

August 14, 2008

Mr. William R. Campbell, Jr.
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT UNIT 1 - ISSUANCE OF AMENDMENT REGARDING IMPLEMENTATION OF THE BOILING-WATER REACTOR VESSEL AND INTERNALS PROJECT REACTOR PRESSURE VESSEL INTEGRATED SURVEILLANCE PROGRAM TO ADDRESS THE REQUIREMENTS OF APPENDIX H TO 10 CFR PART 50 (TAC NO. MD8386)

Dear Mr. Campbell:

The Commission has issued the enclosed Amendment No. 273 to Renewed Facility Operating License No. DPR-33 for the Browns Ferry Nuclear Plant, Unit 1. This amendment consists of changes to your Updated Final Safety Analysis Report in response to your application dated March 26, 2008, and modifies the basis for Tennessee Valley Authority's compliance with the requirements of Appendix H to Title 10 of the *Code of Federal Regulations* Part 50, "Reactor Vessel Material Surveillance Program Requirements."

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Eva A. Brown, 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. 273 to License No. DPR-33
2. Safety Evaluation

cc w/encls: See next page

August 14, 2008

Mr. William R. Campbell, Jr.
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT UNIT 1 — ISSUANCE OF AMENDMENT REGARDING IMPLEMENTATION OF THE BOILING-WATER REACTOR VESSEL AND INTERNALS PROJECT REACTOR PRESSURE VESSEL INTEGRATED SURVEILLANCE PROGRAM TO ADDRESS THE REQUIREMENTS OF APPENDIX H TO 10 CFR PART 50 (TAC NO. MD8386)

Dear Mr. Campbell:

The Commission has issued the enclosed Amendment No. 273 to Renewed Facility Operating License No. DPR-33 for the Browns Ferry Nuclear Plant, Unit 1. This amendment consists of changes to your Updated Final Safety Analysis Report in response to your application dated March 26, 2008, and modifies the basis for Tennessee Valley Authority's compliance with the requirements of Appendix H to Title 10 of the *Code of Federal Regulations* Part 50, "Reactor Vessel Material Surveillance Program Requirements."

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Eva A. Brown, 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. 273 to License No. DPR-33
2. Safety Evaluation

cc w/encls: See next page

Distribution

PUBLIC
LPL2-2 Reading
RidsNrrDorlLpl2-2
RidsNrrPMTOrf
RidsNrrDirstsb

RidsNrrPMEBrown
RidsNrrLABClayton
RidsOgcRp
RidsAcrcsAcnw&mMailCenter
GHill, OIS (2 Hard Copies)

RidsRgn2MailCenter
RidsNrrDorlDpr
MMitchell
SSheng

ADAMS Accession No.:ML081760567

OFFICE	LPLII-2/PM	LPLII-2/PM	LPLII-2/LA	ADES/ DCI/CVIB	ADES/ DCI/CVIB	OGC NOL	LPLII-2/BC
NAME	TOrf	EBrown	BClayton	SSheng *	MMitchell *	BMizuno	TBoyce
DATE	07/29/08	07/31/08	07/29/08	07/31/08	07/31/08	08/11/08	08/14/08

* per memo from MMitchell to TBoyce

TENNESSE VALLEY AUTHORITY

DOCKET NO. 50-259

BROWNS FERRY NUCLEAR PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 273
Renewed License No. DPR-33

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (the licensee) dated March 26, 2008, complies with the standards and requirements of the Atomic Energy Act of 1952, 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, by Amendment No. 273, Renewed Facility Operating License No. DPR-33 is hereby amended to authorize the change to the Updated Final Safety Analysis Report (FSAR) as requested by letter dated March 26, 2008, and evaluated in the associated safety evaluation by the Commission's Office of Nuclear Reactor Regulation. The licensee shall submit the update of the FSAR authorized by this amendment in accordance with 10 CFR 50.71(e). Also, as indicated in the attachment to this license amendment, paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-33 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 273, are hereby incorporated in the license. Tennessee Valley Authority 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 of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Thomas H. Boyce, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Change to Operating License

Date of Issuance: August 14, 2008

ATTACHMENT TO LICENSE AMENDMENT NO. 273
TO RENEWED FACILITY OPERATING LICENSE NO. DPR-33
DOCKET NO. 50-259

Replace Page 3 of Renewed Operating License DPR-33 with the attached Page 3.

