessee Valley Authority's (TVA) request to add technical specifications to support dual-unit operations related to human factors considerations is described below.

TVA's June 17, 2015, submittal, identified several manual operator actions associated with the proposed change.

1. Provide a description of the operator actions being added, changed, or deleted.
2. Provide a description of changes, additions or deletions to procedures in addition to those listed on page E1-12, if any (e.g., LOCA, fire).
3. Provide a description of changes, additions, or deletions to training or to the plant-specific simulator.
4. Identify any changes, additions or deletions to instrumentation, controls, alarms, annunciators, and Safety Parameter Display System.
5. Provide a description of the validation of the feasibility and reliability of added or changed operator actions, including time required vs. time available.
6. Identify any applicable precedents or other operating experience.

The information listed in this enclosure was discussed with Gordon Arent and other members of your staff on July 1, 2015. A supplement addressing this information is expected by July 14, 2015.

SUPPLEMENTAL INFORMATION NEEDED FOR RADIATION PROTECTION

LICENSE AMENDMENT REQUEST TO ADD TECHNICAL  
SPECIFICATIONS TO SUPPORT DUAL UNIT OPERATIONS

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-390

Information needed by the U.S. Nuclear Regulatory Commission staff to begin its review of the Tennessee Valley Authority's request to add technical specifications to support dual-unit operations related to radiation protection considerations is described below.

Provide information regarding the basis for the statement on page E1-11 that the mission dose is within the General Design Criterion 19 criteria, including:

- Plant layout drawings depicting access and egress routes.
- Maximum anticipated accident dose rates.
- Maximum mission dose for the operator performing this manual action.

The level of detail should be consistent with the response provided to Final Safety Analysis Report Chapter 12 Request for Additional Information Number 6 in support of the Unit 2 operating license review.

The information listed in this enclosure was discussed with Gordon Arent and other members of your staff on July 1, 2015. A supplement addressing this information is expected by July 14, 2015.



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application. If the application is subsequently accepted for review, you will be advised of any further information needed to support the NRC staff's detailed technical review by separate correspondence.

The information requested and associated timeframes in the Enclosures were discussed with Gordon Arent and other members of your staff on July 1, 2015.

If you have any questions, please contact me at (301) 415-1349 or [jeanne.dion@nrc.gov](mailto:jeanne.dion@nrc.gov).

Sincerely,

*/RA/*

Jeanne A. Dion, Project Manager  
Watts Bar Special Projects Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-390

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1. Supplemental Information Related to Balance of Plant
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**ADAMS Accession No. ML15187A403**

\* by e-mail

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