

April 2, 2001

Mr. J. A. Scalice
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
6A Lookout Place
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Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT UNIT 2 - ISSUANCE OF AMENDMENT
REGARDING REACTOR PRESSURE VESSEL MATERIAL SURVEILLANCE
CAPSULE REMOVAL SCHEDULE (TAC NO. MB0741)

Dear Mr. Scalice:

The Commission has issued the enclosed Amendment No. 271 to Facility Operating License No. DPR-52 for the Browns Ferry Nuclear Plant, Unit 2. This amendment is in response to your application dated February 5, 2001 (TS-413). It approves a change to your Title 10, *Code of Federal Regulations*, Part 50, Appendix H, Reactor Vessel Material Surveillance Program. Under the terms of the program that was approved by our letter of August 3, 1989, you would be required to remove the second capsule during the current Cycle 11 outage. This amendment authorizes a one cycle delay in removal of the second capsule.

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

Sincerely,

/RA/

William O. Long, Senior Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-260

Enclosures: 1. Amendment No. 271 to
License No. DPR-52
2. Safety Evaluation

cc w/enclosures: See next page

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TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-260

BROWNS FERRY NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 271
License No. DPR-52

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (the licensee) dated February 5, 2001, 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 licensee is authorized to delay the removal of the second reactor vessel material surveillance capsule until the Cycle 12 outage. (No text changes to the operating license or its appendices are involved.)
3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Richard P. Correia, Chief, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Date of Issuance: April 2, 2001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 271 TO FACILITY OPERATING LICENSE NO. DPR-52
TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT, UNIT 2
DOCKET NO. 50-260

1.0 INTRODUCTION

By letter dated February 5, 2000 (Ref. 1), Tennessee Valley Authority (TVA) submitted a request for U.S. Nuclear Regulatory Commission (NRC) review and approval of an exigent license amendment request to modify the Browns Ferry Nuclear Plant, Unit 2 reactor pressure vessel (RPV) surveillance capsule withdrawal schedule. The February 5, 2001 submittal was made to revise an earlier January 16, 2001 request (Ref. 2), converting it to an operating license amendment application.

The proposed change would modify the date of withdrawal of the next Browns Ferry Unit 2 surveillance capsule from a calendar date equivalent to approximately 14 effective full-power years (EFPY) of operation to a calendar date equivalent to approximately 16 EFPY of operation to coincide with the Browns Ferry Unit 2 Cycle 12 refueling outage planned for March 2003. TVA's submittal was made in accordance with the provision of Appendix H to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, paragraph B.3 which specifies that "[a] proposed withdrawal schedule must be submitted with a technical justification as specified in [10 CFR 50.4]. The proposed schedule must be approved prior to implementation."

2.0 BACKGROUND

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." Regarding RPV surveillance program design and specimen testing, Appendix H to 10 CFR Part 50 incorporates by reference the editions of the American Society for Testing and Materials (ASTM) Standard Practice E 185, "Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels," through the 1982 edition. Under Appendix H to 10 CFR Part 50, the licensee's RPV surveillance program design and withdrawal schedule is required to meet the requirements of the edition of ASTM E 185 that is current on the issue date of the American Society of Mechanical Engineers Code to which the RPV was purchased, although later editions may be used, up to and including the 1982 edition. The test procedures and reporting requirements must, however, meet the requirements of the 1982 edition of ASTM E 185, to the extent practical for the configuration of the specimens in the capsules.

The original edition of ASTM E 185 to which the Browns Ferry Unit 2 RPV surveillance program was designed was the 1966 edition (ASTM E 185-66). However, subsequent licensing actions by TVA resulted in the use of the 1982 edition of ASTM E 185, as recorded in the facility's Final

Safety Analysis Report, as the standard of record for the Browns Ferry Unit 2 surveillance program withdrawal schedule's compliance with Appendix H to 10 CFR Part 50. This change to incorporate the 1982 edition of ASTM E 185 into the Browns Ferry Unit 2 licensing basis was specifically discussed with, and confirmed by, TVA during a January 19, 2001, telecon between the NRC staff and TVA.

The 1982 edition of ASTM E 185 sets forth specific requirements regarding the withdrawal schedule for RPV surveillance capsule programs. For programs like that of Browns Ferry Unit 2 in which the projected Charpy V-notch transition temperature shift at the inside surface of the RPV is projected to be less than or equal to 100 °F, three surveillance capsules are required. The second surveillance capsule in the withdrawal sequence is required to be withdrawn at 15 EFPY of operation, or at a time when the accumulated neutron fluence of the capsule corresponds to the approximate end-of-life fluence at the RPV inner wall location, whichever comes first. Hence, at the latest, the second Browns Ferry Unit 2 capsule must be removed and tested prior to the completion of 15 EFPY of operation for the facility's surveillance program to remain within the requirement of the 1982 edition of ASTM E 185.

