



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

April 12, 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, UNIT 2 – SUPPLEMENTAL INFORMATION
NEEDED FOR ACCEPTANCE OF REQUESTED LICENSING ACTION RE:
AMENDMENT TO FACILITY OPERATING LICENSE CONDITION RELATED TO
USE OF THE PAD4TCD CODE (EPID L-2018-LLA-0051)**

Dear Mr. Shea:

By letter dated March 5, 2018 (Agencywide Documents Access and Management System Accession No. ML18064A192), Tennessee Valley Authority submitted a license amendment request for the Watts Bar Nuclear Plant, Unit 2. The proposed amendment would revise the Watts Bar Unit 2, Facility Operating License, NPF-96, to permit continued use of the Fuel Rod Performance and Design 4 Thermal Conductivity Degradation (PAD4TCD) computer code to establish core operating limits for Watts Bar Unit 2 until the replacement of the Unit 2 steam generators.

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 amendment in terms of regulatory requirements and the protection of public health and safety and the environment.

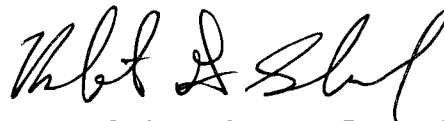
In order to make the application complete, the NRC staff requests that Tennessee Valley Authority supplement the application to address the information requested in the enclosure by April 27, 2018. This will enable the NRC staff to begin its detailed technical review. If the

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 April 3, 2018, and in a follow-up call on April 4, 2018.

If you have any questions, please contact me at 301-415-6020 or 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 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 No. 50-391

Enclosure:
Supplemental Information Needed

cc: Listserv

SUPPLEMENTAL INFORMATION NEEDED
AMENDMENT REQUEST TO REVISE FACILITY OPERATING LICENSE
RELATED TO USE OF THE PAD4TCD CODE
TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT, UNIT 2
DOCKET NO. 50-391

By letter dated March 5, 2018 (Agencywide Documents Access and Management System Accession No. ML18064A192), Tennessee Valley Authority (TVA, the licensee) submitted a license amendment request for the Watts Bar Nuclear Plant, Unit 2. The proposed amendment would revise the Watts Bar Unit 2, Facility Operating License, NPF-96, to permit continued use of the Fuel Rod Performance and Design 4 Thermal Conductivity Degradation (PAD4TCD) computer code to establish core operating limits for Watts Bar Unit 2 until the replacement of the Unit 2 steam generators.

The Watts Bar dual-unit UFSAR, Section 3.1.1, states, in part:

The Watts Bar Nuclear Plant was designed to meet the intent of the "Proposed General Design Criteria for Nuclear Power Plant Construction Permits" published in July 1967. The Watts Bar construction permit was issued in January 1973. This UFSAR, however, addresses the NRC General Design Criteria (GDC) published as Appendix A to [Title 10 *Code of Federal Regulations*] 10 CFR [Part 50] in July 1971, including Criterion 4 as amended October 27, 1987.

The Watts Bar UFSAR provides a discussion of the design features and procedures which meet the intent of the design criteria, including a discussion of any exceptions to the GDC. The GDC that are relevant to this amendment request include GDC 10, 15, 20, 25, 26 and 28. These criteria specifically require the reactor fuel, coolant, and protection systems to be designed and operated with sufficient margins of safety to limit the postulated consequences of anticipated operational occurrences and infrequent events.

The technical justification provided in the license amendment request indicates that, using input generated with PAD4TCD, the results of the Watts Bar Unit 2 emergency core cooling system (ECCS) evaluation remain within the acceptance criteria codified at 10 CFR 50.46(b). The licensee did not provide analyses or evaluations demonstrating how the remaining Updated Final Safety Analysis Report (UFSAR) Chapter 15 design basis accident and anticipated operational occurrence safety analyses account for the effects of nuclear fuel thermal conductivity degradation (TCD). Therefore, significant analyses or evaluations are missing from the amendment request, which are needed for the staff to determine whether facility operation on an indefinite basis would remain within the licensing basis acceptance criteria when accounting for the effects of TCD.

The license amendment request cites, as precedent, a similar license condition applied to the facility operating licenses for Turkey Point, Units 3 and 4 (PTN 3 and 4, respectively). This PTN 3 and 4 license condition is similarly not restricted to a number of calendar years or

Enclosure

operating cycles; however, the condition (and associated license amendment request) were approved based on analyses that dispositioned the effects of thermal conductivity degradation for both postulated LOCAs and other design basis accidents and anticipated operational occurrences. Refer to FPL letter L-2011-561 dated December 31, 2011 (Agencywide Document Access and Management System Accession No. ML12009A113), for further detail.

Sufficiency Item: Provide (a) information to demonstrate how existing, non-LOCA accident and transient analyses described in UFSAR Chapter 15 account for the effects of degradation of nuclear fuel thermal conductivity as a function of burnup, or (b) evaluations or analyses to show that Watts Bar Unit 2 facility operation remains in compliance with licensing basis acceptance criteria applicable to UFSAR Chapter 15 safety analyses (identified above), accounting for the effects of TCD.

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 USE OF THE PAD4TCD CODE (EPID L-2018-LLA-0051)
 DATED APRIL 12, 2018

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ADAMS Accession No.: ML18095A191

***by email**

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