



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

September 29, 2015

Mr. Joseph W. Shea  
Vice President, Nuclear Licensing  
Tennessee Valley Authority  
1101 Market Street, LP 3R-C  
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNIT 1 - ISSUANCE OF AMENDMENT  
REGARDING CONTROL ROD SCRAM TIME TESTING FREQUENCY PER  
TSTF-460, REVISION 0 (TAC NO. MF5827)

Dear Mr. Shea:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 289 to Renewed Facility Operating License No. DPR-33 for Browns Ferry Nuclear Plant, Unit 1. This amendment is in response to Tennessee Valley Authority's application dated March 9, 2015, as supplemented by letter dated August 19, 2015.

The amendment revises Technical Specification (TS) 3.1.4, "Control Rod Scram Times," based on Technical Specification Task Force Change Traveler-460, Revision 0, "Control Rod Scram Time Testing Frequency," revising the frequency of Surveillance Requirement 3.1.4.2 regarding control rod scram time testing from "120 days cumulative operation in MODE 1" to "200 days cumulative operation in MODE 1." Implementation of this amendment will also include incorporation of the revised acceptance criterion value of 7.5 percent for "slow" control rods into the TS Bases.

J. Shea

- 2 -

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's Biweekly *Federal Register* Notice.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ach Hon for', written in a cursive style.

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

Docket No. 50-259

Enclosures:

1. Amendment No. 289 to DPR-33
2. Safety Evaluation

cc w/enclosures: Distribution via Listserv



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-259

BROWNS FERRY NUCLEAR PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 289  
Renewed License No. DPR-33

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Tennessee Valley Authority (TVA, the licensee) dated March 9, 2015, as supplemented by letter dated August 19, 2015, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-33 is hereby amended as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No.289 are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days. TVA will incorporate the revised acceptance criterion value of 7.5 percent into the Technical Specification (TS) Bases for Browns Ferry Nuclear Plant, Unit 1, in accordance with the Bases Control Program described in TS 5.5.10.

FOR THE NUCLEAR REGULATORY COMMISSION



Shana R. Helton, Chief  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Operating License  
and Technical Specifications

Date of Issuance: September 29, 2015

ATTACHMENT TO LICENSE AMENDMENT NO. 289  
RENEWED FACILITY OPERATING LICENSE NO. DPR-33  
DOCKET NO. 50-259

Replace the following page of the Renewed Facility Operating License with the revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

REMOVE  
3

INSERT  
3

Replace the following page of Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

REMOVE  
3.1-13

INSERT  
3.1-13

- (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. 289, 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.

-----

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)



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 289

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-33

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR POWER PLANT, UNIT 1

DOCKET NO. 50-259

1.0 INTRODUCTION

By letter dated March 9, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15111A396), as supplemented by letter dated August 19, 2015 (ADAMS Accession No. 15231A245), Tennessee Valley Authority (TVA, the licensee) submitted a license amendment request regarding Browns Ferry Nuclear Plant (BFN), Unit 1, to amend Technical Specification (TS) 3.1.4, "Control Rod Scram Times." The proposed amendment is based on Technical Specification Task Force Change Traveier-460, Revision 0, which has been approved generically for the Standard Technical Specifications, Boiling Water Reactor (BWR) - NUREG-1433 (BWR/4) and NUREG-1434 (BWR/6), by revising the frequency of Surveillance Requirement (SR) 3.1.4.2, control rod scram time testing, from "120 days cumulative operation in MODE 1" to "200 days cumulative operation in MODE 1." A notice announcing the availability of this proposed TS change using the consolidated line item improvement process was published in the *Federal Register* on August 23, 2004 (69 FR 51864).

The supplemental letter dated August 19, 2015, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original no significant hazards consideration determination.

2.0 REGULATORY EVALUATION

The U.S. Nuclear Regulatory Commission's (NRC's) requirement in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.36(c)(3) states that TSs will include surveillance requirements "relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."



The TS governing the control rod scram time surveillance is intended to assure proper function of control rod insertion. Following each refueling outage, all control rod scram times are verified. In addition, periodically during power operation, a representative sample of control rods is selected to be inserted to verify the insertion speed. A representative sample is defined as a sample containing at least 10 percent of the total number of control rods. The current TS stipulates that no more than 20 percent of the control rods in this representative sample can be "slow" during the post-outage testing. With more than 20 percent of the sample declared to be "slow" per the criteria in Table 3.1.4-1, additional control rods are tested until this 20 percent criterion (e.g., 20 percent of the entire sample size) is satisfied, or until the total number of "slow" control rods (throughout the core, from all surveillances) exceeds the limiting condition for operation limit. For planned testing, the control rods selected for the sample should be different for each test. The acceptance criterion for at-power surveillance testing has been redefined from 20 percent to 7.5 percent. This tightened acceptance criterion for at-power surveillance aligns with the TS 3.1.4 requirement for the total control rods allowed to have scram times exceeding the specified limit.

