



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

February 6, 2018

Mr. Joseph W. Shea  
Vice President, Nuclear Regulatory  
Affairs and Support Services  
Tennessee Valley Authority  
1101 Market Street, LP 4A  
Chattanooga, TN 37402-2801

**SUBJECT: WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2 – SUPPLEMENTAL  
INFORMATION NEEDED FOR ACCEPTANCE OF REQUESTED LICENSING  
ACTION RE: AMENDMENT TO REVISE TECHNICAL SPECIFICATION 4.2.1  
AND TECHNICAL SPECIFICATIONS RELATED TO FUEL STORAGE  
(EPID L-2017-LLA-0427)**

Dear Mr. Shea:

By letter dated December 20, 2017 (Agencywide Documents Access and Management System Accession No. ML17354B282), Tennessee Valley Authority submitted a license amendment request for the Watts Bar Nuclear Plant, Units 1 and 2. The proposed amendments would revise Watts Bar, Unit 2, Technical Specification 4.2.1, "Fuel Assemblies," to add a limit on the number of tritium producing burnable absorber rods that can be placed in the Unit 2 reactor. The amendments also proposed technical specification changes related to new criticality analyses performed for the spent fuel storage racks.

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 technical specifications) 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 the enclosure to this letter is necessary to enable the staff to make an independent assessment regarding the acceptability of the proposed amendments in terms of regulatory requirements and the protection of public health and safety and the environment.

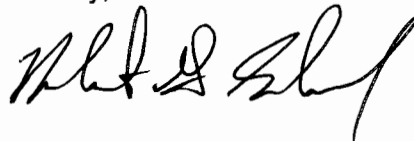
In order to make the application complete, the NRC staff requests that Tennessee Valley Authority supplement the application to address the information requested in the enclosure by February 16, 2017. This will enable the NRC staff to begin its detailed technical review. If the

information responsive to the NRC staff's request is not received by the above date, the application will not be accepted for review pursuant to 10 CFR 2.101, and the NRC will cease its review activities associated with the application. If the application is subsequently accepted for review, you will be advised of any further information needed to support the staff's detailed technical review by separate correspondence.

The information requested and associated time frame in this letter were discussed with Mr. Russell Wells and other members of your staff on January 30, 2017.

If you have any questions, please contact me at 301-415-6020 or [Robert.Schaaf@nrc.gov](mailto:Robert.Schaaf@nrc.gov).

Sincerely,

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

Robert G. Schaaf, Senior Project Manager  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-390 and 50-391

Enclosure:  
Supplemental Information Needed

cc: Listserv

SUPPLEMENTAL INFORMATION NEEDED  
AMENDMENT REQUEST TO REVISE TECHNICAL SPECIFICATION 4.2.1 AND  
TECHNICAL SPECIFICATIONS RELATED TO FUEL STORAGE  
TENNESSEE VALLEY AUTHORITY  
WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2  
DOCKET NOS. 50-390 AND 50-391

1. Technical Specification Changes

Enclosure 1 of the application does not contain a sufficient description or justification for the proposed changes to the Technical Specifications (TSs). The application should be supplemented to provide a concise description of the changes to Watts Bar Nuclear Plant (Watts Bar), Unit 1, TSs 3.7.15, 3.7.18, 3.9.9, 4.3, and 5.7.2.21, and Watts Bar, Unit 2, TSs 3.7.15, 3.7.18, 3.9.9, 4.2.1, 4.3, and 5.7.2.21, and sufficient information regarding the rationale for the changes.

2. Application Enclosure 1, Section 4.1.4, Reactor Vessel Integrity Analysis

The U.S. Nuclear Regulatory Commission (NRC) staff performed a preliminary review of WCAP-18191-NP, Revision 0, "Watts Bar Unit 2 Heatup and Cooldown Limit Curves for Normal Operation and Supplemental Reactor Vessel Integrity Evaluations" (May 2017), provided as Enclosure 2 to the application. Table E-1 of WCAP-18191-NP reports a limiting inside surface neutron fluence for the reactor pressure vessel (RPV) at 32 effective full-power years (EFPY) of  $1.861\text{E}+19$  n/cm<sup>2</sup> for neutron energy (E) greater than 1 MeV. The NRC staff also reviewed report WCAP-17305-NP, Revision 2, "Watts Bar Unit 2 Heatup and Cooldown Limit Curves for Normal Operation and PTLR Support Documentation" (December 2009), referenced in Enclosure 2 of the application. In Table C-1 of WCAP-17035-NP, Tennessee Valley Authority reported that the limiting inside surface neutron fluence for the RPV at 32 EFPY was  $3.17\text{E}+19$  n/cm<sup>2</sup> for neutron energy greater than 1 MeV. The WCAP-18191-NP value for neutron fluence (with tritium producing burnable absorber rods) is over 40 percent less than the value of neutron fluence from the WCAP-17035-NP report, which the staff considers significant. The NRC staff observes that both the WCAP-18191-NP and WCAP-17035-NP analyses use the same methodology as in WCAP-14040-A, Revision 2, "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves," and in accordance with Regulatory Guide 1.190, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence." The WCAP-18191-NP report indicates that Tennessee Valley Authority used the DORT code with coupled BUGLE-96 cross-section library, whereas WCAP-17035-NP did not report which code and libraries were used.

In view of the significant discrepancy between the fluence results from WCAP-18191-NP and WCAP-17035-NP for Watts Bar, Unit 2, the NRC staff requires further explanation regarding the change in the reported inside surface neutron fluence for the RPV at 32 EFPY in order to complete its acceptance review of this section.

**SUBJECT: WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2 – SUPPLEMENTAL INFORMATION NEEDED FOR ACCEPTANCE OF REQUESTED LICENSING ACTION RE: AMENDMENT TO REVISE TECHNICAL SPECIFICATION 4.2.1 AND TECHNICAL SPECIFICATIONS RELATED TO FUEL STORAGE (EPID L-2017-LLA-0427) DATED FEBRUARY 6, 2018**

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