- (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. 273, 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.

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 273

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-33

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-259

1.0 INTRODUCTION

By letter dated March 26, 2008, Tennessee Valley Authority (TVA), the licensee for Browns Ferry Nuclear Plant (BFN), Unit 1, submitted a request for U.S. Nuclear Regulatory Commission (NRC) review and approval of a license amendment consisting of changes to the Updated Final Safety Analysis Report (UFSAR) to reflect modification of BFN Unit 1 basis for its compliance with the requirements of Appendix H to Title 10 of the *Code of Federal Regulations* Part 50 (10 CFR Part 50), "Reactor Vessel Material Surveillance Program Requirements." In the submittal, TVA requested that it be approved to implement the Boiling Water Reactor Vessel and Internals Project (BWRVIP) reactor pressure vessel (RPV) integrated surveillance program (ISP) as the basis for demonstrating the compliance of BFN, Unit 1 with the requirements of Appendix H to 10 CFR Part 50.

2.0 REGULATORY EVALUATION

Nuclear power plant licensees are required by Appendix H to 10 CFR Part 50 to implement RPV surveillance programs to "monitor changes in the fracture toughness properties of ferritic materials in the reactor vessel beltline region . . . which result from exposure of these materials to neutron irradiation and the thermal environment." Two specific alternatives are provided with regard to the design of a facility's RPV surveillance program which may be used to address the requirements of Appendix H to 10 CFR Part 50.

The first alternative is the implementation of a plant-specific RPV surveillance program consistent with the requirements of American Society for Testing and Materials (ASTM) Standard Practice E 185, "Standard Practice for Conduction Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels." In the design of a plant-specific RPV surveillance program, a licensee may use the edition of ASTM Standard Practice E 185, which was current on the issue date of the American Society of Mechanical Engineers Code to which the reactor vessel was purchased, or later editions through the 1982 edition.

The second alternative provided in Appendix H to 10 CFR Part 50 is the implementation of an ISP. An ISP is defined in Appendix H to 10 CFR Part 50 as occurring when, "the representative materials chosen for surveillance for a reactor are irradiated in one or more other reactors that

have similar design and operating features.” Five specific criteria are stated in Appendix H to 10 CFR Part 50 that must be met to support approval of an ISP:

- a. The reactor in which the materials will be irradiated and the reactor for which the materials are being irradiated must have sufficiently similar design and operating features to permit accurate comparisons of the predicted amount of radiation damage.
- b. Each reactor must have an adequate dosimetry program.
- c. There must be adequate arrangement for data sharing between plants.
- d. There must be a contingency plan to assure that the surveillance program for each reactor will not be jeopardized by operation at reduced power level or by an extended outage of another reactor from which data are expected.
- e. There must be substantial advantages to be gained, such as reduced power outages or reduced personnel exposure to radiation, as a direct result of not requiring surveillance capsules in all reactors in the set.

The BWRVIP RPV ISP was submitted for NRC staff review and approval in topical reports BWRVIP-78, “BWR Vessel and Internals Project, BWR Integrated Surveillance Program Plan,” and BWRVIP-86, “BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan.” The NRC staff approved the proposed BWRVIP ISP in a safety evaluation (SE) dated February 1, 2002, with requirements that certain plant-specific information be provided by BWR licensees who wish to implement the BWRVIP ISP for their facilities. BFN, Unit 1 was not included in these two BWRVIP reports. However, as part of the NRC review of BWRVIP-116, “BWR Vessel and Internals Project, Integrated Surveillance Program (ISP) Implementation for License Renewal [ISP(E)] (BWRVIP-116),” the NRC staff evaluated and accepted the individual vessel information provided by the BWRVIP regarding BFN, Unit 1, including the final selection of its best representative weld and plate materials using the methodology and criteria previously established in BWRVIP-86-A. Subsequently, the BWRVIP agreed to add this individual vessel evaluation as Appendix A to BWRVIP-86-A to provide a complete list of the evaluations of all BWR vessels in the ISP and the proposed ISP(E). As such, the NRC staff considers that BFN, Unit 1 is covered by BWRVIP-78 and BWRVIP-86-A for the BWRVIP ISP and by BWRVIP-116 for the BWRVIP ISP(E). TVA’s March 26, 2008, submittal addressed the NRC requirements stated in the February 1, 2002, BWRVIP ISP SE.