The proposed change does not affect any current operability requirements, and the test frequency being revised is not specified in regulations. As a result, no regulatory requirements or criteria are affected.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Description of Proposed Change

BFN, Unit 1, SR 3.1.4.2 states, "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."

SR 3.1.4.2 has a frequency of "120 days cumulative operation in MODE 1." The proposed change revises the frequency to "200 days cumulative operation in MODE 1." The TS Bases are revised to reference the new frequency and to reduce the percentage of the tested rods which can be "slow" from 20 percent to 7.5 percent.

#### 3.2 Evaluation of Proposed Change

The licensee stated the following:

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.

The NRC staff requested that TVA provide information regarding any significant changes in hardware or testing practices that could influence these test results. In its August 19, 2015, response, the licensee described two changes in the data recording process in which manual

data manipulations were replaced with automated data manipulation methods. The NRC staff reviewed the licensee's description of these changes and concluded that the changes do not impact the test data and do not invalidate the conclusions regarding high reliability of the control rod drive system.

The current TS states that the acceptance criteria have been met if 20 percent or fewer of the sample control rods that are tested are found to be slow. The acceptance criterion has been redefined for at-power surveillance testing from 20 percent to 7.5 percent when the surveillance period is extended to 200 cumulative days of operation in MODE 1. This tightened acceptance criterion for at-power surveillance aligns with the TS 3.1.4 requirement for the total control rods allowed to have scram times exceeding the specified limit.

The licensee has committed to incorporate the revised acceptance criterion value of 7.5 percent into the TS Bases in accordance with the licensee's Bases Control Program and as a condition of this license amendment. The NRC staff had stated in the August 23, 2004, *Federal Register* notice how such commitment will be implemented:

Conditioning of the license amendment is accomplished by including wording similar to the following in the implementation language (typically included as item 3) in the Amendment of Facility Operating License: This license amendment is effective as of its date of issuance and shall be implemented within [XX] days from the date of issuance. The licensee shall incorporate during the next periodic update into the TS Bases Section the changes described in its application dated [Date].

Accordingly, the implementation statement of this amendment will have a statement as proposed by the licensee:

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.

The NRC staff considers the extended surveillance interval to be justified by the demonstrated reliability of the control rod insertion system, based on historical control rod scram time test data, and by the more restrictive acceptance criterion for the number of slow rods allowed during at-power surveillance testing. The NRC staff finds the proposed TS change acceptable.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Alabama State official was notified of the proposed issuance of the amendment. The State official had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes SRs. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite,

and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (80 FR 32629). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

## 6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by the operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: M. Chernoff

Date: September 29, 2015

J. Shea

- 2 -

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's Biweekly *Federal Register* Notice.

Sincerely,

***/RA/ AHon for***

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

Docket No. 50-259

Enclosures:

1. Amendment No. 289 to DPR-33
2. Safety Evaluation

cc w/enclosures: Distribution via Listserv

**DISTRIBUTION:**

PUBLIC

LPL2-2 R/F

RidsNrrDorlLpl2-2

RidsNrrDssScvb

RidsACRS\_MailCTR

RidsNrrPMBrownsFerry

RidsNrrDorlDpr

RidsNrrLABClayton

RidsNrrDssStsb

RidsRgn2MailCenter

PTam, NRR

JRobinson, NRR

RidsNrrDraAfpb

MChernoff, NRR

RidsNrrDraApla

**ADAMS Accession No.: ML15251A540** \*by memo dated 9/4/15

\*\*OGC review is not needed per memo by T. Kobetz dated 10/29/07.

OFFICE	DORL/LPLII-2/PM	DORL/LPLII-2/LA	DSS/STSB/BC*
NAME	(PTam for) FSaba	(LRonewicz for) BClayton	RElliott
DATE	9/18/2015	9/16/2015	9/04/2015
OFFICE	OGC**	DORL/LPLII-2/BC	DORL/LPLII-2/PM
NAME	**	SHelton	(AHon for) FSaba
DATE	**	9/25/2015	9/29/2015

**OFFICIAL RECORD COPY**