



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

April 20, 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 – REGULATORY AUDIT PLAN TO SUPPORT REVIEW OF THE LICENSE AMENDMENT REQUEST TO INCORPORATE NEW TECHNICAL SPECIFICATION FOR UNBALANCED VOLTAGE RELAYS (EPID L-2017-LLA-0030)

Dear Mr. Shea:

By application dated November 17, 2017, 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) proposed addition of a new level of protection, "Unbalanced Voltage" to the Technical Specifications (TSs) for the loss of power instrumentation. The LAR was submitted by the licensee to confirm the completion of the actions taken to address the issues identified in U.S. Nuclear Regulatory Commission (NRC) Bulletin 2012-01, "Design Vulnerability in Electric Power System," dated July 27, 2012.

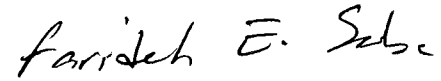
The NRC staff reviewed the information provided by the licensee in the LAR and sent a draft request for additional information to TVA on March 27, 2019. On March 29, 2018, NRC staff had a conference call with TVA staff to clarify the requested information. Due to the complexity of the proposed new TSs, supporting calculations, proposed actions, design modifications, and computer based modeling, the NRC staff has determined the need for a regulatory audit to be conducted in accordance with the Office of Nuclear Reactor Regulation Office Instruction LIC-111, "Regulatory Audits," for the NRC staff to gain a better understanding of the licensee's approach, calculations, and other aspects of the LAR. The audit plan to support the review of this LAR is enclosed.

J. Shea

- 2 -

If you have any questions, please contact me at (301) 415-1447 or Farideh.Saba@nrc.gov.

Sincerely,

A handwritten signature in black ink that reads "Farideh E. Saba". The signature is written in a cursive style with a large initial 'F' and 'S'.

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:
Audit Plan for Open Phase Condition LAR

cc: Listserv

REGULATORY AUDIT PLAN
TO SUPPORT REVIEW OF THE LICENSE AMENDMENT REQUEST
TO INCORPORATE NEW TECHNICAL SPECIFICATION
FOR UNBALANCED VOLTAGE RELAYS
TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3
DOCKET NOS. 50-259, 50-260, AND 50-296
SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2
DOCKET NOS. 50-327 AND 50-328
WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2
DOCKET NOS. 50-390 AND 50-391

1.0 BACKGROUND

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 (BFN) Units 1, 2, and 3; Renewed Facility Operating License Nos. DPR-77 and DPR-79 for the Sequoyah Nuclear Plant (SQN), Units 1 and 2; and Facility Operating License Nos. NPF-90 and NPF-96 for the Watts Bar Nuclear Plant (WBN), Units 1 and 2. This license amendment request (LAR) proposed addition of a new level of protection, "Unbalanced Voltage" to the Technical Specifications (TSs) for the loss of power instrumentation. The LAR was submitted by the licensee to confirm the completion of the actions taken to address the issues identified in U.S. Nuclear Regulatory Commission (NRC) Bulletin 2012-01, "Design Vulnerability in Electric Power System," dated July 27, 2012 (ADAMS Accession No. ML12074A115).

The NRC staff reviewed the information provided by the licensee in the LAR and sent a draft request for additional information to TVA on March 27, 2019. On March 29, 2018, NRC staff had a conference call with TVA staff to clarify the requested information. Due to the complexity of the proposed new TSs, supporting calculations, proposed actions, design modifications, and computer based modeling, the NRC staff has determined the need for a regulatory audit to be conducted in accordance with the Office of Nuclear Reactor Regulation Office Instruction LIC-111, "Regulatory Audits" (ADAMS Accession No. ML082900195), for the NRC staff to gain a better understanding of the licensee's approach, calculations, and other aspects of the LAR.

2.0 REGULATORY AUDIT BASES

A regulatory audit is a planned license or regulation-related activity that includes the examination and evaluation of primarily non-docketed information. A regulatory audit is conducted with the intent to gain understanding, to verify information and/or to identify information that will require docketing to support the basis for the licensing or regulatory decision.

NRC Regulatory Requirements

The regulatory bases for the audit are described in Final Safety Analysis Report (FSAR) of the TVA Plants (BFN, SQN and WBN). Components comply with Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants" (as stated in FSAR Sections 3.1) and 10 CFR 50.36.

- Criterion 17 - "Electric Power Systems"
- Criterion 18- "Inspection and Testing of Electric Power Systems"

(NOTE: For BFN units the corresponding Atomic Energy Commission Criteria are applicable)

3.0 REGULATORY AUDIT SCOPE/METHODOLOGY

The purpose of this regulatory audit is 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 the licensee's bases for the proposed new TSs. Also, for TVA to provide better responses to the staff RAIs. The areas of focus for the audit are the TVA approach for protecting the safety related equipment, calculation methodologies, assumptions, and results used to reach conclusions for the proposed TS changes and resolution of Open Phase Condition vulnerability identified in NRC Bulletin 2012-01, "Design Vulnerability in Electric Power System," dated July 27, 2012 (ML12074A115).

