



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-15-019

March 9, 2015

10 CFR 50.90

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Browns Ferry Nuclear Plant, Unit 1  
Renewed Facility Operating License No. DPR-33  
NRC Docket No. 50-259

Subject: **License Amendment Request for the Adoption of Technical Specifications Task Force (TSTF) Traveler TSTF-460-A, Revision 0, "Control Rod Scram Time Testing Frequency" (TS-501)**

- References:
- 1) Transmittal of TSTF-460, Revision 0, "Control Rod Scram Time Testing Frequency," dated September 17, 2003 [ADAMS Accession No. ML033350006]
  - 2) Federal Register Notice, Notice of Availability published on August 23, 2004 (69 FR 51864)
  - 3) Letter from William D. Crouch (TVA) to the U.S. Nuclear Regulatory Commission, "Browns Ferry Nuclear Plant - Units 1, 2, and 3 - Technical Specifications Change 450 - Application for Technical Specification Improvement to Revise Control of Scram Time Testing Frequency," dated July 29, 2005 [ADAMS Accession No. ML052220325]
  - 4) Letter from Michael L. Marshall, Jr (NRC) to Karl W. Singer (TVA CNO) "Browns Ferry Nuclear Plant, Unit 1 - Acceptance Review Results of License Amendment Request Regarding Revision to Control Rod Scram Time Testing Frequency (TS-450)," dated September 20, 2005 [ADAMS Accession No. ML052360292]

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50.90, "Application for amendment of license, construction permit, or early site permit," Tennessee Valley Authority (TVA) is submitting a request for an amendment to the Technical Specifications (TS) for Browns Ferry Nuclear Plant (BFN) Unit 1.

The proposed license amendment revises the TS testing frequency for the surveillance requirement (SR) in TS 3.1.4, "Control Rod Scram Times."

The proposed change is consistent with Technical Specifications Task Force (TSTF) Traveler TSTF-460-A, Revision 0, "Control Rod Scram Time Testing Frequency" (Reference 1), which was approved generically for the boiling water reactor (BWR) Standard TS, NUREG-1433 (BWR/4). The required frequency of SR 3.1.4.2, control rod scram time testing, is changed from "120 days cumulative operation in MODE 1" to "200 days cumulative operation in MODE 1."

The availability of this TS improvement was announced in the *Federal Register* on August 23, 2004 (69 FR 51864) (Reference 2) as part of the consolidated line item improvement process (CLIP).

TVA previously submitted a similar License Amendment Request (LAR) for BFN Unit 1 as part of a joint BFN Units 1, 2, and 3 Application for TS Change (TS-450) on July 29, 2005 (Reference 3). The NRC Acceptance Review Results for BFN Unit 1 (Reference 4) noted that, given the shutdown of BFN Unit 1 since 1985, with scheduled return to service in 2007, "the information presented for Unit 1 does not support review of this request under the CLIP, as no actual plant-specific data for Unit 1 was provided."

This letter resubmits that application for a BFN Unit 1 TS change with plant-specific data as required by TSTF-460-A.

Enclosure 1 of this letter provides the description, proposed change, technical analysis, regulatory analysis, and a discussion of environmental considerations. The attachments to the Enclosure 1 provide the existing facility operating license pages and Bases marked to show the proposed change (Attachments 1 and 2) and revised (final typed) pages (Attachments 3 and 4).

In accordance with 10 CFR 50.91(a) (1), "Notice for Public Comment," the analysis about the issue of no significant hazards consideration using the standards in 10 CFR 50.92 is being provided to the Commission in the regulatory analysis section of the Enclosure 1.

In accordance with 10 CFR 50.91(b) (1), "Notice for Public Comment; State Consultation," a copy of this application and its reasoned analysis about no significant hazards considerations is being provided to the Alabama Department of Public Health.

TVA requests review and approval of the proposed license amendment by September 30, 2015 and requests the implementation date be specified as within 60 days of the approval date.

There is one new regulatory commitment associated with this submittal.

Please direct any questions concerning this matter to Mr. Edward D. Schrull at (423) 751-3850.

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I declare under penalty of perjury that the foregoing is true and correct. Executed on the 9th day of March 2015.

Respectfully,

A handwritten signature in black ink, appearing to read "J. W. Shea".