In this SE, all of the criteria cited above for approval of an ISP were addressed either completely or partially. For criteria that could not be fully addressed in the SE, plant-specific information was required. The NRC staff identified in the SE the specific information that would be required from licensees who wished to implement the BWRVIP for their facilities. As stated in the SE:

[L]icensees who wish to participate in the BWR ISP must provide, for NRC staff review and approval, information which defines how they will determine RPV and/or surveillance capsule fluences based on the dosimetry data which will be available for their facilities. This information must be submitted concurrently with each licensee’s submittal to replace their existing plant-specific surveillance

program with the BWR ISP as part of their facility's licensing basis. The information submitted must be sufficient for the staff to determine that:

(1) RPV and surveillance capsule fluences will be established based on the use of an NRC approved fluence methodology that will provide acceptable results based on the available dosimetry data,

(2) if one methodology is used to determine the neutron fluence values for a licensee's RPV and one or more different methodologies are used to establish the neutron fluence values for the ISP surveillance capsules which "represent" that RPV in the ISP, the results of these differing methodologies are compatible (i.e., within acceptable levels of uncertainty for each calculation).

This plant-specific information, which was repeated in a slightly different fashion in the February 24, 2006, SE on BWRVIP-116, was required by the NRC staff to ensure that criterion (b.) for an ISP from Appendix H to 10 CFR Part 50 could be met by each facility and to confirm that data which would be shared as part of the BWRVIP ISP could be effectively utilized by each licensee for the monitoring of RPV embrittlement for their facility. The SE further states that, for plants that had already received approval to implement the ISP in accordance with BWRVIP-86-A, implementation of the ISP(E) in accordance with the BWRVIP-116 report may be processed using 10 CFR 50.59.

3.0 TECHNICAL EVALUATION

In the March 26, 2008, letter, TVA submitted information for BFN, Unit 1 that addressed the information requested in the NRC staff's February 1, 2002, BWRVIP ISP SE. The submittal indicated that the current pressure-temperature (P-T) limit curves (SE dated July 26, 2006) are based on an approved fluence methodology documented in NEDO-32983-A, "GE Methodology for Reactor Pressure Vessel Fast Neutron Flux Evaluations," dated December 2001. The NRC staff also found that the same fluence methodology was used in calculating the fluence values reported in the approved license renewal application for BFN, Units 1, 2, and 3. In the current application, TVA provided a revised page 4.2-16 of the BFN UFSAR in Enclosure 2 to the submittal stating:

Revisions to fluence calculations using data obtained from the surveillance capsule specimens will use an NRC approved methodology that meets Regulatory Guide 1.190.

The NRC staff concludes that the statement mentioned above in the BFN UFSAR is sufficient to address both items (1) and (2) from the February 1, 2002, SE. Regarding item (1), the licensee's use of an NRC-approved methodology which is consistent with the attributes of Regulatory Guide (RG) 1.190, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence," for determining the BFN, Unit 1 RPV neutron fluence value is acceptable. Regarding item (2), the licensee's use of an NRC-approved methodology which is consistent with the attributes of RG 1.190 for determining the fluences of RPV surveillance capsules tested under the BWRVIP ISP is also acceptable. The NRC staff has concluded that any two (or more) approved fluence methodologies provide "compatible" results if the values are within each other's uncertainty bound.

As mentioned earlier, TVA already performed an updated RPV fluence analysis using the NRC-approved methodology in support of its current P-T limit curves for the BFN, Unit 1 RPV.