3.0 DURATION OF AUDIT

The audit will start on May 1, 2018, and may continue until the NRC Safety Evaluation is issued. The audit entrance will be held via a conference call or face-to-face at the designated office facility. A site visit plan will be issued if additional information is needed for an audit at a specific site/location. There will be an exit meeting at the end of any face-to-face audit. An overall audit exit meeting via a teleconference or at an appropriate audit facility will be held at the conclusion of the audit. The NRC staff will develop an audit summary report to document its observations and conclusions within 30 days of the conclusion of the audit.

4.0 INFORMATION NECESSARY FOR THE REGULATORY AUDIT

The licensee is requested to provide the NRC staff the documents listed in the Reference section via an e-mail or using its portal that is accessible to the NRC staff. Hard copies of the documents may be presented during the face-face meetings. Two hard-copy sets of 17 inch by 22 inch drawings are acceptable.

The licensee is requested to make its personnel or contractors who are familiar with the design of electrical systems available for the audit (either in-person or on the phone). The

licensee is requested to be prepared to discuss its draft responses to the staff questions, which will be transmitted to the TVA point of contact by e-mails regarding resolution to open phase conditions at TVA plants program. Supporting calculations, drawings, design modifications, and ETAP models, should be accessible to the NRC staff during the audit.

Additional information requests identified during the audit will be communicated to the TVA designated point of contact.

5.0 TEAM ASSIGNMENTS/RESOURCE ESTIMATES

The NRC staff performing this audit will be:

- Jessie Quichocho, Branch Chief, Division of Engineering, Electrical Engineering Operating Reactor Branch (EEOB)
- Gurcharan (Singh) Matharu, Technical Reviewer, EEOB
- Farideh Saba/Robert Schaaf, Project Manager, Division of Operating Reactor Licensing, Plant Licensing Branch II-2

The following additional NRC staff may also support the audit team:

- Pete Snyder, Technical Reviewer, Division of Safety Systems, Technical Specifications Branch

6.0 LOGISTICS

The audit will be conducted with the licensee at the EXCEL Services Corporation facility in Rockville, Maryland, at the TVA Corporate office in Chattanooga, TN, or at other locations as appropriate. TVA will make relevant information available in an online information portal or hard copies, as appropriate, and will provide rooms and space as necessary if site visits are needed. Meetings, site visits, and teleconferences will be held as necessary for clarification of information and determination of supplemental information to be docketed to support the NRC staff's review. Our tentative schedule for a 1½ day face-to-face audit is provided in the following table:

Audit Agenda

Date	Time	Item	Responsibility
1st day	1:00 p.m. - 2:00 p.m.	Entrance meeting, introductions, discuss purpose and objectives of audit	TVA/NRC
	2:00 p.m. - 3:00 p.m.	Overview of LAR and proposed new TS. Overview of supporting calculations, drawing, and other documents (supporting documents).	TVA
	3:00 p.m. - 3:15 p.m.	Break	
	3:15 p.m. - 4:30 p.m.	Discussion of the NRC staff questions and TVA potential responses, including review of the supporting documents.	NRC/TVA
	4:30 p.m. - 5:00 p.m.	Summarize the status and areas for further discussion	NRC/TVA
2 nd day	8:30 a.m. - 12:00 p.m.	Continued - Discussion of the staff questions and TVA potential responses, including supporting documents.	NRC/TVA
	12:00 p.m. - 1:00 p.m.	Lunch	
	1:00 p.m. - 4:00 p.m.	Continued - Discussion of the staff's questions and TVA's potential responses, including supporting documents.	NRC/TVA
	4:00 p.m. - 4:30 p.m.	NRC audit summary with headquarters management*	NRC
	4:30 p.m. - 5:00 p.m.	NRC site exit and closing remarks**	NRC/TVA

* If Needed

** Audit exit may be adjusted based on NRC staff progress.

7.0 REFERENCES

TVA calculations (primary focus of audit) and drawings:

- TVA calculations for each Plant
- ETAP software loadflow voltage drop analysis/drawings (output)
- TVA calculations and drawings for support of plant modifications
- Single line diagrams Class 1E and offsite power electrical systems and related control wiring diagrams
- Details on ABB relays
- Other supporting calculations (as determined by TVA and NRC staffs)

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ADAMS Accession No.: ML18103A018

***by email**

OFFICE	DORL/LPLII-2/PM	DORL/LPLII-2/LA	DE/EEOB/BC *	DORL/LPLII-2/BC(A)	DORL/LPLII-2/PM
NAME	FSaba	BClayton	JQuichocho	BTindell	FSaba
DATE	04/19/2018	04/18/2018	04/17/2018	04/20/2018	04/20/2018

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