J. W. Shea  
Vice President, Nuclear Licensing

- Enclosure
- 1) Evaluation of Proposed Change, Browns Ferry Nuclear Plant Unit 1 Application to Adopt TSTF-460-A, "Control Rod Scram Time Testing Frequency" (TS-501)
  - 2) Regulatory Commitment

cc (w/Enclosures):

NRC Regional Administrator - Region II  
NRR Director - NRC Headquarters  
NRC Senior Resident Inspector - Browns Ferry Nuclear Plant  
NRR Project Manager - Browns Ferry Nuclear Plant  
State Health Officer – Alabama Department of Public Health

Enclosure 1  
Evaluation of Proposed Change  
Browns Ferry Nuclear Plant Unit 1 Application to Adopt TSTF-460-A,  
“Control Rod Scram Time Testing Frequency”  
(TS-501)

- 1.0 SUMMARY DESCRIPTION
- 2.0 DETAILED DESCRIPTION
  - 2.1 Proposed Changes
  - 2.2 Need for Proposed Changes
- 3.0 BACKGROUND
- 4.0 REGULATORY REQUIREMENTS AND GUIDANCE
- 5.0 TECHNICAL ANALYSIS
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- 7.0 NO SIGNIFICANT HAZARDS CONSIDERATION
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Enclosure 1  
Evaluation of Proposed Change

## 1.0 SUMMARY DESCRIPTION

The proposed change revises the required testing frequency for the surveillance requirement (SR) in Technical Specifications (TS) 3.1.4, "Control Rod Scram Times," from 120 days cumulative operation in MODE 1 to 200 days cumulative operation in MODE 1. This change is consistent with U.S. Nuclear Regulatory Commission (NRC) approved Technical Specifications Task Force (TSTF) Standard Technical Specifications (STS) Change Traveler TSTF-460-A, Revision 0, "Control Rod Scram Time Testing Frequency" (Reference 1). The availability of this TS improvement was announced in the *Federal Register* on August 23, 2004, (69 FR 51854) (Reference 2) as part of the consolidated line item improvement process (CLIIP).

This proposed change will update TS 3.1.4 to be consistent with NUREG-1433, Revision 4 (Reference 3).

## 2.0 DETAILED DESCRIPTION

### 2.1 Proposed Changes

The proposed change revises TS 3.1.4, "Control Rod Scram Times," based on TSTF Change Traveler TSTF-460-A, Revision 0, that has been approved generically for the boiling water reactor (BWR) Standard TS, NUREG-1433 (BWR/4). The required frequency of SR 3.1.4.2, control rod scram time testing, is changed from "120 days cumulative operation in MODE 1" to "200 days cumulative operation in MODE 1." The 200 day frequency is based on operating experience that has shown control rod scram times do not significantly change over an operating cycle.

Revisions to the TS Bases are also included in this application for information, as shown in Attachments 2 and 4 to this enclosure. The Bases are revised to reference the new frequency and to reduce the percentage of the tested rods which can be "slow" from 20% to 7.5%.

### 2.2 Need for Proposed Changes

The proposed change will restore BFN Unit 1 consistency with BFN Units 2 and 3 TS and BWR/4 Standard TS, NUREG-1433 Rev. 4.

The Tennessee Valley Authority (TVA) previously submitted a similar License Amendment Request (LAR) for BFN Unit 1 as part of a joint BFN Units 1, 2, and 3 Application for TS Change TS-450 on July 29, 2005 (Reference 4), "Application for Technical Specification Improvement to Revise Control Rod Scram Time Testing Frequency." The NRC Acceptance Review for BFN Unit 1 (Reference 5) noted that, given the shutdown status of BFN Unit 1 since 1985, with scheduled return to service not until 2007, "the information presented for Unit 1 does not support review of this request under the CLIIP, as no actual plant-specific data for Unit 1 was provided."

The LAR TS-450 was subsequently approved for implementation for BFN Units 2 and 3 on January 9, 2006 (Reference 6).

This LAR (TS-501) resubmits that Control Rod Scram Time Testing Frequency amendment request for BFN Unit 1 with plant-specific data as required by TSTF-460-A.

Enclosure 1  
Evaluation of Proposed Change

### **3.0 BACKGROUND**

The background for this application is addressed by the CLIP Notice of Availability published on August 23, 2004 (69 FR 51854) and TSTF-460-A, Rev. 0.

### **4.0 REGULATORY REQUIREMENTS AND GUIDANCE**

The applicable regulatory requirements and guidance associated with this application are addressed by the CLIP Notice of Availability published on August 23, 2004 (69 FR 51864) and TSTF-460-A, Rev.0.

### **5.0 TECHNICAL ANALYSIS**

TVA has reviewed the safety evaluation (SE) published on August 23, 2004 (69 FR 51854) as part of the CLIP Notice of Availability. This verification included a review of the NRC staff's SE and the supporting information provided to support TSTF-460-A. TVA has concluded that the justifications presented in the TSTF proposal and the SE prepared by the NRC staff are applicable to BFN Unit 1 and justify this amendment for the incorporation of the changes to the BFN Unit 1 TS.