In Commission Memorandum and Order CLI-96-13 (Ref. 3), a decision regarding the status of the Perry Nuclear Power Plant Unit 1 RPV surveillance program, the Commission indicated that a licensee request to modify a facility's surveillance capsule withdrawal schedule such that it no longer meets the requirements of the edition of ASTM E 185 incorporated into the facility's licensing basis for the purpose of complying with Appendix H to 10 CFR Part 50, requires a license amendment.

Additional NRC staff guidance has been published regarding licensee requests to obtain one cycle capsule withdrawal deferrals to support the Integrated Surveillance Program (ISP) proposed by the Boiling Water Reactor Vessel and Internals Project (BWRVIP). The ISP withdrawal schedule proposed by the BWRVIP was originally submitted in topical report BWRVIP-78 (Ref. 4) and was subsequently updated in topical report BWRVIP-86 (Ref. 5). The ISP was designed to integrate and share data from the surveillance programs from all existing BWR reactors in the United States. The BWRVIP noted that, for some licensees, it would be necessary to obtain at least one cycle capsule deferrals to support obtaining high-quality data from some existing surveillance capsules. In addition, since some existing surveillance capsules would not need to be tested if the ISP were approved by the staff, licensees having such capsules desired to seek deferral of their removal and testing to reduce monetary expenditures and personnel exposure. The NRC staff has noted its general support for the ISP proposal, and, by letter to the BWRVIP, dated May 16, 2000 (Ref. 6), identified criteria to be addressed by licensees requesting one cycle capsule deferrals to support the ISP.

The first criterion addressed in the staff's May 16, 2000, letter requested that licensees explain how their deferral request is consistent with the ISP plan submitted in topical report BWRVIP-78. Principally, this requested that licensees examine how their surveillance capsules would be used (or not used) under the proposed ISP and confirm that their request for a one cycle deferral would not affect the ability of the ISP to meet its objectives. The second criterion requested that licensees provide a justification as to why the materials property data to be acquired from the capsule in question was not necessary to support safe operation of the facility over the period of the deferral. Several options were given in the staff's letter regarding possible responses to this criterion. Finally, the staff's third and final criterion requested that

licensees explain why the dosimetry data to be acquired from the capsule in question was not necessary to support safe operation of the facility over the period of the deferral.

3.0 DISCUSSION

In its February 5, 2001, license amendment submittal, TVA stated that their reason for requesting this deferral of the second Browns Ferry Unit 2 surveillance capsule was to support their involvement in the ISP. TVA then addressed, as described below, the three criteria cited in the NRC staff's May 16, 2000, letter.

Regarding the first criterion, TVA noted that according to the scope of the ISP discussed in a response from the BWRVIP, dated December 15, 2000 (Ref. 7), to an NRC staff request for additional information, the surveillance capsules for Browns Ferry Unit 2 were to be included in the ISP. In addition, TVA noted that the ISP schedule in the BWRVIP-86 report suggested that the next Browns Ferry Unit 2 capsule should be withdrawn after 20 EFPY of operation. Thus, the licensee concluded that deferral of the second Browns Ferry Unit 2 capsule would be consistent with the objectives of the BWRVIP's proposed ISP.

To address the second criterion, TVA noted that the material test data from the capsule to be deferred was not necessary to ensure continued safe operation of the Browns Ferry Unit 2 RPV. Referencing Figures 3-1 and 3-2 from report SIR-00-165 which was provided to the staff in the initial TVA submittal on January 16, 2001, TVA noted that using the predictive models of NRC Regulatory Guide 1.99, Revision 2 (RG 1.99, Rev. 2), the surveillance weld and surveillance plate for Browns Ferry Unit 2 were predicted to exhibit 30 °F and 23 °F of Charpy V-notch transition temperature shift at 18 EFPY (this value was referenced in January 16, 2001, submittal since TVA initially requested a two-cycle deferral). Shifts of this magnitude are not predicted to be large enough to be distinguishable from the scatter in the Charpy test method (56 °F and 34 °F for welds and plates, respectively) and, hence, of limited value in assessing the embrittlement state of the RPV.

Finally, regarding the third criterion, TVA concluded that the dosimetry information from the capsules to be deferred was not necessary to ensure continued safe operation of the Browns Ferry Unit 2 RPVs. TVA noted that the operating time for the Browns Ferry Unit 2 RPV at the end of the proposed deferral period will be 16 EFPY. Since the current Browns Ferry Unit 2 pressure and temperature (P-T) limits were approved through 16 EFPY, TVA concluded that this indicates that the deferral will not impact their adequacy.

For these reasons, TVA concluded that their request to defer withdrawal of the second Browns Ferry Unit 2 surveillance capsule was justified and consistent with their intent to support the BWRVIP ISP.

