



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

August 17, 2018

Mr. Joseph W. Shea  
Vice President, Nuclear Licensing  
Tennessee Valley Authority  
1101 Market Street, LP 4A  
Chattanooga, TN 37402-2801

**SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3; SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2; AND WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2 – SUMMARY OF REGULATORY AUDIT TO SUPPORT REVIEW OF THE LICENSE AMENDMENT REQUEST TO INCORPORATE NEW TECHNICAL SPECIFICATION FOR UNBALANCED VOLTAGE RELAYS (EPID L-2017-LLA-0391)**

Dear Mr. Shea:

By application dated November 17, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17324A349), Tennessee Valley Authority (TVA, the licensee), submitted a request for an amendment to Renewed Facility Operating License Nos. DPR-33, DPR-52, and DPR-68 for the Browns Ferry Nuclear Plant, Units 1, 2, and 3; Renewed Facility Operating License Nos. DPR-77 and DPR-79 for the Sequoyah Nuclear Plant, Units 1 and 2; and Facility Operating License Nos. NPF-90 and NPF-96 for the Watts Bar Nuclear Plant, Units 1 and 2. This license amendment request (LAR), titled "Application to Modify the Technical Specifications for the Browns Ferry Nuclear Plant (TS-512), Sequoyah Nuclear Plant (TS-17-03) and Watts Bar Nuclear Plant (TS-17-20) to Resolve the Open Phase Issue Identified in NRC Bulletin 2012-01, 'Design Vulnerability in Electrical Power System'," proposed addition of a new level of protection, "Unbalanced Voltage," to the Technical Specifications (TSs) for the loss of power instrumentation.

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the information provided by the licensee in the LAR and sent draft requests for additional information (RAIs) to TVA on March 27, 2018. On March 29, 2018, NRC staff had a conference call with TVA staff to clarify the requested information. During the conference call, the licensee stated that the discussion in the LAR related to the issues identified in Bulletin 2012-01 was for informational purposes only and not intended to document the completion of actions for vulnerabilities discussed in Bulletin 2012-01.

Due to the complexity of the proposed new TSs, supporting calculations, proposed actions, design modifications, and computer-based modeling, the NRC staff determined the need for a regulatory audit to be conducted in accordance with the Office of Nuclear Reactor Regulation Office (NRR) Instruction LIC-111, "Regulatory Audits."

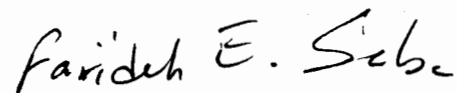
By letter dated April 20, 2018 (ADAMS Accession No. ML18103A018), the NRC staff issued its plan to conduct an audit in support of its review of the subject LAR. Subsequently, the NRC staff forwarded its revised draft RAIs to TVA on April 23, 2018, for discussion during the audit.

On May 1, 2018, and May 2, 2018, staff from NRR conducted the audit at the TVA corporate office in Chattanooga, Tennessee. The purpose of this regulatory audit was for the staff to obtain a better understanding of TVA's unique approach for resolving issues associated with Bulletin 2012-01 for TVA plants and bases for the proposed new TSs and the details on the clarifications required to evaluate the adequacy of proposed changes, and for TVA to provide better detailed responses to the RAIs. During the audit, TVA staff clarified that while reviewing the consequences of an open phase condition (OPC), a vulnerability to unbalanced voltage (UV) conditions adversely impacting safety-related busses was identified at TVA plants. The UV conditions could exist due to several initiating events, including an OPC from the offsite or onsite power systems. The existing protective relay schemes comprising of loss of voltage and degraded voltage relays were not capable of detecting UV conditions. Therefore, TVA submitted this LAR to propose installation of unique UV relays. TVA staff also clarified that a separate document will be submitted to confirm actions taken to address vulnerabilities associated with OPCs discussed in Bulletin 2012-01.

Based on the discussions with the TVA staff and review of the documents during the audit, the NRC staff revised its draft RAIs and issued the official RAIs by letter dated May 21, 2018 (ADAMS Accession No. ML18115A379). The licensee's responses to the RAIs were submitted to the NRC by letter dated June 18, 2018 (ADAMS Accession No. ML18169A404).

A list of audit participants is enclosed. If you have any questions, please contact me at (301) 415-1447 or [Farideh.Saba@nrc.gov](mailto:Farideh.Saba@nrc.gov).

Sincerely,



Farideh E. Saba, Senior Project Manager  
Plant Licensing II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-259, 50-260, 50-296,  
50-327, 50-328, 50-390, and 50-391

Enclosure:  
List of Audit Participants

cc: Listserv

LIST OF AUDIT PARTICIPANTS

<b>Name</b>	<b>Organization</b>
Jessie Quichocho	U.S. Nuclear Regulatory Commission (NRC)
Gurcharan (Singh) Matharu	NRC
Robert Schaaf	NRC
Farideh Saba (partially)*	NRC
Pete Snyder*	NRC
Edward Schrull	Tennessee Valley Authority (TVA)
Gordon Williams	TVA
Tammy Womack	TVA
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Chase Hardeman (partially)	TVA

\* By telephone

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**ADAMS Accession No.: ML18213A319**

\*by e-mail

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