As described in the CLIP model SE, part of the justification for the change in surveillance frequency is the high reliability of the BFN Unit 1 control rod drive system. As requested in the notice of availability published on August 23, 2004 (69 FR 51854), the historical performance of the control rod drive system at BFN Unit 1 is as follows:

The control rod insertion time test results at BFN Unit 1 have shown the control rod scram rates to be highly reliable with scram rates that do not significantly change over an operating cycle. During the most recent eight years of operation, out of 2,475 control rod insertion tests, only one control rod has been slower than the insertion time limit. The extensive historical database substantiates the claim of high reliability of the BFN Unit 1 control rod drive system. The current TS requires that 10 percent of the BFN Unit 1 control rods, or 19 rods, be tested via sampling every 120 cumulative days of operation in MODE 1.

### **6.0 COMMITMENTS**

As discussed in the CLIP model SE published in the Federal Register on August 23, 2004 (69 FR 51854) for this TS improvement, TVA is making the following regulatory commitment with the understanding that the NRC will include it as a condition for the issuance of the requested amendment:

TVA will incorporate the revised acceptance criterion value of 7.5 percent into the TS Bases for BFN Unit 1 in accordance with the Bases Control Program described in TS 5.5.10.

Enclosure 1  
Evaluation of Proposed Change

## **7.0 NO SIGNIFICANT HAZARDS CONSIDERATION**

The Tennessee Valley Authority (TVA) has reviewed the proposed no significant hazards consideration determination published on August 23, 2004, (69 FR 51854) as part of the CLIIP. TVA has concluded that the proposed determination presented in the notice is applicable to BFN Unit 1 and the determination is hereby incorporated by reference to satisfy the requirements of 10 CFR 50.91(a).

## **8.0 ENVIRONMENTAL EVALUATION**

TVA has reviewed the environmental evaluation included in the model SE published on August 23, 2004 (69 FR 51854) as part of the CLIIP. TVA has concluded that the staff's findings presented in that evaluation are applicable to BFN Unit 1 and the evaluation is hereby incorporated by reference for this application.

## **9.0 PRECEDENT**

This application is being made in accordance with the CLIIP. TVA is not proposing variations or deviations from the TS changes described in TSTF-460-A or the NRC staff's model SE published on August 23, 2004 (69 FR 51854).

## **10.0 REFERENCES**

1. Technical Specifications Task Force (TSTF)-460, Revision 0, "Control Rod Scram Time Testing Frequency," dated September 17, 2003 [ADAMS Accession No. ML033350006]
2. Federal Register Notice, Notice of Availability, published on August 23, 2004 (69 FR 51864)
3. NUREG-1433, Revision 4, "Standard Technical Specifications, General Electric BWR/4 Plants," dated April 2012 [ADAMS Accession No. ML12104A192]
4. Letter from William D. Crouch (TVA) to the U.S. Nuclear Regulatory Commission, "Browns Ferry Nuclear Plant - Units 1, 2, and 3 - Technical Specifications Change 450, Application for Technical Specification Improvement to Revise Control of Scram Time Testing Frequency," dated July 29, 2005 [ADAMS Accession No. ML052220325]
5. Letter from Michael L. Marshall, Jr (NRC) to Karl W. Singer (TVA CNO), "Browns Ferry Nuclear Plant, Unit 1 - Acceptance Review Results of License Amendment Request Regarding Revision to Control Rod Scram Time Testing Frequency (TS-450)," dated September 20, 2005 [ADAMS Accession No. ML052360292]
6. Letter from Eva A. Brown (NRC) to Karl W. Singer (TVA CNO), "Browns Ferry Nuclear Plant, Units 2 and 3 - Issuance of Amendments Regarding Technical Specification Improvement to Revise Control Rod Scram Time Testing Frequency (TAC Nos. MC8037 and MC8038)," dated January 9, 2006 [ADAMS Accession No. ML060110296]

ATTACHMENT 1

Marked up Proposed Technical Specification Pages



SURVEILLANCE REQUIREMENTS

-----NOTE-----

During single control rod scram time Surveillances, the control rod drive (CRD) pumps shall be isolated from the associated scram accumulator.

