



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II**

245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

April 20, 2016

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

**SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNIT 3 – U.S. NUCLEAR REGULATORY  
COMMISSION POST-APPROVAL SITE INSPECTION FOR LICENSE RENEWAL,  
INSPECTION REPORT 05000296/2016009**

Dear Mr. Shea:

On March 11, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed a Post-Approval Site Inspection for License Renewal at your Browns Ferry Nuclear Plant, Unit 3. The enclosed report documents the inspection results that were discussed on March 11, 2016, with Kevin Bronson, Sr. Vice President, and members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules, regulations, and conditions of your license. The inspectors reviewed selected procedures, records, observed activities, and interviewed personnel.

Based on the results of this inspection, no findings were identified.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public inspections, exemptions, requests for withholding" of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its Enclosure, and your response (if any), will be available electronically for public inspection in the NRC Public Document Room, or from the Publicly Available Records (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS); accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Shakur A. Walker, Chief  
Engineering Branch 3  
Division of Reactor Safety

Docket No. 50-296  
License No. DPR-68

Enclosure:  
NRC Inspection Report 05000296/2016009  
w/Attachment: Supplementary Information

cc: Distribution via Listserv

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PUBLICLY AVAILABLE       NON-PUBLICLY AVAILABLE       SENSITIVE       NON-SENSITIVE

ADAMS:  Yes      ACCESSION NUMBER: \_\_\_\_\_       SUNSI REVIEW COMPLETE       FORM 665 ATTACHED

OFFICE	RII:DRS/EB3	RII:DRS/EB3					
SIGNATURE	4/7/2016	4/20/2016					
NAME	P. Cooper	S. Walker					
DATE	4/7/2016	4/20/2016					
E-MAIL COPY	YES NO	YES NO					

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No: 05000296

License No: DPR-68

Report No: 05000296/2016009

Licensee: Tennessee Valley Authority

Facility: Browns Ferry Nuclear Plant, Unit 3

Location: Athens, AL 35611

Dates: March 7–11, 2016

Inspector: P. Cooper, Reactor Inspector

Approved by: Shakur Walker, Branch Chief  
Engineering Branch 3  
Division of Reactor Safety

Enclosure

## **SUMMARY**

Inspection Report (IR) 05000296/2016009; 3/7/2016 – 3/11/2016; Browns Ferry Nuclear Plant, Unit 3; Post-Approval Site Inspection for License Renewal.

The report covers an inspection conducted by regional inspectors in accordance with the U.S. Nuclear Regulatory Commission (NRC) Inspector Manual Chapter (IMC) 2515, and NRC Inspection Procedure 71003, Post-Approval Site Inspection for License Renewal, dated February 25, 2013.

Based on the sample selected for review, the inspectors determined that commitments, license conditions, and regulatory requirements associated with the renewed facility operating license were either being met, or where commitment actions had not been completed, that the licensee had administrative controls in place to ensure completion before the period of extended operation.

The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

No findings were identified during this inspection.

## REPORT DETAILS

### 4. OTHER ACTIVITIES

#### 4OA5 Other Activities

##### .1 Post-Approval Site Inspection for License Renewal (Phase 1)

###### a. Inspection Scope

Implementation of License Conditions and Commitments, including Aging Management Programs: The inspectors reviewed a sample of license renewal activities scheduled for the Unit 3 Spring 2016 refueling outage, which was the last outage prior to the period of extended operation (PEO). The objective of the inspection was to maximize observations of the actual implementation of license renewal activities before the beginning of the PEO (July 16, 2016), and verify that the licensee completed the necessary actions to: (a) comply with the conditions stipulated in the renewed facility operating license; (b) meet the license renewal commitments described in NUREG-1843, "Safety Evaluation Report (SER) Related to the License Renewal of the Browns Ferry Nuclear Plant, Units 1, 2, and 3" (ADAMS Accession Number ML060120453); and (c) meet the future activities, including Aging Management Programs (AMPs), described in the Updated Final Safety Analysis Report (UFSAR) supplement submitted pursuant to 10 CFR 54.21(d).