Inasmuch as this action was submitted as a license amendment, consistent with the decision given in Commission Memorandum and Order CLI-96-13 regarding RPV capsule withdrawal schedule and whether an NRC approval constitutes a license amendment, TVA provided revised language for page 4.2-16 of the BFN UFSAR which documented the licensee's incorporation of the BWRVIP ISP into the BFN, Unit 1 licensing basis:

For Units 1, 2, and 3, Integrated Surveillance Program (ISP) implementation and surveillance specimen schedule withdrawal and testing for the initial BWR 40-year operating period is governed and controlled by BWRVIP-86-A (Updated BWR Integrated Surveillance Program (ISP) Implementation Plan), and the NRC's Safety Evaluation dated February 1, 2002. Surveillance specimen schedule withdrawal and testing during the license renewal period is governed and controlled by BWRVIP-116 (Integrated Surveillance Program (ISP) Implementation For License Renewal), and the BWRVIP response to NRC RAIs [requests for additional information] dated January 11, 2005.

The NRC staff has concluded that the information provided in the revised BFN UFSAR is adequate to document the licensee's intent to appropriately implement the BWRVIP ISP as the method for demonstrating the compliance of BFN, Unit 1 with the requirements of Appendix H to 10 CFR Part 50. For completeness, the licensee also revised BFN UFSAR by referencing BWRVIP-116 for all three BFN units, a change accomplished in accordance with the 10 CFR 50.59 process.

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 installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. 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 had previously issued a proposed finding that the amendment involves no significant hazards consideration, and there have been no public comment on such finding (73 FR 31723). 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 needs be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The NRC staff concludes that the information provided by TVA is sufficient to conclude that the BWRVIP ISP, as approved in the February 1, 2002, SE, can be implemented for BFN, Unit 1 as

the basis for demonstrating the facility's continued compliance with the requirements of Appendix H to 10 CFR Part 50. As part of the implementation and documentation of the licensee's intent to utilize the BWRVIP ISP for this purpose, the licensee shall modify the BFN UFSAR as noted in Section 3.0 of this SE and as stated in their March 26, 2008, submittal.

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 operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Simon Sheng

Date: August 14, 2008

Tennessee Valley Authority

cc:

Mr. Ashok S. Bhatnagar
Senior Vice President
Nuclear Generation Development
and Construction
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Vice President
Nuclear Support
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mr. Michael J. Lorek
Vice President
Nuclear Engineering & Projects
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mr. D. Tony Langley, Manager
Licensing and Industry Affairs
Browns Ferry Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Decatur, AL 35609

General Counsel
Tennessee Valley Authority
6A West Tower
400 West Summit Hill Drive
Knoxville, TN 37902

Mr. John C. Fornicola, General Manager
Nuclear Assurance
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

BROWNS FERRY NUCLEAR PLANT

Mr. R. G. (Rusty) West
Site Vice President
Browns Ferry Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Decatur, AL 35609

Ms. Beth A. Wetzel, Manager
Corporate Nuclear Licensing
and Industry Affairs
Tennessee Valley Authority
4K Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mr. James E. Emens, Jr.
Supervisor, Nuclear Site Licensing
Browns Ferry Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Decatur, AL 35609

James B. Baptist
Browns Ferry Senior Project Engineer
Division of Reactor Projects, Branch 6
U.S. Nuclear Regulatory Commission
61 Forsyth Street, SW.
Suite 24T85
Atlanta, GA 30303-8931

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
Browns Ferry Nuclear Plant
10833 Shaw Road
Athens, AL 35611-6970

State Health Officer
Alabama Dept. of Public Health
RSA Tower - Administration
Suite 1552
P.O. Box 303017
Montgomery, AL 36130-3017

Tennessee Valley Authority

BROWNS FERRY NUCLEAR PLANT

Chairman
Limestone County Commission
310 West Washington Street
Athens, AL 35611

Mr. Larry E. Nicholson, General Manager
Performance Improvement
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mr. Michael A. Purcell
Senior Licensing Manager
Nuclear Power Group
Tennessee Valley Authority
4K Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801