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SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify each control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure $\geq$ 800 psig.	Prior to exceeding 40% RTP after each reactor shutdown $\geq$ 120 days
SR 3.1.4.2	Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure $\geq$ 800 psig.	<del>120</del> days cumulative operation in MODE 1

(continued)

200

ATTACHMENT 2

Marked up Proposed Technical Specification Bases Pages

BASES

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SURVEILLANCE  
REQUIREMENTS  
(continued)

SR 3.1.4.2

Additional testing of a sample of control rods is required to verify the continued performance of the scram function during the cycle. A representative sample contains at least 10% of the control rods. This sample remains representative if no more than ~~20%~~ of the control rods in the sample tested are determined to be "slow." With more than ~~20%~~ of the sample declared to be "slow" per the criteria in Table 3.1.4-1, additional control rods are tested until this ~~20%~~ criterion (i.e., ~~20%~~ of the entire sample) is satisfied, or until the total number of "slow" control rods (throughout the core from all Surveillances) exceeds the LCO limit. For planned testing, the control rods selected for the sample should be different for each test. Data from inadvertent scrams should be used whenever possible to avoid unnecessary testing at power, even if the control rods with data may have been previously tested in a sample. The ~~120~~ day Frequency is based on operating experience that has shown control rod scram times do not significantly change over an operating cycle. This Frequency is also reasonable based on the additional Surveillances done on the CRDs at more frequent intervals in accordance with LCO 3.1.3 and LCO 3.1.5, "Control Rod Scram Accumulators."

200

7.5%

(continued)

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ATTACHMENT 3

Final Typed Revised Technical Specification Pages

- (3) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use at any time any byproduct, source, and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
- (4) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use in amounts as required any byproduct, source, or special nuclear material without restriction to chemical or physical form for sample analysis or equipment and instrument calibration or associated with radioactive apparatus or components;
- (5) Pursuant to the Act and 10 CFR Parts 30 and 70, to possess but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 3458 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. , are hereby incorporated in the renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

For Surveillance Requirements (SRs) that are new in Amendment 234 to Facility Operating License DPR-33, the first performance is due at the end of the first surveillance interval that begins at implementation of the Amendment 234. For SRs that existed prior to Amendment 234, including SRs with modified acceptance criteria and SRs whose frequency of performance is being extended, the first performance is due at the end of the first surveillance interval that begins on the date the surveillance was last performed prior to implementation of Amendment 234.

SURVEILLANCE REQUIREMENTS

-----NOTE-----  
 During single control rod scram time Surveillances, the control rod drive (CRD) pumps shall be isolated from the associated scram accumulator.  
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SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify each control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure $\geq$ 800 psig.	Prior to exceeding 40% RTP after each reactor shutdown $\geq$ 120 days
SR 3.1.4.2	Verify, for a representative sample, each tested control rod scram time is within the limits of Table 3.1.4-1 with reactor steam dome pressure $\geq$ 800 psig.	200 days cumulative operation in MODE 1

(continued)

ATTACHMENT 4

Final Typed Revised Technical Specification Bases Pages

BASES

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SURVEILLANCE  
REQUIREMENTS  
(continued)

SR 3.1.4.2

Additional testing of a sample of control rods is required to verify the continued performance of the scram function during the cycle. A representative sample contains at least 10% of the control rods. This sample remains representative if no more than 7.5% of the control rods in the sample tested are determined to be "slow." With more than 7.5% of the sample declared to be "slow" per the criteria in Table 3.1.4-1, additional control rods are tested until this 7.5% criterion (i.e., 7.5% of the entire sample) is satisfied, or until the total number of "slow" control rods (throughout the core from all Surveillances) exceeds the LCO limit. For planned testing, the control rods selected for the sample should be different for each test. Data from inadvertent scrams should be used whenever possible to avoid unnecessary testing at power, even if the control rods with data may have been previously tested in a sample. The 200 day Frequency is based on operating experience that has shown control rod scram times do not significantly change over an operating cycle. This Frequency is also reasonable based on the additional Surveillances done on the CRDs at more frequent intervals in accordance with LCO 3.1.3 and LCO 3.1.5, "Control Rod Scram Accumulators."

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Enclosure 2

License Amendment Request for Adoption of TSTF-460-A,  
Control Rod Scram Time Testing Frequency  
(TS-501)

**Regulatory Commitment**

<b>COMMITMENT</b>	<b>COMPLETION DATE</b>
TVA will incorporate the revised acceptance criterion value of 7.5 percent into the TS Bases for BFN Unit 1 in accordance with the Bases Control Program described in TS 5.5.10.	Sixty days following issuance of the License Amendment approving the TS-501 request to adopt TSTF-460-A, Revision 0, "Control Rod Scram Time Testing Frequency"