The inspectors performed a walkdown of the Unit 3 Drywell to assess general conditions of civil engineering structures and components with regard to age-related issues. The inspectors also observed visual examinations being performed on the Reactor Pressure Vessel top guide beams.

The inspectors reviewed supporting documents; conducted interviews with licensee staff; observed in-process outage activities; and performed visual inspection of structures, systems, and components (SSCs) including those not accessible during power operation. The commitment items and AMPs selected for the inspection sample are summarized below based on their description in Appendix A of the License Renewal Application. The specific inspection activities conducted for each AMP are also described below. Specific documents reviewed are also listed in the report Attachment.

#### Commitment Item 12 – Boiling Water Reactor Vessel Internals Program

This commitment specified that the licensee will (a) inspect the reactor top guide beams prior to the PEO, and (b) implement the inspection of jet pump thermal sleeve weld TS-2 when the inspection technique is developed by the boiling water reactors vessel and internals project (BWRVIP) inspection committee.

With regard to the top guide beam inspections, the inspectors reviewed commitment completion forms, work orders (WOs), video inspection recordings, and visual examination reports to verify that the commitment was completed as described in the licensee correspondence and the NRC SER. The jet pump thermal sleeve weld TS-2 inspection; however, has not been completed as the technique has not been approved by the BWRVIP inspection committee. The inspector reviewed the licensee's

commitment completion forms, and verified that procedures and administrative controls were in place to perform the inspection or engineering evaluation once approved.

#### Commitment Item 15 – Open-Cycle Cooling Water System Program

This commitment specified that the licensee will enhance the open-cycle cooling water system program to perform confirmatory inspections of the residual heat removal service water pump pit supply piping, associated seismic restraints, and sluice gate valves prior to the PEO, and subsequently within 10 years after entering the PEO.

The inspectors reviewed commitment completion forms, and WOs to verify that the commitment was completed as described in the licensee correspondence, and the NRC SER.

#### Commitment Item 21 – Fire Water System Program

This commitment specified that prior to the PEO, the licensee would perform flow tests, or non-intrusive examinations, to identify evidence of loss of material due to corrosion prior to the PEO.

The inspectors reviewed commitment completion forms, WOs, and ultrasonic examination reports to verify that the commitment was completed as described in the licensee correspondence, and the NRC SER.

#### Commitment Item 25 – One-Time Inspection Program

This commitment specified that prior to the PEO, the licensee will perform a one-time inspection of ASME equivalent Class MC supports in a submerged environment of the Units 3 torus.

The inspectors reviewed commitment completion forms, and WOs to verify that the commitment was completed as described in the licensee correspondence, and the NRC SER.

#### Commitment Item 28 – ASME Code Section XI Subsection IWE Program

This commitment specified that prior to the period of extended operation that the licensee enhance ASME Section XI, Subsection IWE Program to perform a ultrasonic examination (UT) inspection of the sand bed area of the drywell liner.

The inspectors reviewed commitment completion forms, WOs, and UT reports to verify that the commitment was completed as described in the licensee correspondence, and the NRC SER.

#### Commitment Item 43 – Request for Additional Information RAI 2.1-2B

This commitment specified that prior to the PEO, the licensee would perform a design change to qualify 12 temperature switches installed in the steam tunnel portion of the

turbine building and ensure they will be protected from age-related degradation. Specifically, the licensee would make these circuits qualified for wetting and spray from a moderate/low energy line break.

The inspectors reviewed commitment completion forms, and WOs to verify that the commitment was completed as described in the licensee correspondence, and the NRC SER.

Commitment Item 46 – NRC Safety Evaluation Report, Open Item OI 2.4-3

This commitment specified that prior to the PEO, the licensee would perform one-time confirmatory ultrasonic thickness measurements on a portion of the cylindrical section of the drywell.

The inspectors reviewed commitment completion forms, WOs, and UT reports to verify that the commitment was completed as described in the licensee correspondence, and the NRC SER.

Review of Newly-Identified SSCs: This inspection requirement was completed during the Phase 2 implementation of inspection procedure (IP) 71003 (ADAMS Accession Number ML14171A125).