4.0 STAFF EVALUATION

The staff reviewed the licensee's February 5, 2001 application using the criteria cited in the aforementioned May 16, 2000 letter. The staff's conclusions on the technical justifications provided in response to the three criteria given in the May 16, 2000, letter are stated below.

First, the staff accepts that deferral of the second Browns Ferry Unit 2 capsule is acceptable within the BWRVIP ISP plan. The licensee's request to defer the second capsule for withdrawal at 16 EFPY until such time as NRC staff has completed its review of the proposed ISP is acceptable since the requested deferral does not exceed the 20 EFPY withdrawal date specified in the ISP.

Second, the staff accepts the justification provided by the licensee in response to why the material property information from the second surveillance capsule is not necessary to support safe operation of the Browns Ferry Unit 2 RPV during the period of deferral. When data from a capsule is not expected to be distinguishable from the scatter in the Charpy test method, this constitutes an acceptable technical justification for capsule deferral inasmuch as the data would not be expected to provide information which would support a modification to the assessment of the embrittlement of the RPV. Hence, continued operation of the RPV based on the use of P-T limit curves developed from the application of the generic embrittlement models given in RG 1.99, Rev. 2, as is the case with Browns Ferry Unit 2, is acceptable through the period of the deferral.

Finally, regarding the third criterion, the staff finds that since the existing Browns Ferry Unit 2 P-T limit curves have been found to be acceptable for up to 16 EFPY of operation, TVA is justified in operating the Browns Ferry Unit 2 RPV through the requested period of capsule deferral without the need to acquire the dosimetry data from the second Browns Ferry Unit 2 capsule.

5.0 REQUEST FOR EXIGENT PROCESSING

The licensee initially requested approval of the surveillance capsule withdrawal schedule change in a letter dated January 16, 2001. The staff reviewed the request to determine if it was within the scope of NRC Administrative Letter 97-04. Administrative Letter 97-04 informed licensees that, as a result of CLI-96-13, certain withdrawal schedule changes may need to be processed as amendments. Based on CLI-96-13, the staff determined that the licensee's requested modification to the surveillance capsule withdrawal schedule required a license amendment. The staff advised the licensee of its finding on January 25, 2001. By application dated February 5, 2001, the licensee resubmitted its request as a license amendment.

The licensee's February 5, 2001 application indicates that exigent circumstances exist, and, requests approval by April 3, 2001. On February 28, 2001, the staff published an exigent notice concerning the amendment that only provided a 2-week comment period (66 FR 12818), based on the licensee's proposed outage shutdown date of March 18, 2001. However, processing under the exigency provisions of 10 CFR Part 50, Section 50.91(a)(6) is unnecessary and this amendment will be issued after a 30-day comment period.

6.0 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.

7.0 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 has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (66 FR 12818). 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.

8.0 CONCLUSION

The proposed amendment would modify the time of withdrawal of the second surveillance capsule until 16 EFPY of operation, corresponding with the Browns Ferry Unit 2 Cycle 12 refueling outage planned for March 2003. The NRC staff has concluded that this deferral of the withdrawal of the second surveillance capsule for one cycle is acceptable. Based on the considerations discussed in this safety evaluation, there is reasonable assurance that (1) 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

9.0 REFERENCES

1. T. E. Abney (TVA) to NRC Document Control Desk, "Browns Ferry Nuclear Plant (BFN) - Unit 2 - Proposed Revision to the Unit 2 Reactor Pressure Vessel (RPV) Material Surveillance Program - Supplemental Information and Request for Exigent License Amendment - TAC No. MB0741," February 5, 2001.
2. T. E. Abney (TVA) to NRC Document Control Desk, "Browns Ferry Nuclear Plant (BFN) - Proposed Revision to the Unit 2 Reactor Pressure Vessel (RPV) Material Surveillance Program - TAC No. MB0741," January 16, 2001.
3. Commission Memorandum and Order CLI-96-13, In the Matter of The Cleveland Electric Illuminating Company (Perry Nuclear Power Plant Unit 1), served December 6, 1996.
4. Topical Report BWRVIP-78, "BWR Vessel and Internals Project, BWR Integrated Surveillance Program Plan (BWRVIP-78)," December 1999.
5. Topical Report BWRVIP-86, "BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan," December 2000.
6. J. R. Strosnider (NRC) to C. Terry (BWRVIP), "BWR Integrated Surveillance Program (BWRVIP-78) (TAC No. M99894)," May 16, 2000.

7. C. Terry (BWRVIP) to NRC Document Control Desk, "Project No. 704 - BWRVIP Response to NRC Request for Additional Information Regarding BWRVIP-78," December 15, 2000.

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Date: April 2, 2001

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BROWNS FERRY NUCLEAR PLANT

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