Descriptions of AMPs and Time-Limited Aging Analysis (TLAA) in the UFSAR Supplement: The review of the description of AMPs and TLAAs in the UFSAR supplement submitted pursuant 10 CFR 54.21(d) was completed during the Phase 2 implementation of IP 71003 (ADAMS Accession Number ML14171A125).

Review of License Renewal Commitment Changes: This inspection requirement was completed during the Phase 2 implementation of IP 71003 (ADAMS Accession Number ML14171A125).

b. Findings and Observations

No findings were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On March 11, 2016, the inspector presented the inspection results to Kevin Bronson, Senior Vice President, and other members of station staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

## **SUPPLEMENTARY INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee Personnel

E. Bates, Nuclear Licensing Engineer  
M. Acker, Licensing  
V. Schiavone, Engineering Programs

#### NRC

D. Dumbacher, Senior Resident Inspector  
T. Stephen, Resident Inspector  
A. Ruh, Resident Inspector

### **LIST OF DOCUMENTS REVIEWED**

#### Boiling Water Reactor Vessel Internals Program

3-TI-365, Unit-3 Technical Instruction, Reactor Pressure Vessel Internals Inspection (RPVII),  
Revision 12

51-9181235-000, Jet Pump Beam and Access Hole Cover Weld Examinations, 4/19/2012  
BWRVIP-41, BWR Jet Pump Assembly Inspection and Flaw Evaluation Guidelines, Revision 3

NCO 040006051, Commitment Completion Form, Implement the inspection of weld TS-2  
(BWRVIP-41), 7/13/2012

NCO 040006055, Commitment Completion Form, Inspect the Top Guide Beams, 7/13/2012

NCO 040006056, Enhance the Reactor Pressure Vessel Internals Inspection procedure to  
require visual inspection of the Access Hole Covers and AHC welds, 7/13/2012

#### Open-Cycle Cooling Water System Program

NCO 040006093, Commitment Completion Form, 12/4/2013

0-TI-562, RHRSW Pump Pit Inspection Recommendations, Revision 2

WO# 112999027, License Renewal Visual Inspection of the RHRSW Pump Pit Seismic  
Restraints, 8/26/2013

#### Fire Water System Program

NCO 040006050, Commitment Completion Form, Perform Flow Tests or Non-intrusive  
examinations to identify evidence of loss of material due to corrosion, 3/26/2013

0-SI-4.11.B.1.g, High Pressure Fire Protection System Flow Tests, Revision 32

0-SI-4.11.B.1.g(a), HPFPS Ring Header Flow Test, Revision 25

WO#113456951, License Renewal – Unit 3 Fire Protection Piping UT, 10/28/2012

#### One-Time Inspection Program

NCO 040006060, Commitment Completion Form, Perform a one-time inspection of the ASME  
equivalent Class MC supports in a submerged environment of the Torus, 9/6/2012

WO# 09-727605-00, License Renewal, Perform an inspection of 25 percent of the Class MC  
equivalent component supports in torus immersion area, 4/17/12

#### ASME Section XI Subsection IWE Program

3-TI-173, Primary Containment Inspection, Revision 9

NCO 040006088, Commitment Completion Form, Enhance ASME XI, Subsection IWE to perform a UT inspection of the sand bed area of the drywell liner, 11/28/2011

RAI 2.1-2, B

NCO 040006018, Commitment Completion Form, Perform Unit 3 DCN to qualify twelve temperature switches in the Turbine Building, 6/29/2012

Open Item OI 2.4-3

NCO 040006086, Commitment Completion Form, Perform one time confirmatory UT measurements on a portion of the cylindrical section of the drywell, 7/13/2012

WO# 07-714081-000, License Renewal One-Time UT Inspection of the Cylindrical section of the Drywell Liner, 4/22/2012

**LIST OF ACRONYMS**

AMPs	Aging Management Programs
BWRVIP	Boiling Water Reactors Vessel and Internals Project
IP	Inspection Procedure
PEO	Period of Extended Operation
SER	Safety Evaluation Report
SSCs	Systems, Structures, or Components
TLAA	Time-Limited Aging Analysis
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Examination
WOs	Work Orders